

SAAB J21-A

This WWI Swedish fighter adds
a refreshing twist to military Stand-Off Scale.
by Fred Angel



Maybe those tall, leggy, blonde Swedes in *Playboy* got to me. Maybe it was because I really couldn't pronounce that name with my New England twang. Maybe it was the raised eyebrows and the cynical sneers when I suggested the project to my flying buddies. Whatever the reasons, I just had to build that Saab. The three-views of this unusual fighter kept flashing through my mind.

"Three-views flashing in a near vacuum is a sight to behold and a joy forever!" my wife said.

Finally, after weeks of muttering words like "pusher" and "twin booms" and "I wonder if..." my kids dragged me to the workshop and barred the door with: "Now, build the thing!"

As I started to lay out the aircraft, it became obvious why it had so much appeal. Man, it had "class." Take a pusher-fighter with rakish lines, a generous wing and tail area, a trike gear and twin booms, add clean scale details and a simple color scheme, and you have a stand-off ship that is sure to give you a chance at any contest. Or, if you're not ready for the contest scene just yet, make a

low flying pass at the local field and then brace yourself for those long, leggy, sweet things high-stepping out of those racy sports cars.

The remarkable thing about this model was that, ready to fly, the weight was only four and one-half pounds! Test flights convinced me that a slightly smaller version would fly equally well on less power. Consequently, the plans offer an option of wing sizes and power choices. The larger version flew cleanly with an Enya 45 and a Tornado 10 x 6 pusher prop. The smaller version, which was thrown together in a hurry with no attempt at beauty, did just as well on a 35 and a Grish three-blade pusher.

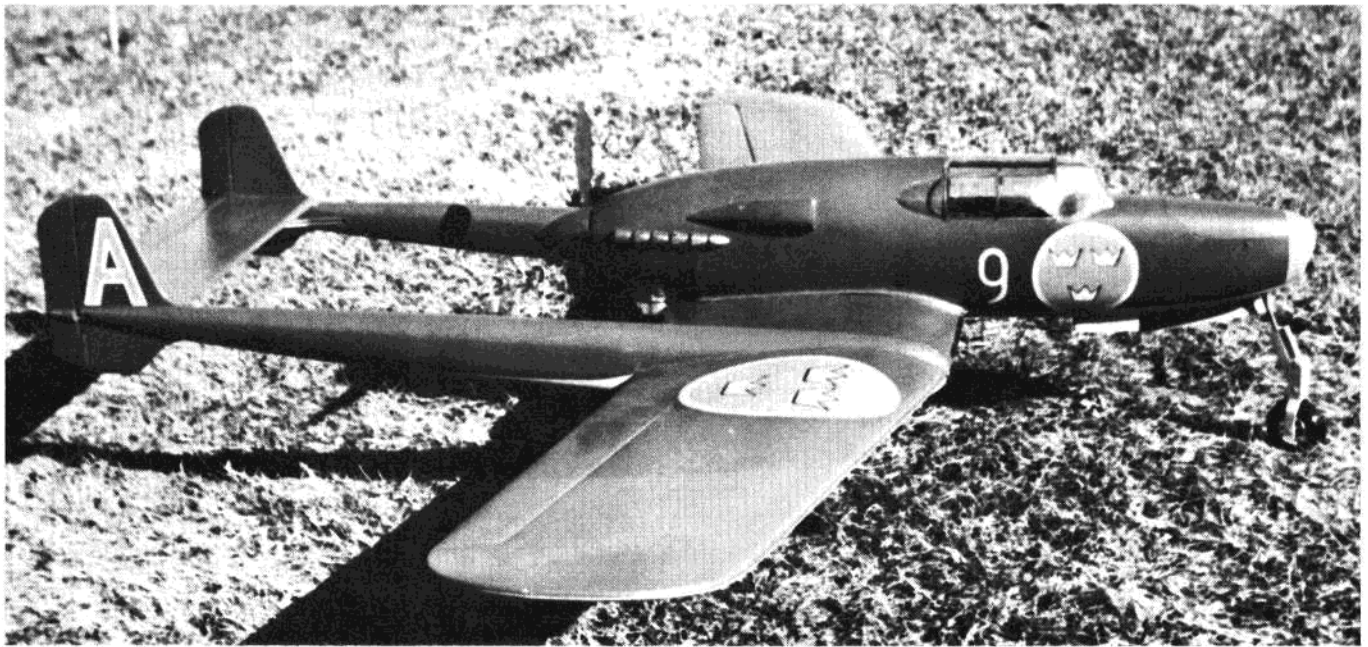
O.K., let's build. Carefully select your balsa for building and try to keep the tail light. To achieve the correct balance, it was necessary to fly with the landing light batteries and three ounces of weight in the nose. Don't worry about adding weight, the large wing area can take it.

Get a copy of *Profile Publications No. 138* for reference. With that tacked up on the wall, the plans laid out in front of you, and a peanut butter and

jelly sandwich at your elbow, you're all set to start with the fuselage. Cut out a matching pair of 1/8" medium-hard balsa splines as shown on the top view, and cut out all formers. Also cut the top and bottom keels from 1/16" plywood. Mark the former positions on the keels, splines, and the maple motor mounts. Mix up a batch of epoxy, and glue formers F-3 through F-6 to the motor mounts. This will give you a crutch, on which to support the splines and top keel.

After the epoxy sets up, white glue the splines and the top keel. Then add formers F-1, F-2, and the bottom keel. When everything is dry, you can plank or sheet the framework. If you are adept at planking, do it! I've found that it is just as easy to sheet compound curves using the following technique.

Select a "bendable" sheet of 3/32" balsa, spray with hot water, and glue to formers F-1, 2, and 3, and along the side splines. Note that the glue joint on F-1 stops just under the side canopy. Hold in place with masking tape and pins. Now cut a "V" in the top of the sheet from F-3 to F-5, and start shaping the



An apt subject for Stand-Off Scale, the Saab has pleasing lines and above average flight capabilities. The J21 would be an excellent choice for a first sport scale project.

sheet down to the curve of the formers with your fingers. By cutting and fitting, you'll be able to form the sheeting into a neat curve.

When satisfied with the fit, coat the formers with glue and tape the sheet to them. Don't worry about any gaps where the sheeting meets. This can be filled in as described later. Now add a few scrap strips to the bottom of the splines and do the bottom section. Next, rough-cut the nose and top cowl blocks to shape and spot-glue in place. Grab your razor plane and a mess of sandpaper, and sand to shape. Carefully remove the blocks after sanding.

Before hollowing out the top cowl, use this to prepare a mold for the bottom cowl. Stretch a piece of rubber balloon over the block and thumb-tack to the bottom. Next, coat the surface with Vaseline or wax. Steal a shoe box from what's-her-name's closet and glue in a divider, so that you'll have a compartment with about an inch or two all around the cowl. Then place the waxed cowl (bottom down) in the compartment, and screw in place through the bottom of the box. Make sure that the back side of the cowl is against one end of the box, so that you'll have a form that is easy to lay-up.

Now mix a batch of plaster of paris and pour it over the plug. When set, rip off the box, remove the plug, and lay-up your fiberglass. Hollow out the cowl block and nose blocks, and mount in place. Be sure to fit the engine and install the mounting nuts before securing the cowl.

All that's really left is the installation of the nose gear plate, the strips for attaching the bottom cowl, the wing attachment block, and the hatch detail.

Now that the old body is taking shape (no pun intended) and your enthusiasm is building up, let's form the canopy. Shape the forward canopy and

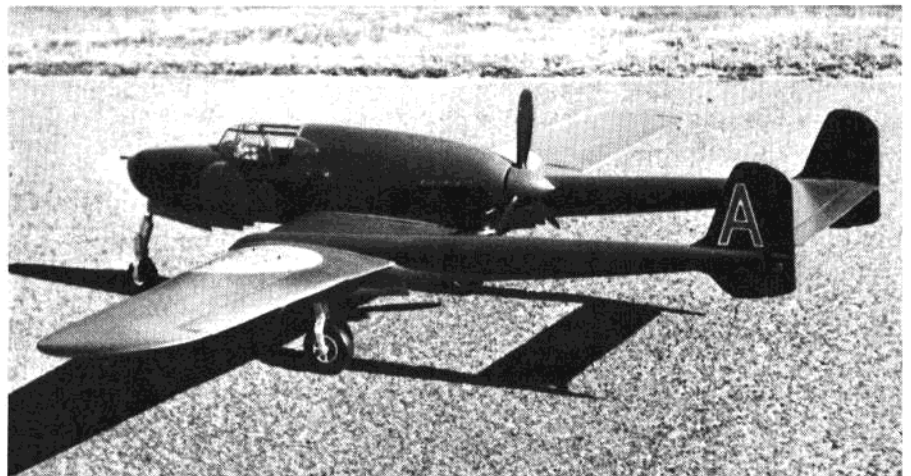
the two side canopy forms from balsa or pine. If you carefully cut the section of sheeting from F-1 to F-2 at the point just below the bottom of the side canopies and glue in a couple of end pieces, you'll have the top canopy form all set to go. Glue in some scrap supports to elevate the forms and clamp the pieces to your kitchen table. Then, using heat-forming canopy plastic and an oven, you can pull the material over the forms. For those of you who haven't tried this before, it is simply a matter of laying a sheet of clear plastic on a tin-foil covered cookie sheet, and broiling in the oven for a few seconds. Waste a scrap piece first to get the feel of the material, and wear gloves or you really will! You will need an extra pair of hands to make sure the plastic is stretched evenly down over your forms.

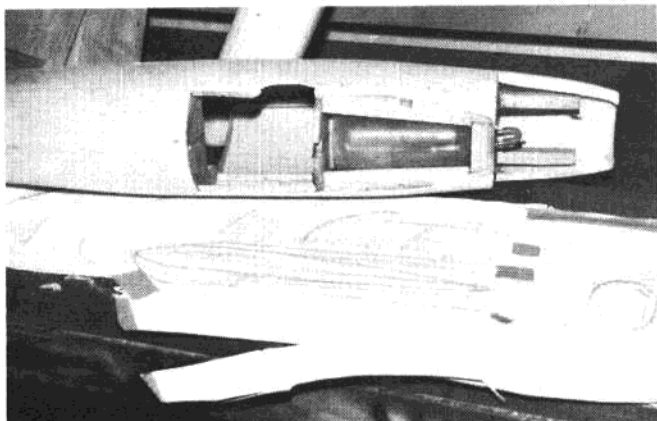
The wing is a three-piece unit, with dihedral in the outer panels only. Build the center section first. Pin down the $1/4 \times 3/8$ " center spars and glue in the top half-ribs as shown. When dry, remove from the board, turn over and glue in the bottom half-ribs. Glue the shaped trailing edge strip in place. Next, cut the front of the ribs to the angle shown, and glue in the $1/8 \times 3/4$ " lead-

ing edge strip. Install the hold-down block, the landing gear blocks, plywood reinforcement, and the dihedral braces. Prepare a long sanding strip by contact cementing sandpaper to a strip of pine or bass, and contour the nose of the ribs to meet the $1/8$ " strip.

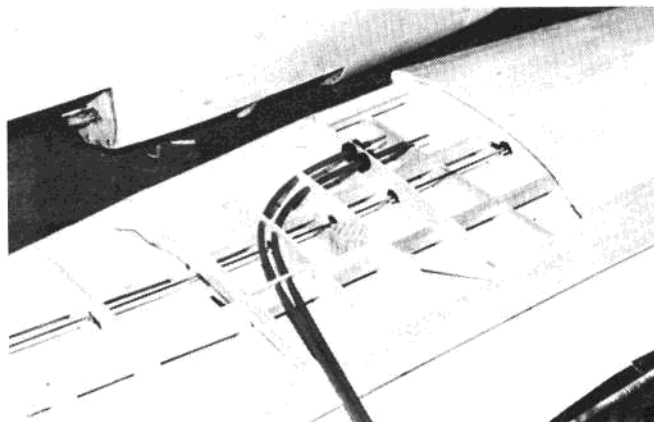
Build the outer panels in the same manner. The ribs between the center rib and the end rib are rough-cut over-size. When you use the long sanding strip to form the taper, you'll end up with an accurately contoured framework that will receive the sheet covering uniformly. Join the panels to the center section and install the aileron linkage, pushrod, and the Nyrods. Sheet the wing with $3/32$ " stock, install the shaped leading edge and wing tips, then sand smooth.

The booms are made from medium-soft stock and shaped as shown. After sanding, trace an outline of the rib at the dihedral joint onto the booms, and cut out. Cut down through the top of each boom to the trailing edge point and remove this section. Now lay a piece of sandpaper face up on the bottom of the wing and slide the booms back and forth until they match the wing. Draw a centerline on the top and bottom of each boom.

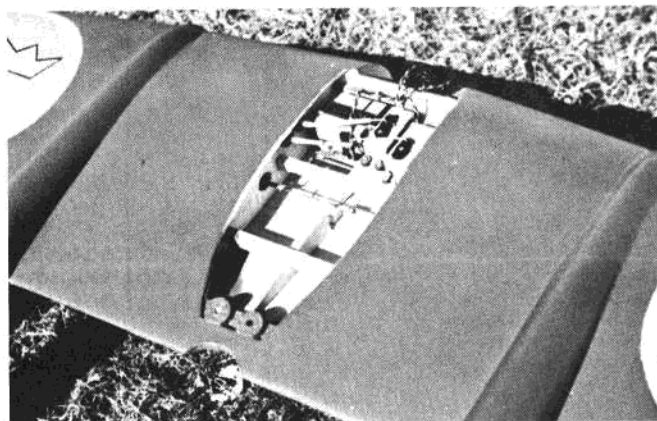




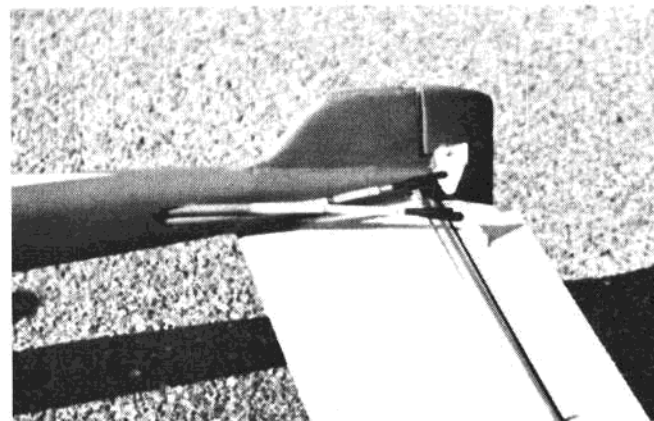
The fuselage "pod" houses the engine, tank, receiver, batteries and throttle servo. There is plenty of room for all components.



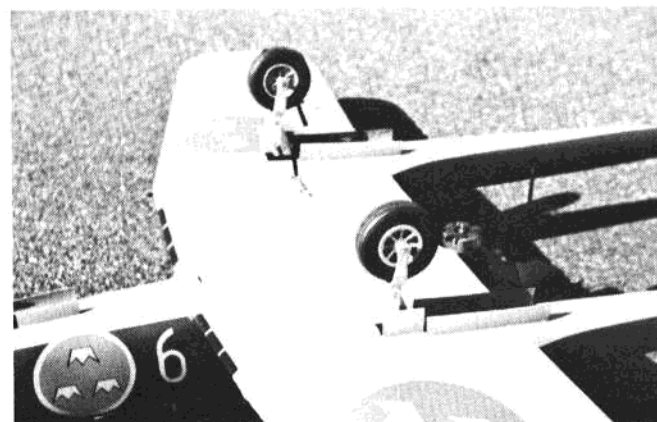
The Nyrod runs for the elevator and rudder curve through the wing, and then through the left boom.



The rudder and elevator servos mount upright, while the aileron servo lays on its side, with the aileron connector passing beneath the servo mounting rail.



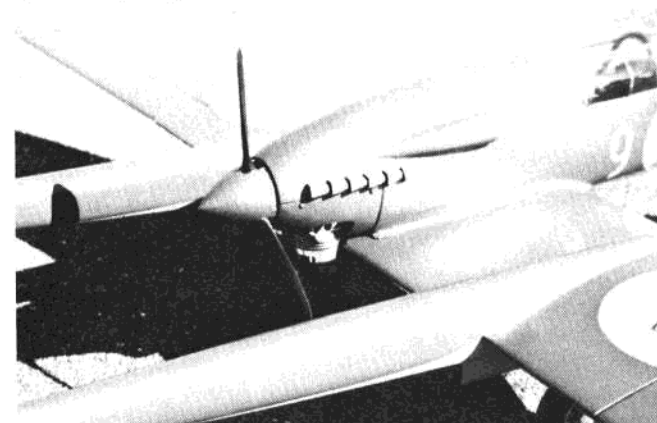
The rudder crossbar runs under the stab (the model is on its back in the photo). Both elevator and rudder connections are on the same side.



The Sullivan scale landing gear are rugged, yet easy to install. They are operational, and give that final touch of scale-like realism.



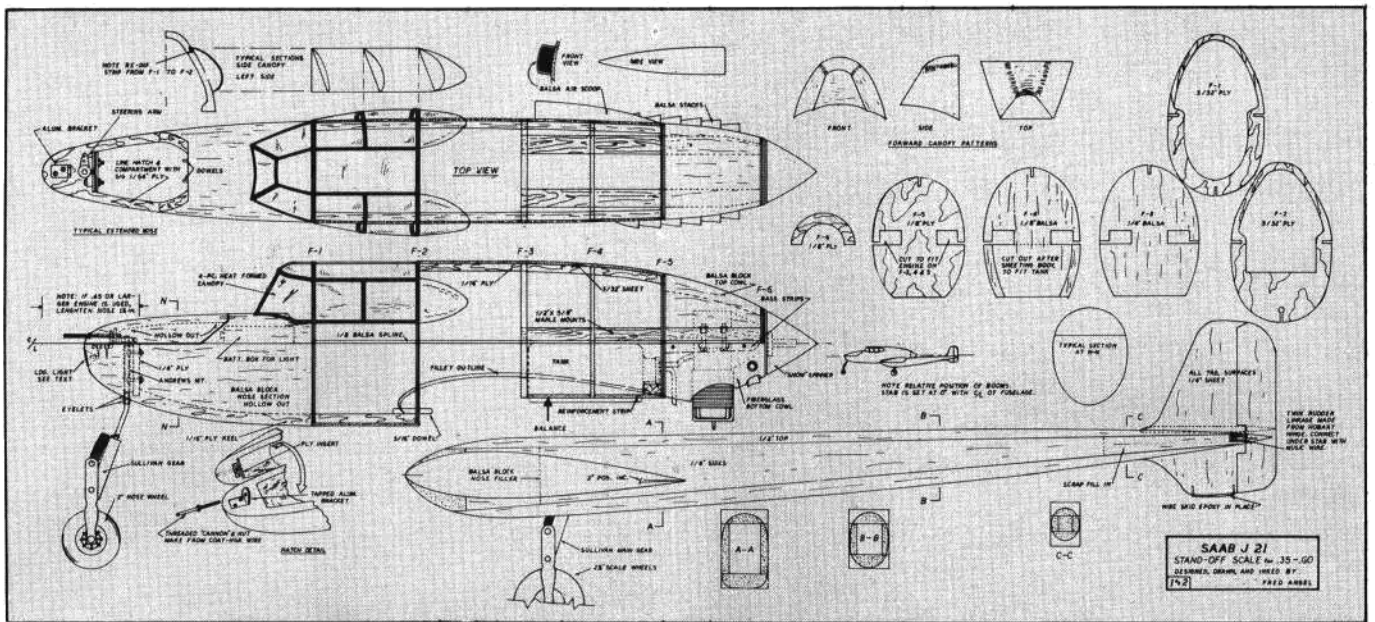
The access hatch to the battery compartment is molded from fiberglass.



The pusher installation is just the same as any standard tractor mount. There are many advantages of having the prop in the rear.



For the eye trained in viewing models with props on the nose, the Saab offers a pleasant change of pace.



Anchor the wing down to a flat surface, bottom up, and shim until the center section is level. Now align the booms evenly. Pin a temporary crosspiece to the tail end of the booms. When this piece is level with the center section, and the centerlines are parallel, glue the booms to the wing, first sliding the Nyrods through the left boom, or if you prefer, one on each side. Next, re-glue the forward top section of the booms.

While your assembly is aligned on the bench, make a pair of fins and glue in place. Save the end cones of the booms, which will be split and glued to the rudders.

The stabilizer is a flat sheet of 1/4" stock, with a shaped piece for the elevator. Round the edge and sand smooth, but do not glue in place just yet.

The next step requires patience, but it is most important. Make a cradle to support the fuselage. Use the motor mounts for one resting place and the nose wheel hole for another. Level the body fore and aft with the center

splines as reference, and the motor mounts leveled the other way. Make a template of the top of the center rib using the outline marked "Typical Section" on the plan.

Position the template on the fuselage so that the front of the ply plate rests on the back side of former F-2. The forward spar will be behind former F-3, and the trailing edge will probably touch the engine head. This will be trimmed to fit on final installation. Use a protractor or multi-level and position the template so that there is about 2° positive incidence. Trace the outline and repeat on the opposite side.

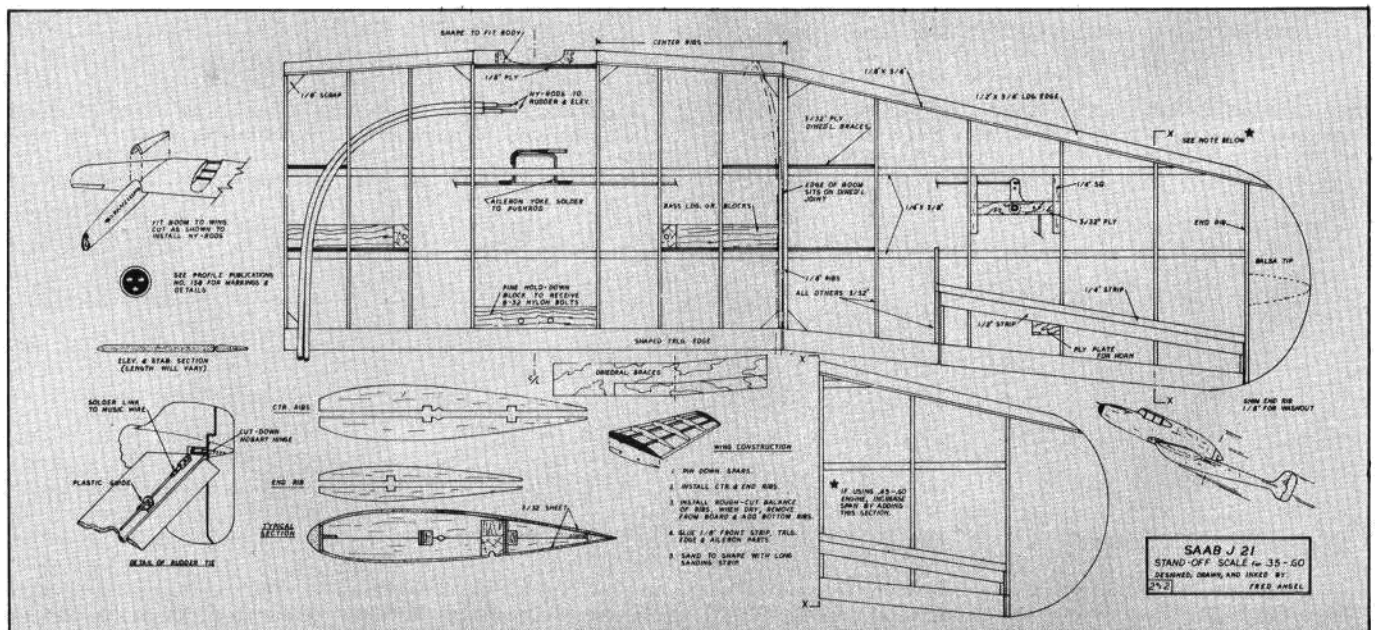
Then cut out the fuselage to accept the wing. Place the wing on the body, and scribe the fuse side outline at the contact point. Cut out the top of the wing along this mark, to give access to the center section for servo mounting. After mating wing to the body, drill and insert the front wing dowel, and drill and tap the rear hold-down section. Bolt the wing in place and re-check leveling

and alignment. Now go ahead and install the stab at 0° in relation to the body and level with the wing center. Note that the edges of the stab are square with the fins. For security, when you glue in place, push a couple of pins through the rudder into the stab. Push the heads in and fill the holes. Make fillets, where required, and give the model one last sanding.

The next step is finishing. The wing and tail surfaces were covered with silkspan; body and booms with Silron. After clear doping, colors were mixed using Aero Gloss dope. "Sticky" Mono-Kote was used to make masking templates for spraying the insignia trim. Attach the air scoop and engine stacks before final color application.

After finishing, install the canopy pieces using "goo" or your favorite technique. Strips of heavy bond paper were sprayed with color and the backs were sprayed with contact cement.

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Then the strips were laid in place along the canopy seams.

Install rudders, elevator and ailerons. Refer to the plan for the rudder tie-rod detail. All horns are on the inside of the booms.

The radio installation is a bit cramped with three servos in the wing well, and the motor servo in the space between F-2 and F-3. The receiver is sandwiched in foam between F-1 and F-2, and the battery fits up in the nose under the front hatch.

The nose wheel steering rod has a Kwik-Link where it attaches to the steering arm, which must be disconnected to remove the wing. Also mount the charging jack in a readily accessible spot.

Run the antenna wire under the center nose section of the wing, out to a landing leg, and back to one of the sub fins—keep it away from the prop.

Install the tank as shown, and mount the landing gear. The model was completed before the new scale plastic gear sections were available, so Sullivan gears were used. They are quite a nice unit, but the new ones would look equally good. The gear well covers were made from 1/64" ply and steamed to a curve.

The nose landing light was made from a three-volt pea bulb, and the reflector was a cone of silver paper. Use Tatone instrument parts to make the rim and glass. The boom lights were "borrowed" from my son's assortment of plastic car parts.

Now for flying. To insure success, certain prerequisites are required: (1) Dress sharp, (2) have your hair styled correctly, (3) line the chicks up along the runway, (4) and be very efficient in starting the engine and checking the controls.

Then hand the transmitter to the grubbiest guy on the field (who just happens to be the best flier) and, as he puts the little ship through its paces, casually saunter over to the spectators and keep up a running commentary. Throw in a few expert words like "double Immelman," which is easy to say in the clear, crisp air at the local field, but nearly impossible in the smoke haze at the local pub! Set a date for later that evening with the most enthralled spectator, and after the blond, brunette and red-haired powder puffs have disappeared in a roar of double carbs, grab the box back and fly like you usually do—giant left hand circles with maybe one semi-controlled loop and a side-splitting roll!

Only kidding, sport. The Saab is a pleasure to fly and, except for an out-of-trim condition easily corrected with ailerons, the maiden flight was a real joy. One caution though. Keep it close to you. Those drab colors look good in the judging circle, but they are a real eye-buster up high.