



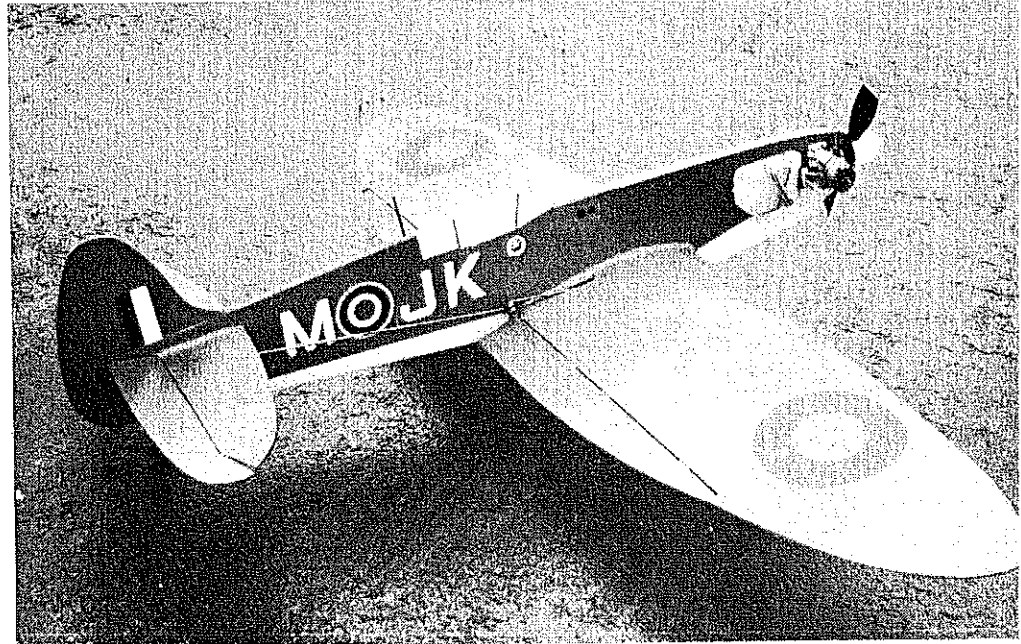
# SPITFIRE

For sport flying and mock combat demonstrations this 35-powered stunter is a highly recommended project. Plans show alternate fuselages—one a true profile, the other a built-up profile.

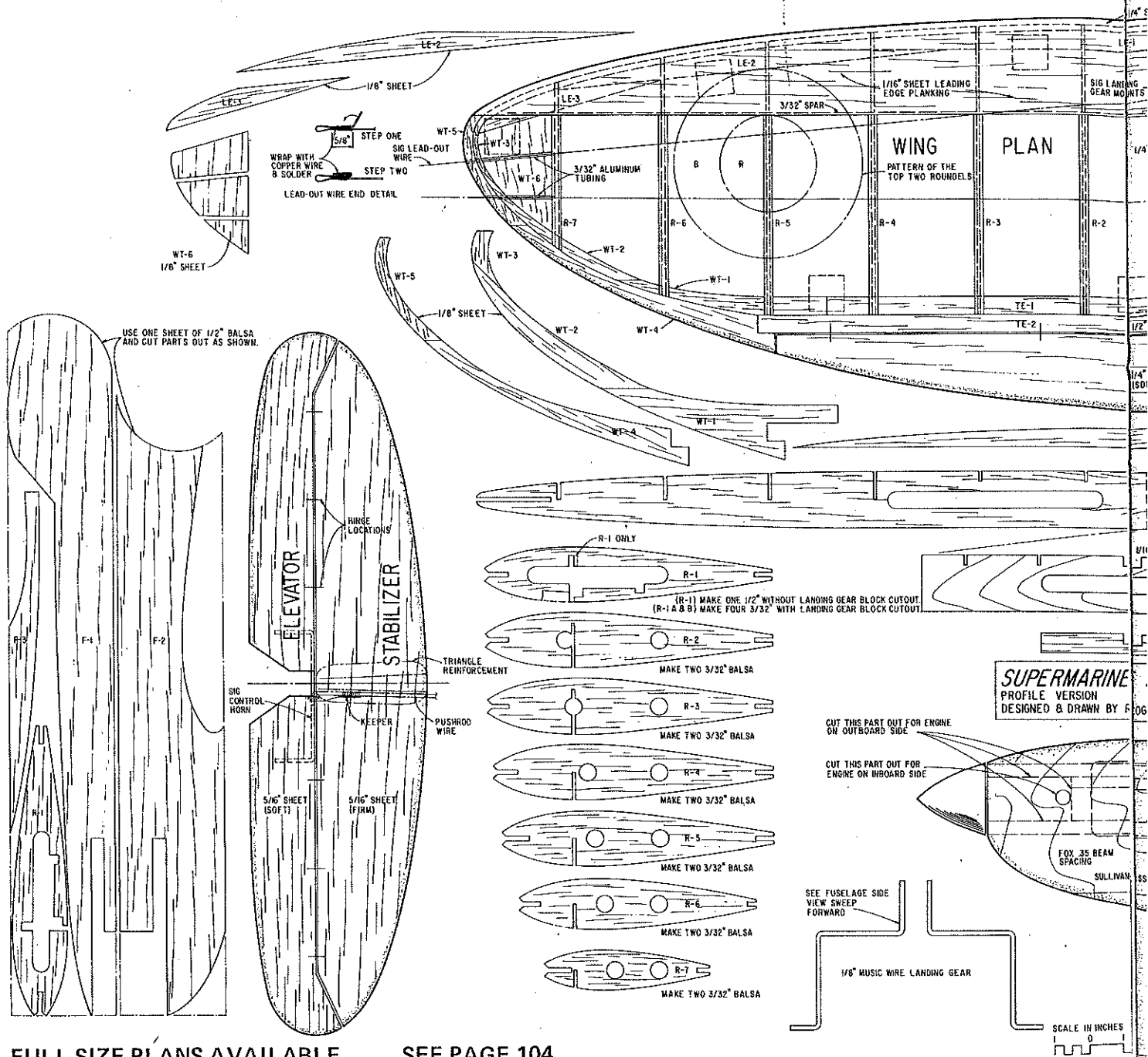
■ Roger Greene

THE SUPERMARINE Spitfire was one of the most beautiful and deadly fighter planes of World War II. For a long time control line enthusiasts have wanted a workable model of this airplane for sport flying and mock-combat aerial demonstration. Now they can "burn up the skies" with my control line model—both "solid" and "built-up profile" concepts. These models fly beautifully and look great; a real pleasure to build, a joy to fly, and a pleasure to have.

The Spitfire was conceived by the fa-



Top: One of the nice features of the built-up profile version is that one does not see such unpleasantness as the normal seam between plywood doublers and the balsa. The identification letters, while scale-like, actually are the initials of the three club members who built one of these Spitfires. Above: The elevator/flap linkage shows clearly in this photo—the surfaces are positioned to convey an impression of the relative amounts of movement. Alas, the tank could not be hidden!



**SUPERMARINE**  
 PROFILE VERSION  
 DESIGNED & DRAWN BY F. OG

**FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 104**

mous British designer R. J. Mitchell in the mid-1930s. It first flew in 1936. The last Spitfire was made in 1947, closing out the more than 20,300 "Spits" which dominated the skies of Britain during World War II.

I designed the Spitfires described in this article to fill what I saw as a need—both as a builder and as a stunt flier. In the past, members of the Sky Lancers of Washington, known as the "S.L.O.W. Club," have staged mock aerial combat using various airplanes built from Midwest World War II kits. These are good-sized, with a wingspan of 48 inches, and are usually powered by a Fox .35 engine. The Messerschmitt Me-109 and the P-51 Mustang dominated



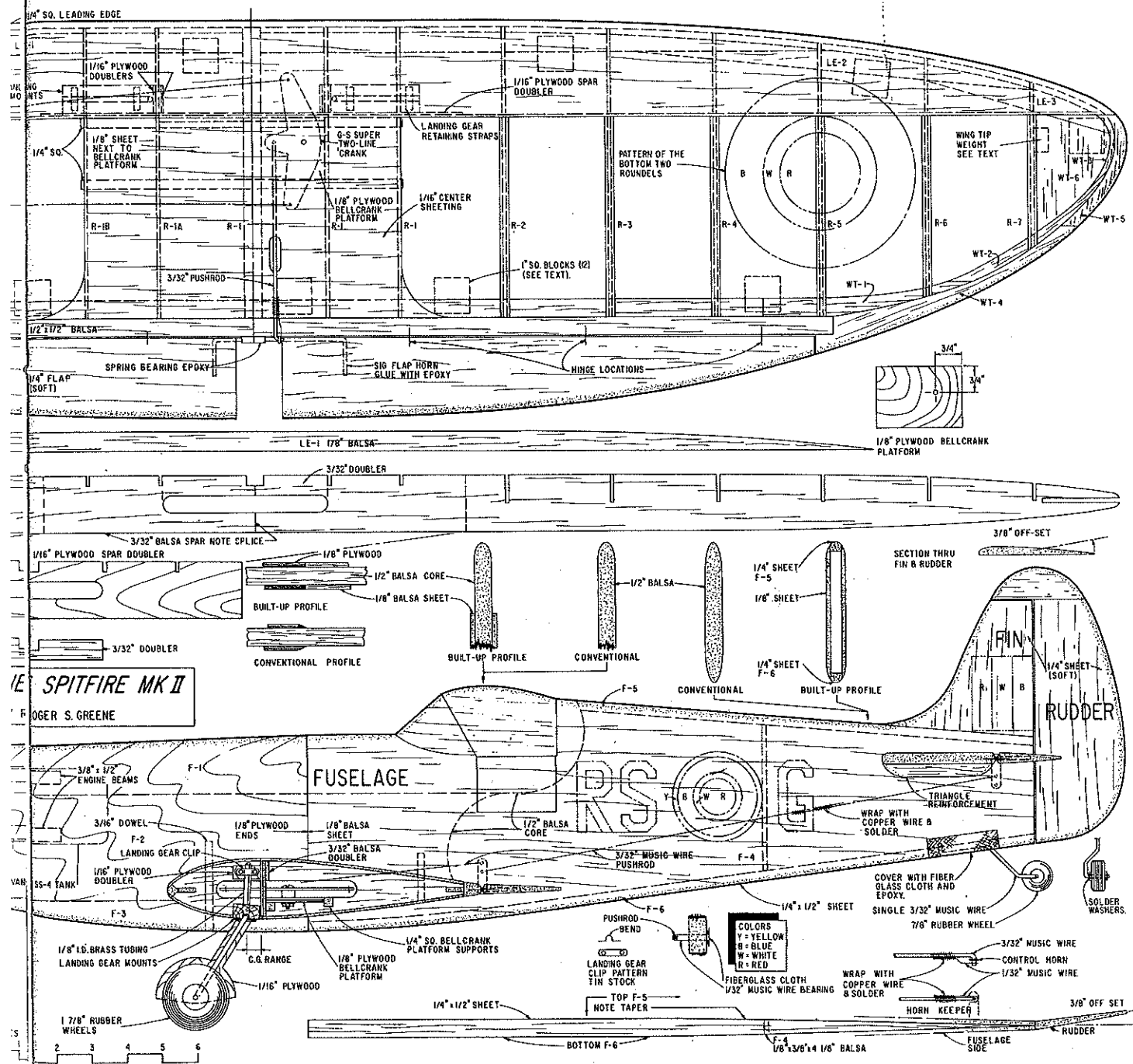
Roger feels for that first bump of the primed engine before briskly flipping the propeller.

the mock aerial combat field, and some club members wanted a British model to help "fight" the Me-109.

This article describes two Spitfires which can be built on a 50-inch wingspan plan to provide first class, and historically accurate, competition for the flying Me-109 models. They are a "solid profile fuselage" and a "built-up profile fuselage"—both fly the complete AMA Precision Aerobatic Pattern.

**Construction**

Study the plans thoroughly before you put your knife to wood. Cut patterns for the individual parts out of the plan, taking care not to cut the spar pattern in half. Use a felt tip pen to trace the patterns on the wood. However, if the Spitfire is to be built by several members of your club



you can mount the patterns on some type of sturdy backing. The method I use is to glue the patterns on "gift box" cardboard; it is just about the right strength and weight. Get a large box with handles from a department store.

In studying the building sequence it may seem that we are jumping around a bit, but it has been designed to get the most work done in the least amount of time. By working on one assembly while the glue is drying on another you can get the Spitfire built and on the field sooner.

Begin with the wing spar. Use two sheets of 3/32" balsa as shown on the plan. You'll have to make a splice in the middle, so cut your wood accordingly. Then cut the 1/16" plywood spar doubler which will be glued in front of the full-depth spar. A piece of 3/32" balsa is the rear spar doubler. These

doublers are necessary for added strength. Align these pieces over the cardboard-mounted plans, glue, and clamp them for drying.

**Fuselage:** While the spar and its doublers are drying, start building the fuselage. You have the choice of building the "conventional profile" or the "built-up profile" fuselage—both are shown on the plan. The "built-up profile" will be lighter in the aft section and will look a little more realistic because you won't see the joint of the plywood doubler, and the canopy will be outlined in wood instead of paint only.

**Built-up Profile Fuselage:** Start by making the more or less solid portion of the fuselage. Use one sheet of 1/2" x 3" x 36" balsa. Cut out parts F-1, F-2, and F-3. Be sure to follow the curves just behind the canopy.

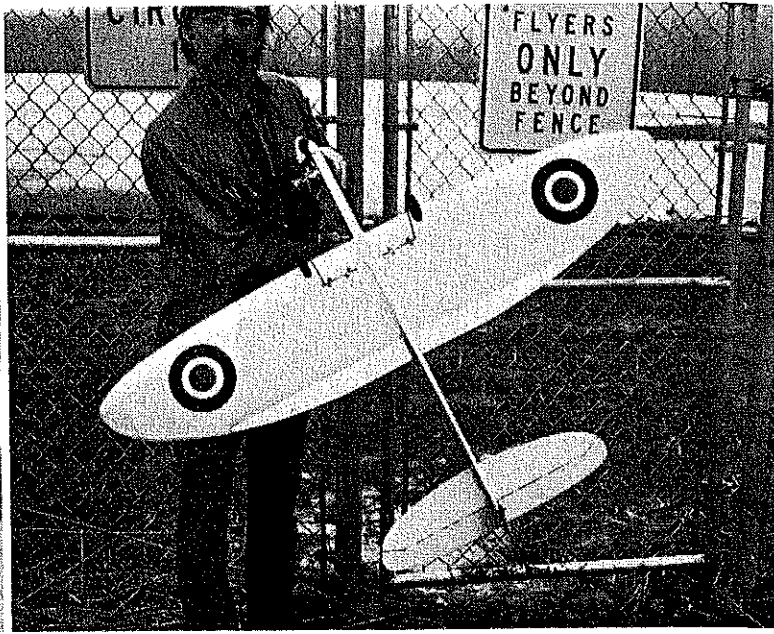
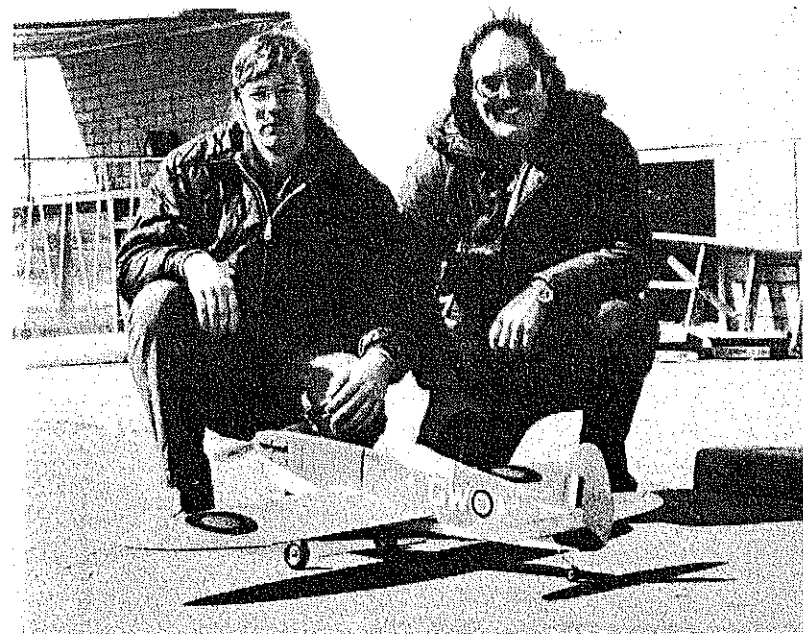
The 1/2" center rib (R-1) and F-3 are cut from the unused part above the fuselage. After the fuselage pieces are cut, glue F-1, F-2, and F-3 together over the plan using Sigment and pins.

**Conventional Profile:** Glue together two pieces of 1/2" x 3" x 36" balsa with Sigment to make a 6"-wide piece. After the glue is dry, cut to shape as shown. You will still have to cut F-3 and glue it as shown on the plan. Cut the hole for the wing, engine, and engine beams.

Cut 1/8" plywood fuselage doublers to shape, one with space to mount the engine on the outboard side, one with a hole for the bottom back plate screw of a Fox .35— inboard side. Apply Sigbond aliphatic resin, clamp, and let dry overnight.

**Stabilizer and Elevator:** While the fuselage





Left: George Marenka and designer/author Roger Greene (right) with George's Spitfire. Right: Mike Kresan displays the bottom of his Spitfire to show the contrast between the top and bottom paint schemes. The color scheme depicted on the model is authentic.

is drying, cut the horizontal stabilizer and elevator out of 5/16" balsa sheet if available, otherwise use 1/4" balsa sheet (firm). Cut the fin and rudder out of 1/4" balsa (medium). The flaps are cut from 1/4" balsa (soft).

**Wing Tips:** The wing tip pieces (WT-1 through WT-6) are cut out of 1/8" balsa sheet. Glue WT-1, WT-2, and WT-3 together; make two assemblies. Glue WT-4 and WT-5 together; make four assemblies.

The wing leading edge (LE-1, LE-2, and LE-3) is cut from 1/8" balsa sheet. LE-1 can be a 1/8 x 1/2 x 36" piece cut to fit. Cut two

each of LE-2 and LE-3. Glue LE-1, LE-2, and LE-3 together over the plan.

Cut the trailing edge (TE-1) from 1/8" balsa sheet. TE-2 is sanded from a 1/2 x 1/2 x 36" strip; use a piece that is as straight as possible.

**Wing Ribs:** Carve the ribs out of 3/32" balsa. Be sure you make the right number of each rib, and that the cut-outs are correct on each rib. Also make holes for the lead-out wires on the inboard wing panel. Glue the 1/16" plywood doublers on R-1A (see plan).

**Built-Up Profile:** After the 1/2"-thick fuselage is dry, you can lighten it by cutting out unneeded portions of the wood. Use a metal lipstick top or a 1/2" piece of brass tubing as you would a cookie-cutter to cut out the useless balsa weight. Sharpen one end, put a 3/32 x 4" piece of music wire through the side and solder it in place; the wire will act as a handle to help you twist it. With this tool, cut holes 3/4" behind the engine mounts, 1" above the wing, 3/4" below the top of the fuselage, and so forth. Leave at least 1/2" at the rear of the 1/2" sheet.

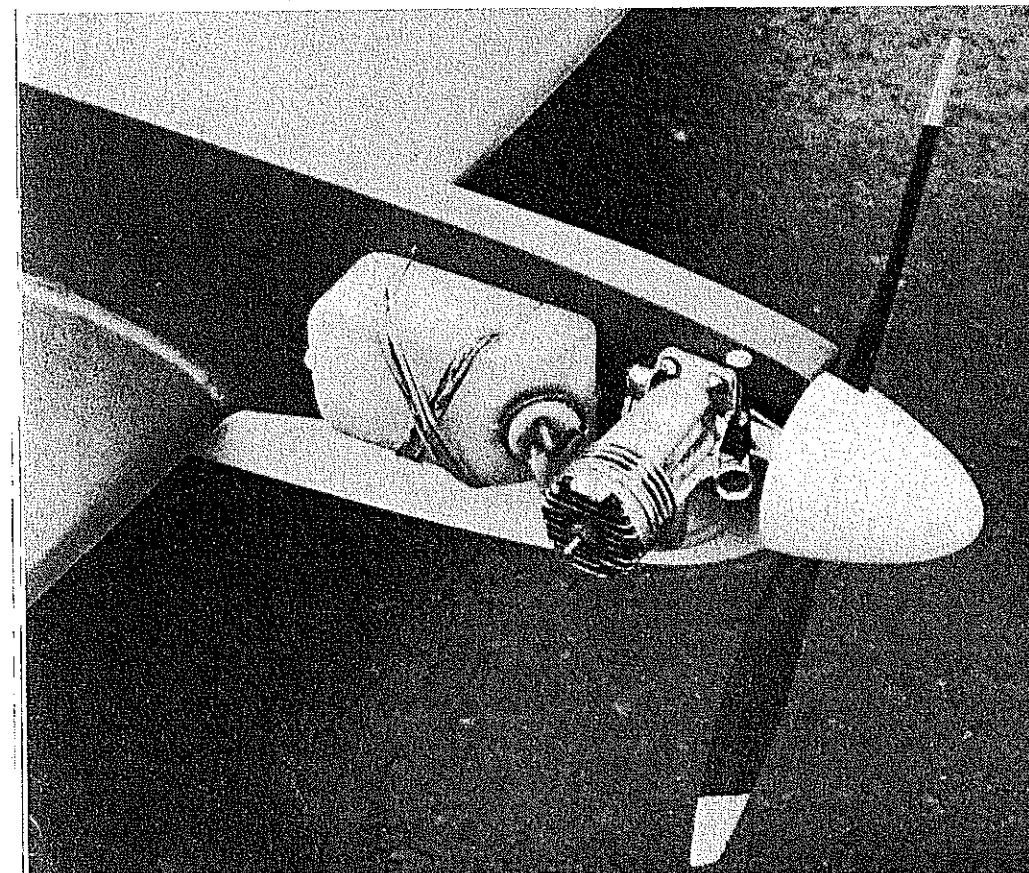
Glue the 1/8" plywood doublers to the 1/2" balsa fuselage; Sigbond Aliphatic Resin works very well. Be sure that the cut-outs for the engine are on the proper sides of the airplane. Let the fuselage dry overnight. Make a simple wood clamp to glue the doublers: two pieces of 1/4" plywood, and six 2" 6-32 bolts with a washer on each end and a butterfly nut for easy tightening.

**The Wing:** Find rib R-1A and drill two 1/8" holes in it for either a Veco landing gear clip, or one of your own making; if you don't have a Veco, make a landing gear clip out of a piece of tin as shown on the plan. The location of the clip is shown in the wing section on the fuselage plan. Hold the spar with the slots up, place R-1 in the center, place R-1A next, and then R-1B. Insert the two 1/4"-sq. bellerank supports, then place all of the other ribs on the spar in order.

Insert TE-1 and the leading edge assembly (LE-1, LE-2, and LE-3) into the slots in the ribs, then insert both wing tip assemblies (WT-1, WT-2, and WT-3).

A simple wing jig will be necessary to make sure your wing doesn't warp or twist while the glue is setting. Take a piece of balsa 1" square and 12" long. With your felt-tipped marker draw a line along its length, right down the middle. Now cut

The energy department consists of, in this case, a beam-mounted Fox 35 and a Sullivan SS-4 tank, rubberbanded in place. While the flier may try different props, a good all-around size is a 10-6.



the piece into 12 equal pieces; these 12 1" cubes will be used to support the wing when you glue it. Place the blocks as shown on the plan under the leading and trailing edges of the wing assembly, with the reference line (the one right down the middle) up as a guide. Pin the blocks to the work bench. Align the ribs to the plan. Pin the leading edge (LE) and trailing edges to the ribs. Then pin the ribs to the spar and to the center 1/4"-sq. balsa bellcrank platform supports. This is done to ensure a straight and true wing.

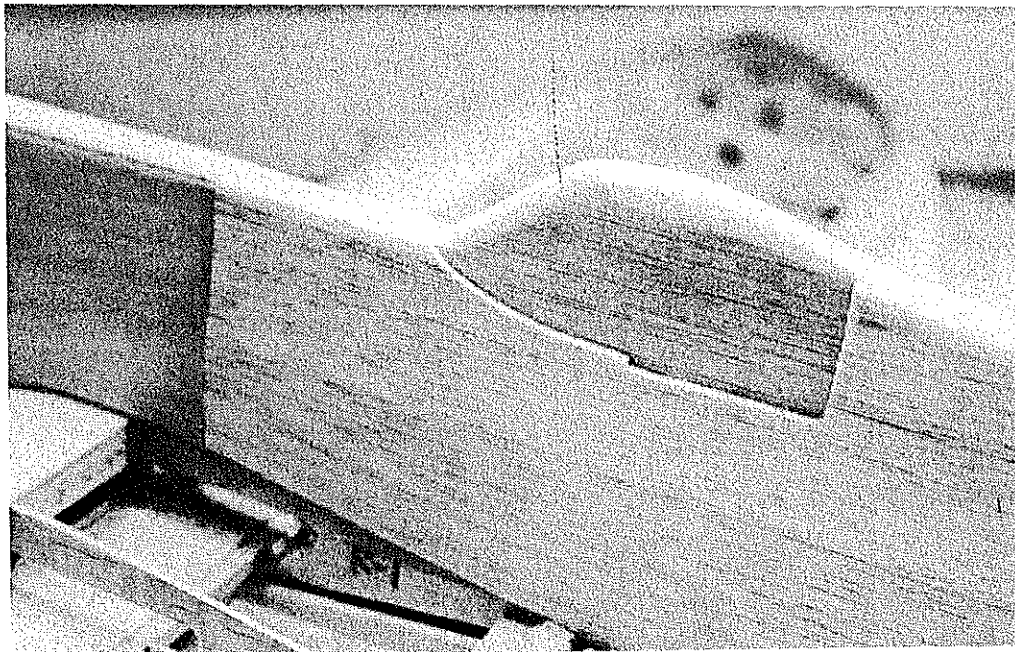
Now glue the various wing pieces together: ribs to the spar, the wing tips, the leading edges and trailing edges, and the 1/4" squares. Then insert the bellcrank platform and glue it in place with aliphatic glue. Let the wing dry overnight.

**Back to the fuselage:** When the "built-up profile" fuselage with parts F-1, F-2, and F-3 is dry, unclamp it. Next, cut the 1/8" sides to shape. Cut the top and bottom pieces from 1/4" sheet balsa 1/2" wide. Note the taper shown on the plan. Glue on one of the 1/8" balsa sides and the top 1/4" strip F-5, and part F-4. Lay the front part of the fuselage on the bench with the 1/8" balsa side down. Prop up the aft portion 1/4" and let it dry, then glue on the other side of the fuselage, pin it in place, and set it aside to dry. *Do not glue* on the bottom of the 1/4" strip yet.

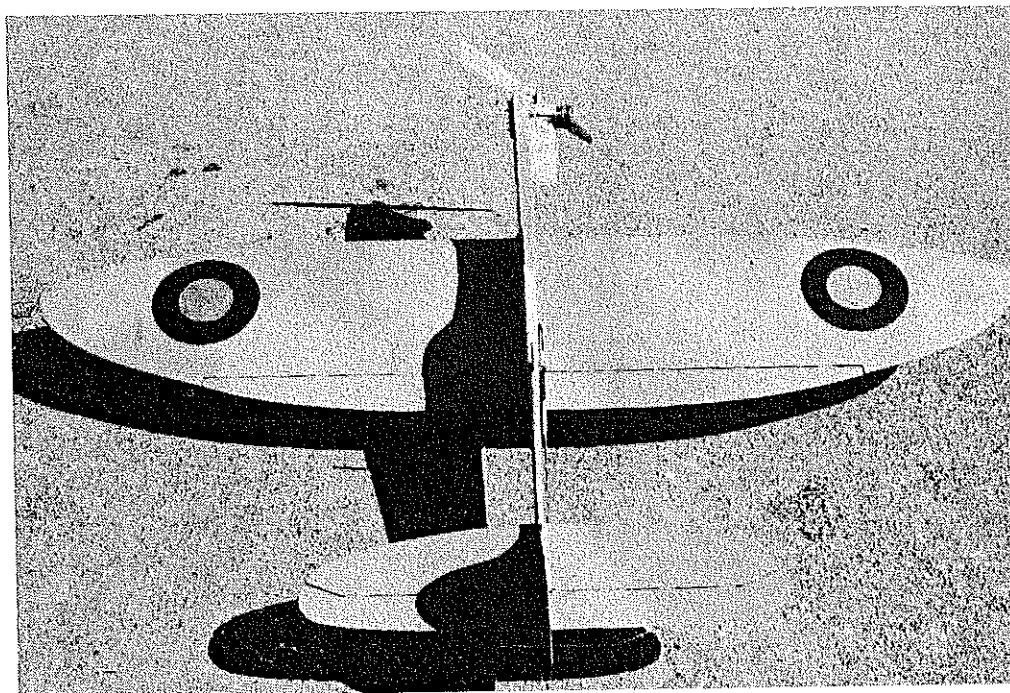
**Easy Does It!** While you are waiting for the glue to set, cut out and sand the flaps, rudder, fin, elevator, stabilizer, and 1/2 x 1/2" TE-2 trailing edge of the wing to shape as shown. If you do this all in one sitting your arm should feel as though you have just pitched nine innings. A word of caution, though, don't go too fast; take it easy and let those beautiful Spitfire lines develop slowly.

**The Wing Again:** When the wing structure that you set aside to dry has, indeed, dried, glue TE-2 in place behind TE-1. A snug fit is required between it and the WT-1s. Next glue on the 1/4" sq. leading edge. If it won't bend easily around the wing tip, wet it and

*Continued on page 97*

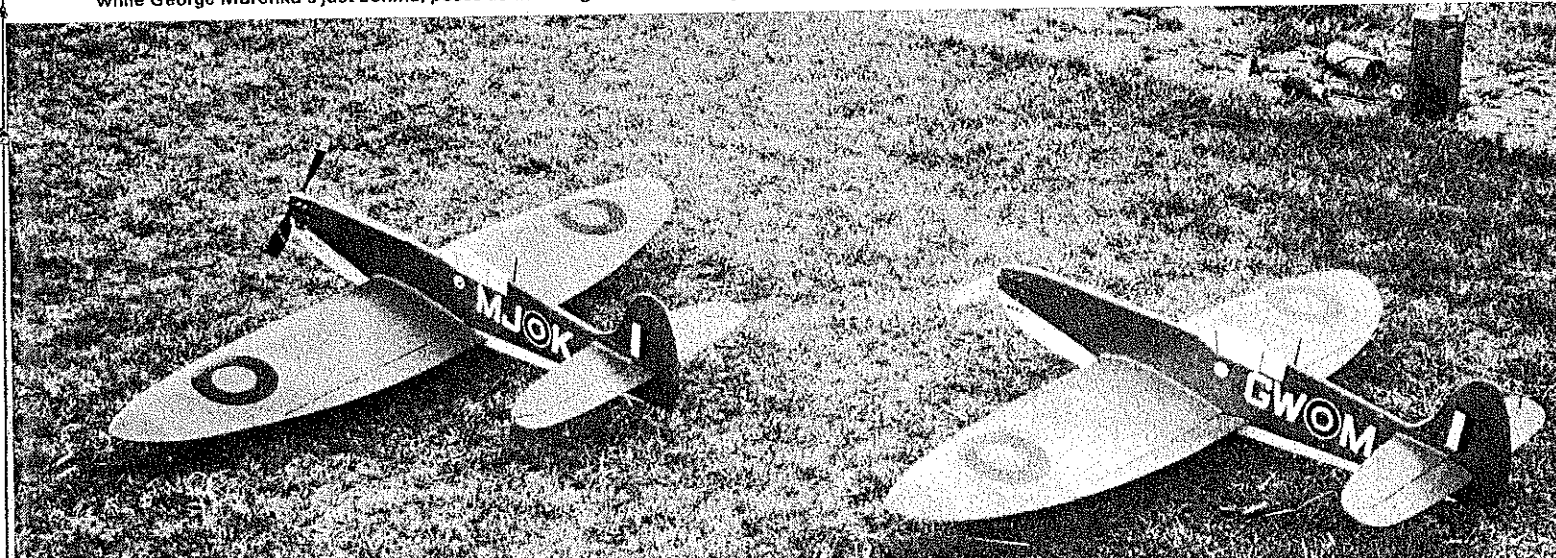


Here's a clever trick to add realism—if you are making the built-up profile. Cut away the surface laminations around the canopy area. And note the smooth joint between doublers and side skin.



The big attraction of the Spitfire is its distinctive planform. Its fine all-around performance came from a great engine, ultra-clean streamlining, and unusually large wing area for WW-II fighter.

Two of the trio of Spitfires ready for a go against the Me-109's flown by other S.L.O.W. club members. Leading the way is Mike Kresan's ship, while George Marenka's just behind, poses as the wing-man's. Coloring is olive and tan camouflage, with light blue undersurfaces.



about contests and new products. We will publish some of them in each column; if you like your name in print, write us.

Fred Randell—MA Enterprises, 659 Colony Rd., Box 7305, Canal Fulton, OH 44614 (216/854-4233)—is producing his ink-sack pen bladders again. Price is \$18.00 per hundred, plus postage.

Nick Arpino—Darp Speed Pans, 301 Woodacres Rd., East Patchogue, NY 11772 (516/286-8144)—is adding a 21" long Formula-40 pan to his already fine line; and A-FAI, 15" long; B-C, 18" long; and D, 20" long.

Brassel's Speed Equipment, 1215 N. Concord Rd., Chattanooga, TN 37421, (615/892-5995)—Harter's speed pans, mono-line wire and handles.

Bill Pardue described their recent Golden Trial Model Masters Fall Contest in Winston-Salem, NC, on October 22. It seems that Quay Barber's "Lil Shaver" 1/2A profile proto "Put it to" Mike Langlois in the record/ratio speed event. Actually, the profile model was flown on mono-line in the enclosed proto class for a new Junior record.

It is interesting to note that Quay Barber's 1/2A profile on mono-line outran both Bagwell's and Langlois' pure speed models with 3-port mini-pipe Cox engines. Barber was running a nearly stock T.D. with one

The final results in the record/ratio speed event looked like this:

1st	Quay Barber	Jr. 1/2A Proto	97.52 mph	104.31%	94.06 Backup
2nd	Mike Langlois	Open Jet Speed	211.18 mph	102.69%	210.20 Backup
3rd	Quay Barber	Jr. 1/2A Profile Proto	94.06 mph	101.46%	—
4th	Quay Barber	Jr. 1/2A Speed	106.34 mph	98.41%	—
5th	Phil Bagwell	Sr. 1/2A Speed	104.61 mph	94.18%	—
6th	Mike Langlois	Op. 1/2A Speed	106.21 mph	88.00%	—

bypass "flute" very slightly raised, and using the "new Glo Bee 1/2A-insert-type Glo plug. This is the same type plug that Nick used recently to set a new Open 1/2A speed record of 121 mph at the recent Dayton, Ohio meet. Al Stegins was reported to have run a 117-119 with his #2 engine (open face exhaust and Glo Bee plug) and was "really honking" with his 1/2A proto and the #1 engine until the ground jumped up to grab it.

It should be noted that, on the three official flights by Langlois' jet, all had from 1/4 to 1/2 lap of glide included in the clocking. On the 6-oz. non-pressure tank, Mike was getting only 9/4 laps under power from launch, and was getting in the pylon after only 1/2 lap with the ship still on the ground on some of the flights. The 211 and 210 were on 50% propylene oxide and 50% nitro-methane from "Nitrotane." All in all, about ten flights were flown on the same set of valves and "stub" backup valves (same diameter as retainer). Retainer was turned back .050" from stock. That 50/50 fuel was not fed from a pressure tank; it was coming through a metering jet drilled with a #42 drill size. Bill also advises to be careful with what-

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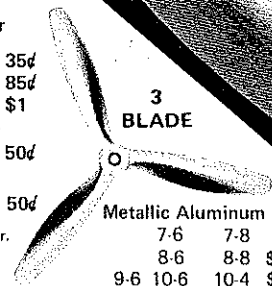
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ever tubing you are using and to watch out for "pin holes."

Bill Pardue indicated he was doing a series of jet articles for "Da Gaz." We have read some of Bill's jet scoop for the Gaz. Encourage all jet speed fliers to subscribe for Da Gaz. It's \$5.00 per year from Doc Jackson, 523 Meadowbrook Circle, St. Davids, PA 19087. Between Doc and Bill, more folks should be getting interested in speed flying again. Hope this is an indicator that speed is on the upswing.

Received a call from A. T. Wright, of Jacksonville, Florida, about the King Orange meet on December 30 and 31, 1977, and January 1, 1978. The weather was fair, rained a little, but not enough to really stop things. Participation was excellent in Free Flight, Stunt, Combat, Goodyear, and Rat. Entries in Speed and Carrier were low. A.T. set a new D speed record under the 78-79 rules at 197+ mph with a mini-pipe. Also, Bob Day and A.T. joined forces to set a 1/2A Profile Proto record at 92 mph.

Would like to find out if Mike Hoyt is still handling jet pipes and heads. Have not been able to contact him... Don't

forget the United States Control Line Model Airplane Championships at Winston-Salem, NC, June 17-18. Everybody that's anybody is gonna' be there. Contact Bill Pardue, 1201 Surry Drive, Greensboro, NC 27408.

In the next column we will cover tach props and what RPM ranges to look for.

Gene Hempel (and Tom Upton), 301 N. Yale Dr., Garland, TX 75042.

### Spitfire/Greene

continued from page 43

bend it into shape. When the 1/4"-sq. leading edges are dry, glue them into place. Glue WT-6 and the top two wing tip assemblies (WT-4 and WT-5) to the wing tip as shown. Let dry.

**Hardware Hookup:** Connect the lead-out wires to the bellcrank and slip the wires through the ribs. Use 3/32" aluminum tubing at the inboard wing tip to protect the wing tip assembly. Glue the tubing in place with epoxy.

Bend 3/32" pushrod wire as shown. Solder it to the bellcrank using a washer top and bottom and install the bellcrank. Solder a nut on the bellcrank to make certain that it won't come apart in flight.

**Landing Gear:** Cut a piece of 1/8" ID brass tubing, as shown on the wing section of the fuselage plan, for the landing gear to slip





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into. The tubing is held in place by the gear clip you made earlier. These pieces should be bolted to rib R-1A using two 4/40 screws. Drill a 1/8" hole 3/8" from one edge and in the slot of the landing gear slot as shown. Position, pin, and glue with epoxy the landing gear block. Solder the gear clip to the 1/8" brass tubing so it won't come out in flight.

**Wing Sheeting:** Now we come to an enormously delicate and critical aspect: covering the wing. Cover it with 1/16" sheet balsa. Use Sigment to glue the leading edge sheeting to the top of the spar only. Be sure the splice (joining the sheeting material) is on the 1/2"-wide center wing rib. When the glue is dry, remove the pins that hold the 1/8" leading edge to the 1" blocks. Then wet the leading edge of the sheeting with water, bend it down over the ribs, and tack-pin it to the 1/4"-sq. leading edge. When the sheeting is dry and has acquired its basic "set," remove the pins. Raise the forward portion of the sheeting carefully and apply Sigment to the top of the ribs and the 1/4"-sq. leading edge where the sheeting will be. Then fasten the sheeting in place with pins and set it aside for the glue to dry.

**Back to the Fuselage:** The fuselage should be dry now, so sand it to shape as shown on the plan. Your sanding-arm should be used to it by now.

**The Wing—One More Time:** When the

wing has dried, remove the pins, including those that hold it to the 1" blocks. Turn the wing over and glue the bottom two tip assemblies (WT-4 and WT-5); pin these in place, and let —em dry.

Glue the bottom sheeting the same way you did the top sheeting. Cut places in the sheeting for the landing gear blocks.

After the glue on the underside of the wing is dry, mark on the trailing edge (TE-2) with a pencil where the center rib (R-1) is to go. Mark both sides—1/2" for conventional fuselage, and 3/4" for built-up profile fuselage. Now install the rib cap strips and put on the center planking as indicated. The wing tip weight will be added later.

**Engine Installation Check:** Test mount the engine using four 4-40 bolts 1/4" long, and four "T" nuts. To ensure zero-degree thrust alignment, remove the glow plug, cut a 12" piece of 1/8" wire and place it between the center cooling fins of the head. The wire will give you a line to eyeball the engine to zero degree thrust. Mark and drill the holes and check them to make certain they fit.

**Tail Assembly:** Next, the horizontal stabilizer and the elevator. Clean off the sanding dust and set the elevator over the plans. Mark on the edge where the elevator horn should go. Drill a straight hole into the elevator to receive the control horn. Cut a channel so that the horn will fit into the

elevators. Test it to make sure it fits well. Now mark the hinge locations. I use an Exacto #11 blade. After making several cuts, pull out the balsa chips and insert the hinge to check the fit. Put some Vaseline on the hinge where it pivots—but *only* where it pivots. Apply Sigpox to the part that goes into the balsa; the Vaseline will not allow the epoxy to stick on the pivot point. Now epoxy the control horn in the elevator and align the horizontal stabilizer and elevator over the plan. Be sure to pin it so it will dry straight.

**Flaps:** Place the flaps on the plan and position the control horn. Then mark the flaps to indicate where the holes should be to receive the horn. Drill the holes, set in the horn, and epoxy it firmly in place. Lay the assembly on the work bench and pin it to keep it straight. Let it dry thoroughly.

**The Wing Again:** Sand the wing smooth with #220 sandpaper, rounding out the leading edges, tips, and all the rest. All butt joints should disappear to the touch. Don't sand the marks on the trailing edge, you'll need them later for reference. Check the flaps; be sure the control horn is dry. The hinges are glued in the same as the elevators were. Slip the flaps into the wing slot in the fuselage and then slip the wing into the fuselage.

**Wing and Fuselage Alignment:** Align the wing in the fuselage by placing a triangle at the leading edge of the wing and against

the fuselage—the wing is straight there. Make sure that the trailing edge marks on the wing are still seen on both sides of the fuselage. Also with the triangle make sure the fuselage is 90° to the airfoil opposite the canopy. Epoxy and let it dry overnight.

Drill and insert two 3/16" dowls as shown. Glue with epoxy or Sigbond. Now put on the bottom fuselage cap (F-6). Glue it into place with Sigment. Glue the flap hinges on the trailing edge (TE-2) of the wing in the same way as you handled the stabilizer and elevator.

**Tail Alignment:** Horizontal stabilizer and elevator are next to be glued into the fuselage. Mark the fuselage width on the center of the leading edge of the stabilizer and insert it into the fuselage, using the marks to make certain it is exactly centered. Glue it with Sigbond. Use the 1/2" triangular piece glued under each side of the stabilizer for extra strength. The horizontal stabilizer should be parallel with the wing. Stand a couple of feet away and eyeball it from the front; align the top of the wing with the bottom of the stabilizer.

Be sure the horizontal stabilizer hinge line is exactly parallel with the wing hinge line. Measure this distance from the hinge line at the tip of the stabilizer to the trailing edge of the wing hinge line on both sides. These distances must be equal or the airplane won't track properly or fly at the proper horizontal altitude.

After the surfaces are straight and true, let the whole thing dry thoroughly. Every hour or so check to make sure that the surfaces are still aligned properly, but give it plenty of time to set.

The fin and rudder are glued on next. Use rudder offset as shown on the plan.

**Landing Gear:** Bend the landing gear shape as shown on the plan, making sure to make a left and a right. Be sure, also, to match the sweep-forward shown on the plan. To fasten the wheels on, slip the wheel over the axle, then a washer, and then take a couple of turns of copper wire around the axle, and solder the wire and the washer to the axle.

Place the main landing gear in the mounts in the wing, using Sig landing gear straps to secure it in place. Bend and epoxy the tail wheel strut on as shown. Secure the wheel the same way as the main gear.

**Connecting Flaps and Elevator:** The easy way to connect the flaps and elevator is with two pieces of 3/32" music wire long enough to overlap each other, about 1" or 1 1/2", as shown. Wrap with copper wire. When pushrods are bent and installed with keepers, flaps and elevators should be set at zero degrees. Solder the pushrod. Put a pushrod bearing about halfway between the elevator and the flaps (see plan).

**Fuel Tank:** Mount the fuel tank on the fuselage using music wire and rubberbands. Use a Sullivan 4 oz. tank (see picture).

**Wing Tip Weight:** With the engine in-

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- FREE OF LEAD HAZARDS—NON-TOXIC WHEN DRY
- SPRAY CONTAINS NO FLUOROCARBON PROPELLENTS
- BRUSHES EASILY WITHOUT BRUSH MARKS

**APPLICATIONS:** Applies to any paintable surface. Since Formula-U does not shrink silkspan or silk products, it is recommended that Aero-Gloss Flat or Gloss Clear be applied first, then topcoated with Formula-U. Brushing Formula-U can be thinned for spray gun application. Colors can be mixed. Use Formula-U Thinner for thinning and clean-up.

**SIZES:** 4 oz. Jar, 1/2 pint Can, 12 oz. Spray Can.

**COLORS:** Brushing and Spray in choice of Hi-Gloss, Metallic and Flat. \*Perfectly match 12 Solarfilm colors.

• RAVEN BLACK	• TROPIC BLUE
• POLAR WHITE	• METALLIC RED
• DARK RED	• METALLIC GREEN
• AVIATION YELLOW	• METALLIC GOLD
• MIDNITE BLUE	• FLAT OLIVE DRAB
• JUNGLE GREEN	• FLAT CAMOUFLAGE TAN
• FIERY ORANGE	• FLAT BLACK
• FLIGHT ALUMINUM	• FLAT WHITE
• BRIGHT RED	• CLEAR

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stalled, turn the airplane over on its rudder and nose. The inboard wing should touch the table. Apply enough weight to allow the outboard tip to flop down on the work bench; the inboard tip will be up. This is enough weight. Lead or solder wrapped with light string makes a good weight; epoxy it to the wood.

**Leadouts:** If you haven't done so already (some people like to get ahead of the plan), wrap the leadouts (see plan).

**Finishing:** After test-fitting the fuel tank and engine—and with the wing tip weight installed—fine-sand the entire airplane to a "baby's bottom" smoothness. Paint it with two coats of clear dope. When both coats are dry and hard, sand the whole air-


plane again with fine sand paper—but lightly. The clear dope over the whole model will keep the wood grain from rising under the covering.

Cut Silkspan to shape over the wing and wet it with water using a mist sprayer. Pull the Silkspan around the leading edges to remove wrinkles. Cement the Silkspan to the wing by applying clear dope to the center planking, leading edges, trailing edges, and wing tips, continually pulling the entire wing, continually pulling to keep wrinkles out. When the Silkspan is dry, paint the entire wing with six (6) coats of clear dope, sanding very gently after each even-numbered coat. Use two to three coats of sanding sealer over the entire airplane to fill the wood grain,



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sanding lightly after each coat.

**Markings:** The roundels on each wing are placed as shown on the plan; the top ones are shown on the inboard side, the bottom ones are shown on the outboard side.

Here's a good, easy way to make them turn out right: using a compass, draw the proper circles on contact paper and cut them out. Starting with the center, paint the area of each roundel on the wing—a little more than the actual area will be on

the finished airplane. Then cover the area with the contact paper mask for the center circle. Seal the edges with clear paint. Paint the next color, again a little larger than the actual roundel will be, and cover it with the proper mask and seal the edges with clear paint. Continue this until the roundel is complete. Leave the paper on until the rest of the Spitfire is painted. Then peel off the contact paper and, presto, you've got a professional job. It may seem faster to do all of them at the same time, but just make sure you put the right color on the right circles.

Paint the canopy a light blue. Add your AMA numbers. Your initials can go on the fuselage.

Paint the bottom of the airplane light blue; paint the top with olive and tan camouflage colors.

**Conclusion:** Both of our Spitfires needed the back plate of the engine filled with solder to be trimmed to fly. In the May, June and July 1976 issues of *Model Aviation* Chris Lella tells a lot of your airplane's actions and problems in the articles on balancing for roll, yaw and pitch on control line stunt ships. These are quite good and should be read by every control line flyer.

The models described in this article are both capable of doing the complete AMA pattern without any problems. With either of them you have a worthy addition to your stable of aerobatic and mock-combat champions.

## 52nd Nationals

*continued from page 53*

Charles Nats has this been possible.

It all adds up to a lot of enjoyment and the most economical conditions for a family oriented Nats.

Further food for thought: it has become harder and harder to put on a Nats due to cost and complexity factors; so much so that there has been increasing talk in recent years about discontinuing the Nats, or changing it significantly, to make it more manageable. This might be the last opportunity to enjoy a Nats in the classic tradition. If so, Lake Charles offers the best combination of factors to make the trip worthwhile.

If you were ever inclined to go to a Nats, this year's is recommended as the one with the most to offer from a facilities viewpoint. Lake Charles is the only known site in the country with so much so ideally suited to a Nats. Thus, the stage is set once again for AMA to put on the world's biggest model meet. *You are invited!*

## FF Duration/Meuser

*continued from page 55*

(b) tickle their funnybones. This applies to getting people to tell you about it when they find your lost models.

# Nats Entry & Meeting Information

**Advance Entry** (by mail) savings are big, and the Basic Fee is refundable if you don't show at the Nats, so this is the best bet. The advance entry postmark deadline is July 3.

**Late entries** will also be permitted at the contest site during the Nats period. The primary requisite for all events is that late entries be accomplished before various stages of preflight processing for the events concerned, in accordance with the Nats entry form schedule, particularly concerning Scale model turn-in and transmitter processing.

**Entry Form.** The full schedule of event flying, plus Scale turn-in deadlines and RC transmitter processing times, is printed in the Official Nats Entry Form Instructions. Anyone who thinks he might enter should obtain the 1978 Nats entry form which also includes much other useful information; available upon request from AMA HQ, 815 Fifteenth St., NW, Washington, D.C. 20005. Please include a stamped, pre-addressed envelope. The AMA HQ offices at Chennault Air Base in Lake Charles will be open for registration and late entry from July 30, basically 8 am to noon and 1 pm to 5 pm each day; also by noon each day at the indoor site.

**Late Basic Entry Fee** for Juniors and Seniors is \$5 (same as advance fee, and includes entry in one event) and \$40 for Open members (no event included). Event fees for late entries, or for events added at the Nats by advance entrants, are \$5 per event for all age categories—except RC, which are \$10 per

event.

**Mechanics Fee,** advance or late, is \$5; provides identification and field access privileges equivalent to contestants.

**Nats Housing.** University dormitories are available. The rate is \$5 per person per night, double occupancy. Children who do not occupy a bed (but use a sleeping bag, for example) will not be charged.

**NATS MEETINGS.** The regular AMA general membership meeting as provided in the AMA by-laws is scheduled to be held at the Nats' on Wednesday, August 2 at 6:00 pm; all members are invited.

**The Nominating Committee,** open only to AMA vice-presidents or their appointed delegates, will meet on Wednesday, August 2, at 8 pm. The beginning of this meeting signals the closing time for AMA officer nominations (President and Vice-Presidents for District 2, 4, 6, 8, and 10 for the 1979-1980 term). See the "AMA News" section of this issue for nomination procedures.



## NEW NATS TROPHY POLICY

Awards will be provided to at least three places in every Nats event for Juniors and Seniors, as well as Open contestants. In addition, more awards may be available, depending upon the number of advance entries in each event. Thus, if there are 10 advance

entries in any age group in any event, there will be at least five awards. In addition there will be one award for each ten advance entries beyond the first ten. Example: 21 advance entries = six awards (five for the first 10, plus one for the second 10).

## JUNIORS AND SENIORS

Juniors and Seniors will receive awards in the same manner as for Open (adult) age entries, as a means of encouraging youngsters to compete at the Nats. Juniors and Seniors this year get free entry to one Nats event upon payment of the basic fee. Thus, while Open contestants have to pay a \$20 basic fee, plus \$3 per event (\$10 per RC event), Juniors pay only a \$5 basic fee and no event fees unless they enter more than one event. The same is true for Seniors except that the basic fee is \$10.

Juniors and Seniors should know, too, that there is no late entry penalty fee as there is for Open entrants. The latter have to pay \$40 (!) for late entry (after July 3) whereas the fee stays the same for Juniors and Seniors no matter when they enter.

There are over 60 events at the 1978 Nats which can be entered by Juniors or Seniors. With the special policies for these age groups, this year's Nats can be a happy experience for youngsters. To find out more ask for a free Nats entry form—send a stamped, self-addressed envelope to AMA, 815 Fifteenth St., NW, Washington, D.C. 20005.