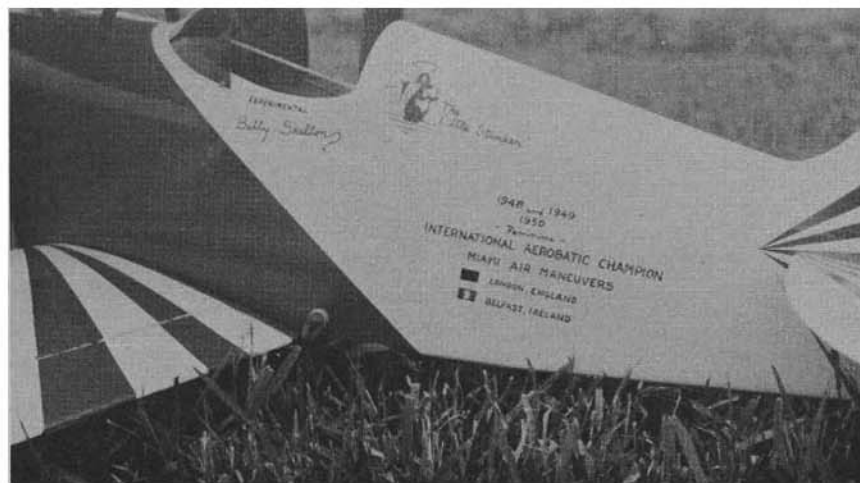
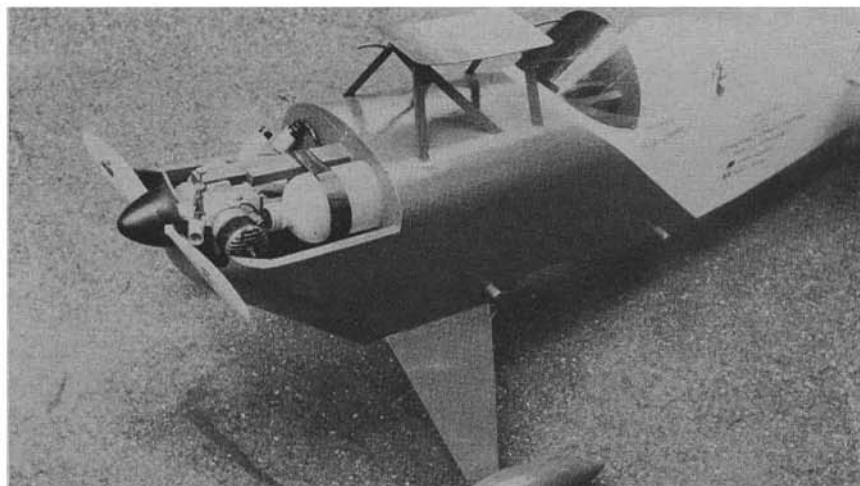




Pitts Special

Nick Zirolì's R/C version of Betty Skelton's colorful 'Little Stinker.' Fully aerobatic Class III design.



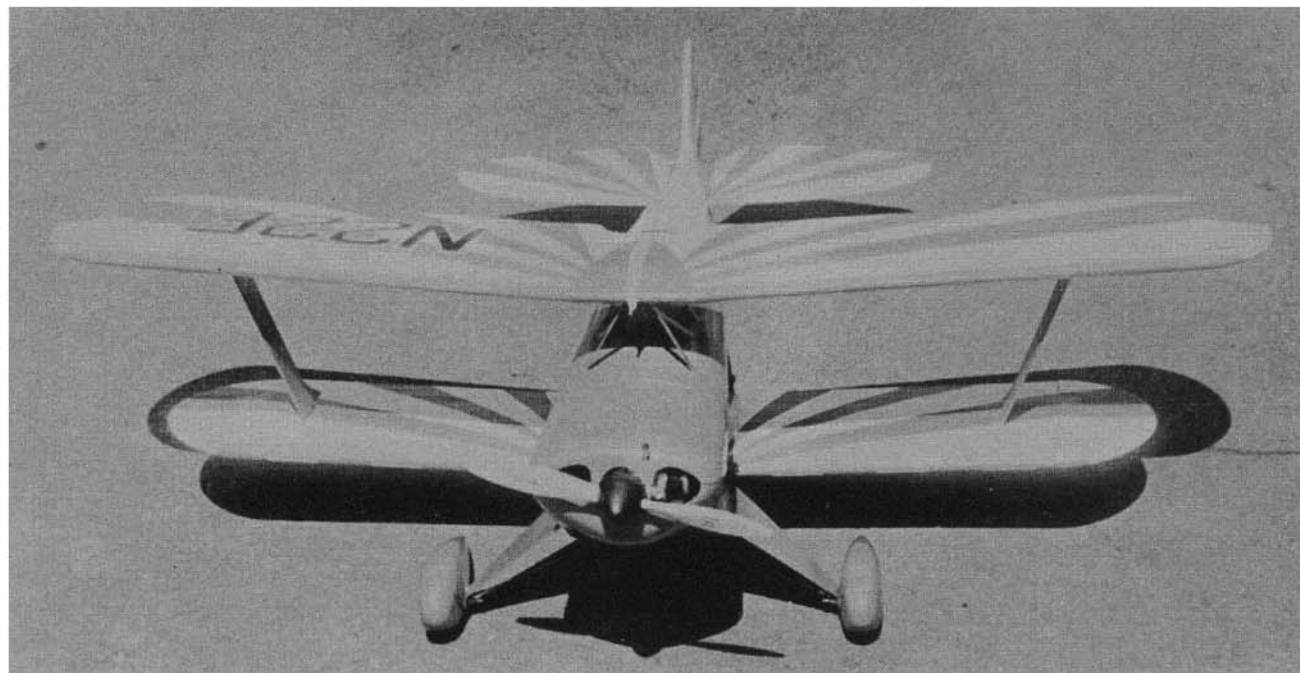
BIPLANE models have always enjoyed a fair amount of popularity. Being partial to biplanes myself I have built and flown a number of them as controlliners. Although I must admit I never enjoyed building and finishing that extra wing, especially when that wing could be going into a new plane! This was in the days when I would build every brainstorm I had, or design that I liked. Now I build fewer planes and pick only the designs that appeal most to me.

Feeling that there must be something to this sudden popularity of R/C biplanes, I felt I had to try one and find out what I was missing. As I build mostly scale or semi-scale, I wanted a design with nice lines that could be adapted to R/C without too much modification.

After much searching and thought I decided that Betty Skelton's colorful Pitts Special, "Little Stinker," was just what I was looking for. It has the lines and color scheme that make it stand out at any flying field. Plans were drawn up in a size I felt would accommodate a .45 to .60 engine and full house multi. Wing area wound up at 760 sq. in. with a span of 52 inches. With a height of a little over 16 inches it looks much larger than it actually is. A K&B 45 with a 12-5 prop was used for power on the prototype. This proved to be ample but also the minimum recommended engine size. Radio equipment consisted of an Orbit 10 and Transmire servos. I am sure that a 6 channel with coupled ailerons and rudder would more than keep things under control.

Although not to exact scale, there is no mistake that this is a "Pitts Special." One change that was felt to be necessary was to move the wheels closer to the center of gravity in order to improve ground handling. Nothing is more discouraging than to have a plane you can't get off the ground! This I found out from experience with a J-3 Cub that loved to chase its tail all over the field! Come to think of it, I don't believe it ever did make a successful take off. The Pitts, on the other hand, seldom fails to get off the ground on the first attempt.

Construction is all common practice with no special tools or techniques required. That is, except for the cabane struts. These are fabricated from steel strips and joined with "Pop" rivets. I found this much easier and more accu-



rate than using music wire and solder. If you don't own a "Pop" rivet gun you should invest in one now, as they are inexpensive and very useful.

Start construction with the wings. Although there are two to build they are not difficult and go together quite rapidly. Cut out all the wing ribs from medium $\frac{3}{32}$ " sheet. I made 36 W-ribs by stacking between two templates and carving to shape. These are modified for sheeted areas and ailerons. Pin the ribs in place over the plans. Cement top spar, leading edge and upper trailing edge sheet in place. On the lower wing add the trailing edge cap in the aileron area.

Notice that all leading and trailing edge sheet is 2" wide except for the lower wing trailing edge. This is a stock size or can be made by splitting 4" wide sheets. Cement $\frac{1}{4}$ " sheet wing tips in place followed by top spar pieces between the end ribs and tips.

Now, remove from the plans and turn the wing panel upside down on the building board. Cement the lower trailing edge sheeting in place, pinning through the top sheet into the board. This should assure a straight trailing edge with no bows or curves. Add the $\frac{1}{4}$ " square lower spars.

Join the wing panels using necessary joiners and stub spars. The top wing has no dihedral, the bottom $1\frac{1}{2}$ " under each tip. Sheet the leading edges and center sections. Cement the wing tip fairings in place and round off, blending into the leading and trailing edge sheets. Shape the leading edges and sand the legs off bottom of ribs.

Build up the ailerons from $\frac{3}{32}$ " sheet. Don't forget to install the hinge anchor blocks in both ailerons and wing. Bend the aileron torque rods to shape with $\frac{3}{32}$ "

I.D. bearing tube in place. Cut a groove in the top center section sheeting and epoxy the torque rod assembly in place. Standard strip aileron linkage is used to tie them to the servo.

Cut the stabilizer outline pieces to shape from $\frac{1}{4}$ " sheet. Lay the $\frac{1}{16}$ " bottom center section sheet over the plans. Pin spars and outline pieces down on the plans with $\frac{1}{16}$ " shims under the $\frac{1}{4}$ " outline pieces. Block up the rear of the trailing edge so that final airfoil will be symmetrical.

Cut to length and cement in place all $\frac{3}{32}$ " x $\frac{3}{8}$ " ribs. Glue hinge blocks and gussets in place followed by the $\frac{3}{32}$ " x $\frac{1}{4}$ " center section ribs and top sheeting. When glue has dried, remove the assembly from plans and sand to airfoil shape. Cover stabilizer, elevator, and wings with silk. Join the control surfaces with nylon hinges.

Fuselage sides are cut to outline shape from medium hard $\frac{1}{8}$ " sheet. Notice how one side of the removable cowl runs farther down the side than the other. This should be on the side that the engine cylinder will face. If you prefer, the engine may be mounted upright or inverted simply by relocating the motor mount holes in the formers. For accessibility and simplicity of operation the upright position is generally favored, so if you don't mind the cylinder protruding out of the cowl, mount it upright. In this case a removable cowl would not be necessary, just a larger hatch in order to get at the fuel tank and batteries below.

Mark the location of all formers and uprights on the fuselage sides. Remember, one right and one left! Cement $\frac{1}{4}$ " square stringers and uprights in place followed by the $\frac{1}{4}$ " x 1" lower doubles. While the sides are drying cut out all

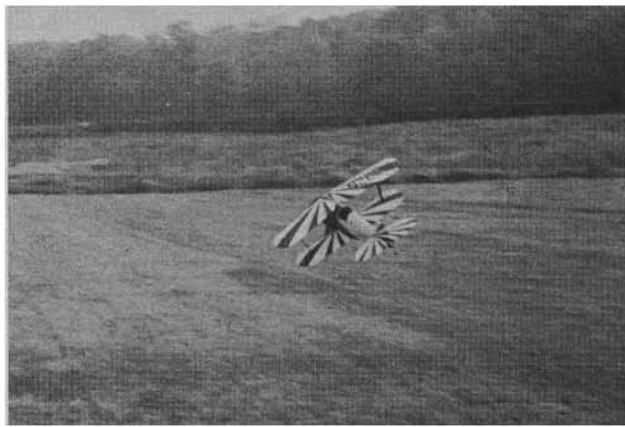
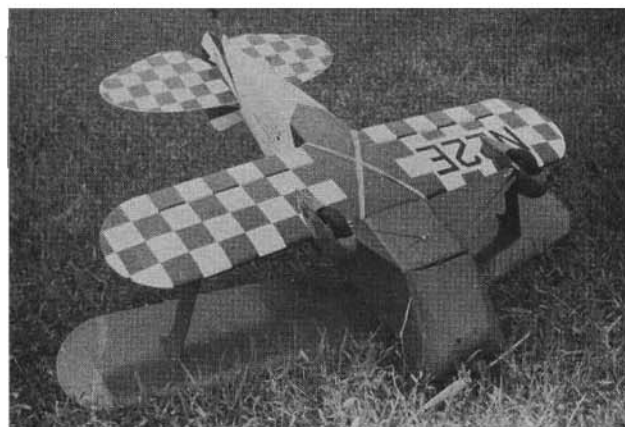
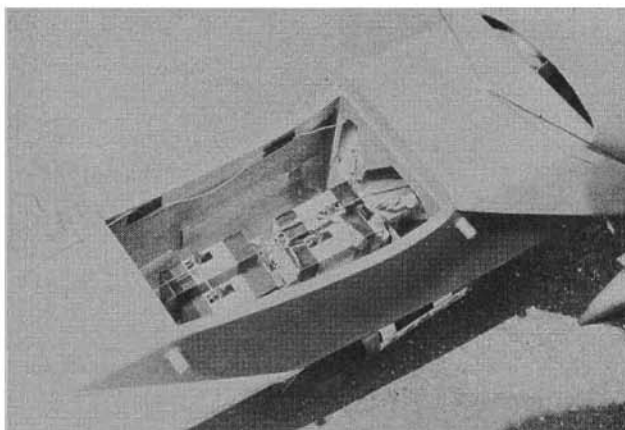
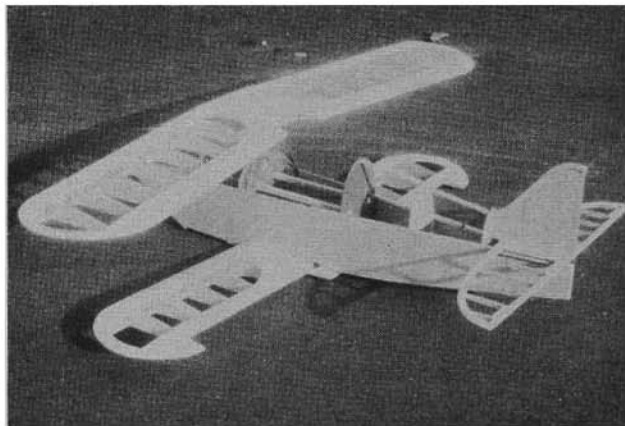
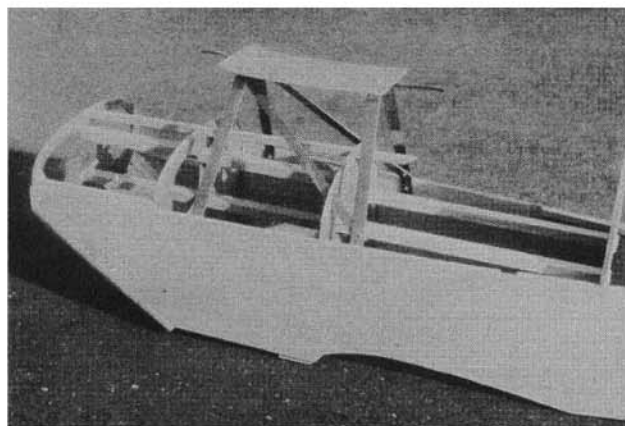
fuselage formers. Join the sides at the tail and former F-4. Epoxy firewall F-2 in place and hold with rubber bands until dry.

The cabane strut assembly is partially built as a separate unit and epoxied to the fuselage sides. A more conventional strut assembly may be fabricated of $\frac{3}{32}$ " diameter wire if the $\frac{1}{16}$ " x $\frac{3}{8}$ " steel strips are not available to you. I obtained this material and the $\frac{3}{32}$ " aluminum for the landing gear from a local machine shop. The owner was good enough to cut the landing gear to shape, saving me a lot of work. These shop owners are usually very willing to give a few minutes of their time to someone with a problem such as this. They, more than likely, have built models themselves.

Cut the strut legs to length and drill all the holes. Bend to shape to conform to the front view. Prepare the $\frac{3}{8}$ " plywood doubler. Pop rivet the struts to the plywood maintaining the correct angles and alignment. Do not rivet the diagonal brace in place now as this must go through a hole in F-3.

Place the strut assembly in position in the fuselage and press the rivets against the inside of the sides. Remove and gouge out enough material to clear each rivet head. Epoxy in final position and hold with clamps. Check the incidence angle with an airfoil template placed on top of the struts. Measure from leading and trailing edge down to a strip placed across the top of the fuselage. There should be between 0 degrees and +1 degrees of incidence. Adjust front or rear of plywood doublers up or down, to obtain this angle.

When this has cured add the remaining formers, crosspieces and stringers. Epoxy the $\frac{3}{8}$ " x $\frac{1}{8}$ " hardwood motor mounts, landing gear mounts and servo



board rails in place.

Rivet the diagonal cabane struts to the uprights now but leave the wing platform and hold-down wire off until the fuselage is completely finished. Plank the lower nose section with $\frac{3}{16}$ " x $\frac{3}{8}$ " strips. Do not cement planking to F-2-B as this will be removed after sanding the outside to shape. A layer of fiberglass and resin on the inside will add strength.

Cement the completed stabilizer in place. Check alignment before cement dries. Cover the fuselage top and bottom with $\frac{3}{8}$ " sheet balsa. Partially cut through each strip at the cowl separation line. After the planking is sanded to shape the cowl may be easily cut free. Cut cockpit opening to shape. The nose may be carved from balsa blocks or

made of fiberglass. Fiberglass was used on the original model. This was molded over a form using the "easy does it" method, with which I am sure most everyone is familiar.

Cement the fin and tailpost in place and align very carefully. The leading edge doublers and brace are next, sanded round when dry. Cover each side of the fin with silk. This will be easier if the silk is applied wet.

Bolt the landing gear legs in place. Keep the bends where the legs leave the fuselage parallel to each other and center line of the fuselage. Epoxy the $\frac{3}{8}$ " x $\frac{1}{2}$ " hardwood landing gear strut hold-down in the center of the bottom. Fit and carve the $\frac{1}{2}$ " bottom blocks to shape. Cement securely in place and bring to final

shape. Drill holes and install lower wing hold-down dowels.

Cover the entire fuselage and rudder with silkspan or silk, if you prefer. Silkspan was used on the original with satisfactory results. Hinge the rudder with nylon hinges.

Apply as many coats of clear dope as necessary to the fuselage and wings to make a good base for the final finish. Sand between coats.

At this time install the upper wing platform and hold-down wire with clips and "pop" rivets.

Mount the wings on the fuselage and make the gap between both upper and lower wing tips the same. Hold them in

position with temporary spacers pinned between tips. Due to the many variables built into the plane it is doubtful that the interplane struts will fit exactly as shown on the plans. Make a pair from heavy cardboard a little longer than shown and trim these to fit. They should be under a little tension. When you are satisfied that they are correct trace them on to $\frac{1}{8}$ " plywood and cut out. Round off the leading and trailing edges and prepare surface for final finish.

If at all possible the final finish should be sprayed on. It is much easier and faster than brushing and requires less dope. This is especially true in the case of the white areas. I first painted the entire plane white, applying more coats in the areas that would remain white. The bottom of the top wing and the front half of the fuselage were then masked off and sprayed red. The remaining red was masked off and painted with a brush. This was found to be faster as everything does not have to be covered against overspray. License numbers may be cut from decal sheets or, as on the original, masked and painted black. White trim tape was applied to the borders of the numbers on the upper wing. Red decal sheet was cut into squares and applied to the bottom of the stabilizer. Decals could also be used on the bottom of the wing but I chose to paint the checks on. The black skunk on the sides of the fuselage was sketched on with a soft pencil and hand painted using a fine brush. All the lettering on the fuselage was applied freehand with a #3 Rapidograph ruling pen and India ink. A coat of clear fuel proofer was brushed over the lettering and decals when they had dried.

Install the wheels and wheel pants. I used the axle bolt to hold the pants so that in the case of a hard knock they could turn rather than break. Takeoff and landing was not hindered by the pants in all the tallest grass, at which time they were removed for flying. They may be carved from laminated blocks, molded of fiberglass or purchased ready made. I used a pair of Ellis R/C wheel pants. These are plastic and have proved to be very durable.

Mount the tail wheel bracket and tail wheel. Couple to the rudder.

Install the engine with about 3 degrees down thrust and right thrust. The fuel tank is strapped to the motor mounts and protrudes through the firewall.

Radio equipment, servos, and the required linkages are installed to complete the model.

If you have even a small amount of multi flying time you should not have any trouble with the "Pitts." It is very stable with good control response and a real pleasure to fly. I enjoy **watching** it fly as much as I enjoy flying it. On a low level pass the only thing missing is a pilot's head behind the windshield! I've

tried all my kids' dolls but can't find one that looks quite right.

I'm sure you will get as much enjoyment from flying and watching the "Pitts" perform as I have.

Good luck.

**From
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