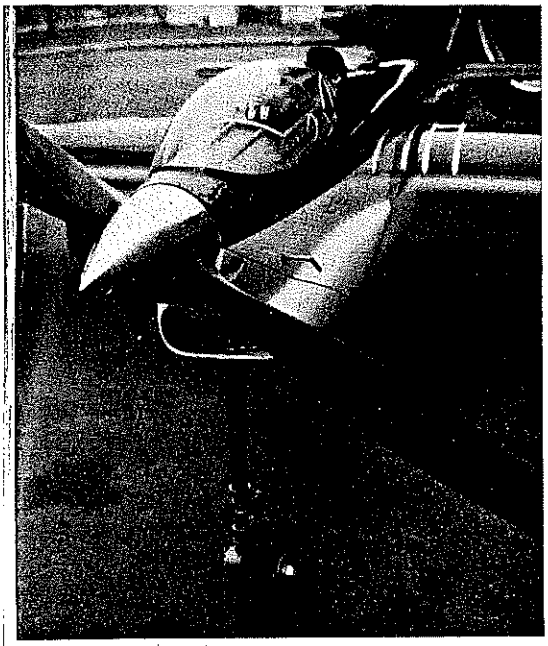
SEMISCALE model jet airplanes have always fascinated me. I have designed and built several, including a Blue Angels' and an F-16 Thunderbird. The MiG presented here, however, because of its theme, composition, and character, has proven itself worthy of distinction beyond my past creations. In particular, its red and white aerobatics paint scheme and its awesome dimensions make it stand out vividly among other Stunt ships of conventional proportion.

Windy Urtnowski

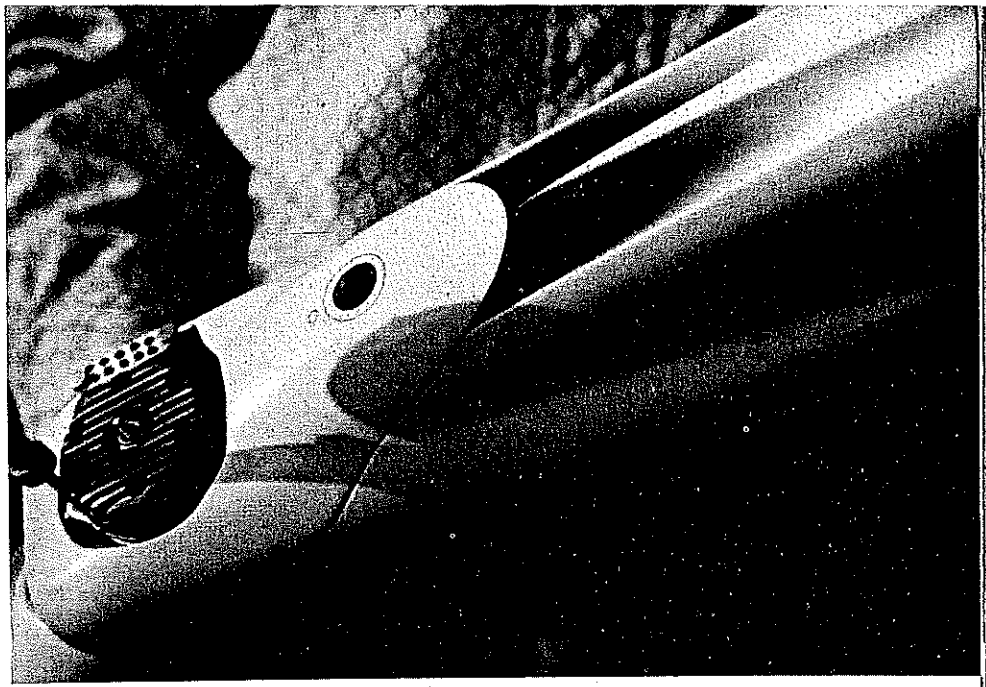
MiG Sweeper

546

Above: Styled somewhat after a Russian aerobatics plane, the lines of this model can turn heads almost as fast as it can turn square corners. Note the rudder strakes and scoop behind the canopy. Below: The slick finish comes from several coats of paint and a good waxing.



With everything concealed neatly up front and with its cockpit detailing, the spectator appeal of this bird goes almost unchallenged. Nose strut bolts directly to engine.

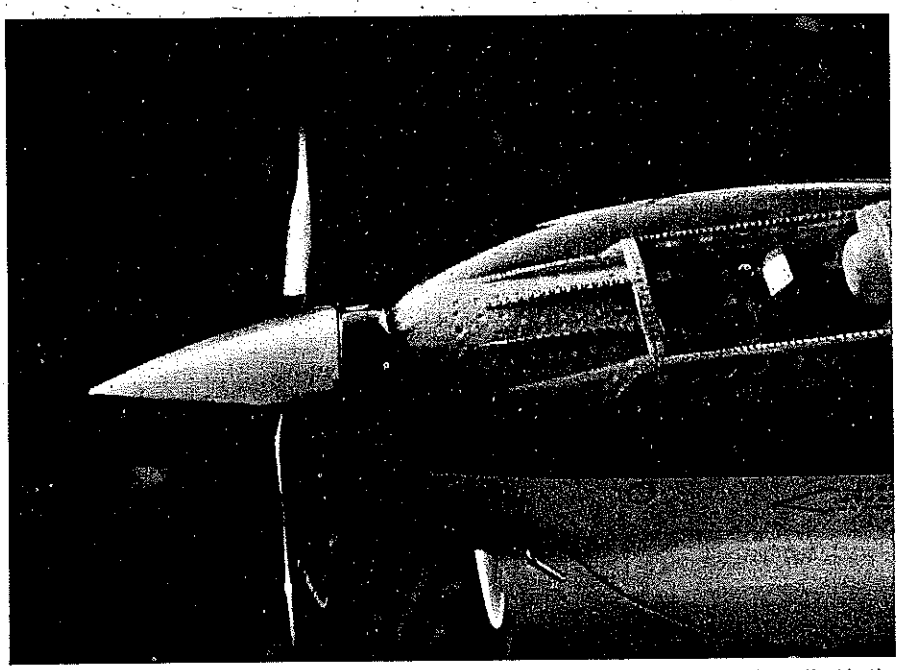


Blast from handmade muffler exits out the bottom of the cowling. Hold-down bolts are recessed and surrounded with brass tubing for long life. Blacked streaks add to the illusion.

Most of us can remember the plane that got us "on the step" and turned us into the kind of pilots we wanted to be. If Control Line Precision Aerobatics is your ambition, meet your new teacher.

The MiG is an outgrowth of Big Jim Greenaway's aerodynamic technology in conjunction with my own cosmetics. It is indeed an incongruous facsimile of one of the representative flying units of the U.S.S.R. Aerobatics Team. This ship's large flap area, airfoil design, moments, and power setup, though, result directly from Big Jim's research, extensive testing, and overall Stunt experience. The actual construction, including canopy detailing, painting, and aesthetics, is my own.

Aside from the MiG's massive but streamlined appearance, its flight performance is impressive The ship tracks like an arrow in level flight and corners hard through 90°-plus maneuvers. That's an impressive combination. Add to this the charm of a full-house canopy, scoops, flashy paint, and a good hot .60, and you've got a package of harmonious components that is certain to bolster your level of confidence right away and ultimately your flying skill.



The detailed cockpit (an added nicety) is first constructed as a unit and then installed in the plane. Rivets are simulated with a Dremel tool, and the seat belt is made from a shoelace.

Construction. Although the plans reveal a built-up type of construction, the MiG easily can be duplicated from foam components. I've built several foam ships of

The MiG takes off on a sortie in search of the 1983 Walker Cup. Our author says he will always have a soft place in his heart for this plane since it was the first to take him the Walker Flyoffs.

Windy and Big Jim Greenaway combined technologies to create the MIG. The foam-wing prototype, right, was built to work out the kinks and evaluate the aerodynamics on the MiG.

similar design, and they all have performed exceptionally well, to say nothing of the time saved in the building process. Built-up or foam construction, the MiG promises its builder a genuine adventure in Control Line Stunt.

I prefer D-tube construction for rigidity and also to convey the appearance of a traditional Stunter. The wing has blunt leading and trailing edges which will favorably retard acceleration and whip under windy conditions. The structural bluntness does induce undesirable parasitic drag, however, and a high-output Stunt engine is required to overcome that.

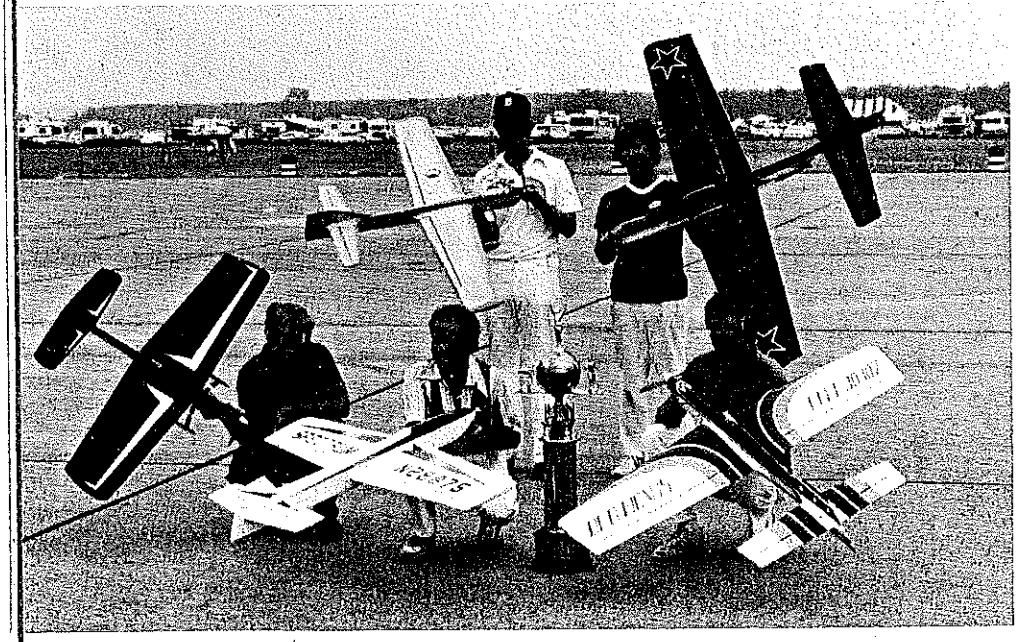
The cockpit is assembled separately in a small box, then inset through the top block after the surrounding fuselage area has been completed. Additionally, a coat of aluminum/zinc oxide provides an interesting effect and truly enhances the cockpit. A clear (or tinted) canopy rounds out the motif. A hollow block could easily be used in lieu of an intricate cockpit and canopy, but when time conservation is not of particular importance, attention to detail becomes a priority for me.

The cowling is carved around a bottom-exhaust muffler machined from a solid block of aluminum. The muffler is totally hidden from the onlooker's view and adds to the semiscale appearance of the MiG. Functionally significant are the air exits beyond the cowl line and 1/16 rolled balsa tube exhausts behind the flaps. The air exits are very efficient, and there has never been a problem with overheating. The tubes also add structural support to the fuselage.

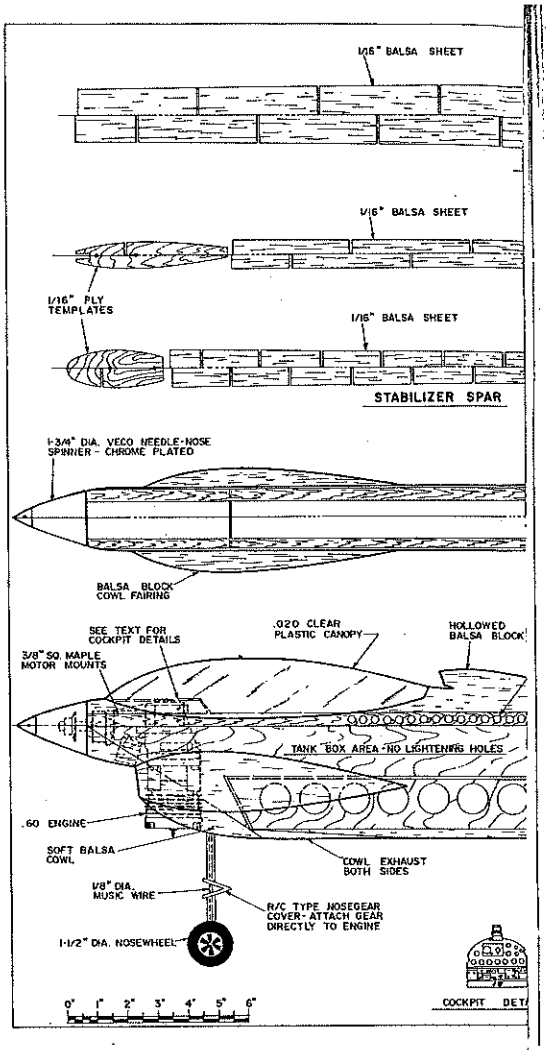
I prefer to assemble the wing and tail surfaces first, cover both, and take them up through the filler coat stage of finishing before beginning the fuselage. Obviously, it is easier to sand, fill, etc., smaller components individually than the entire fully-assembled unit. Since a small workshop (like mine) can be a hazard to large airframes during construction, this procedure limits dings, dents, and unnecessary blemishes that would occur.

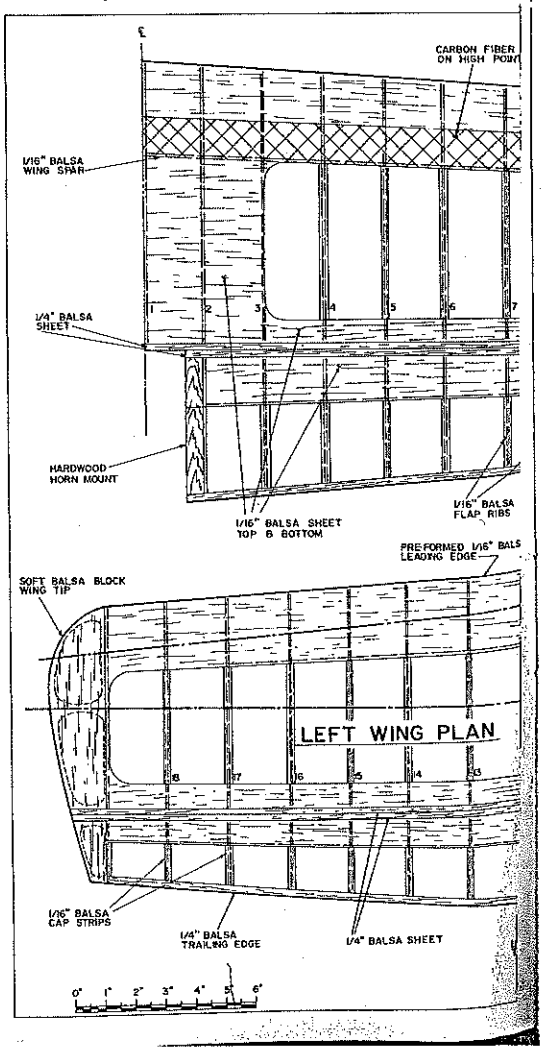
Wing and tail components must be built

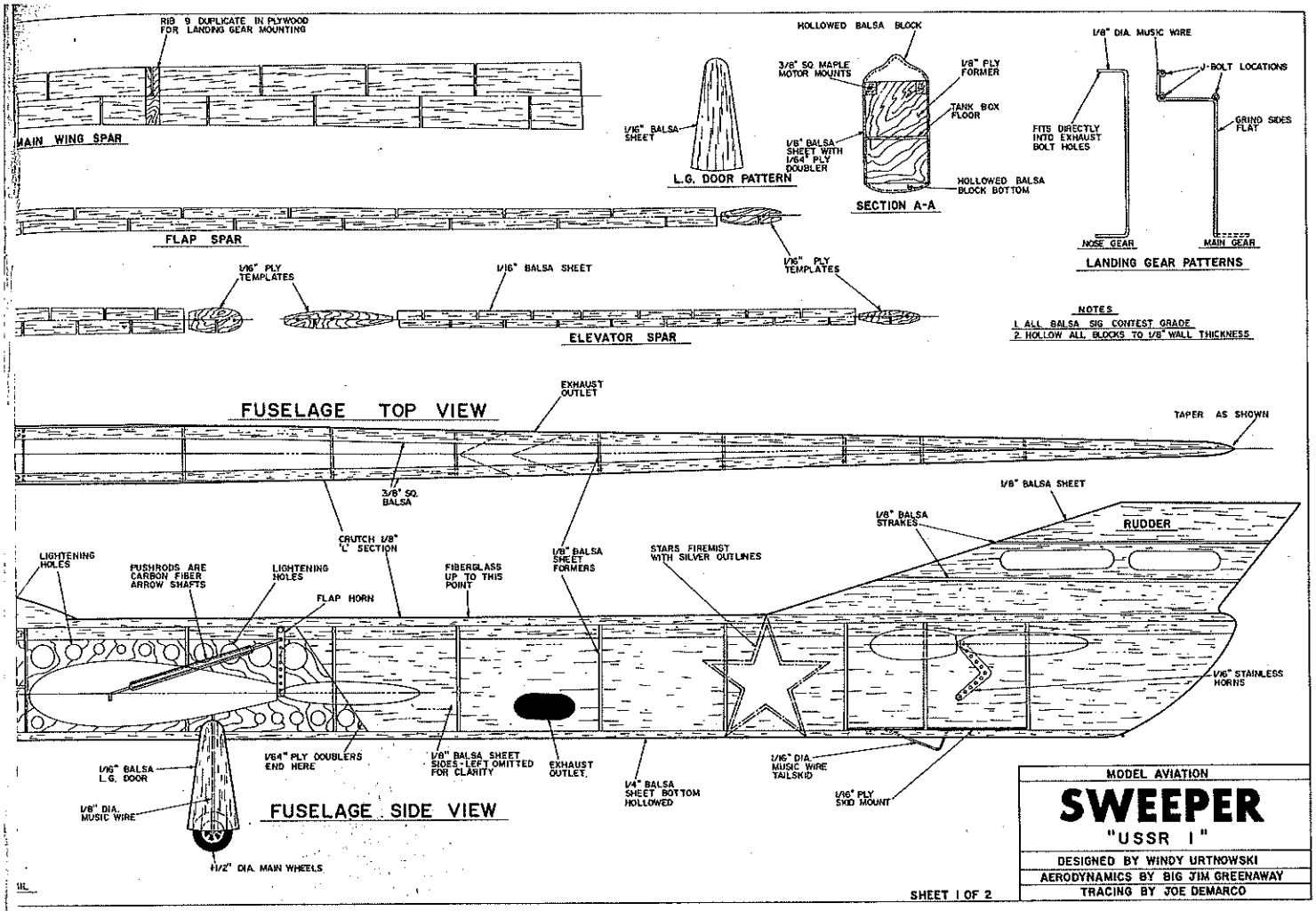
Continued on page 164



Our author and the MiG placed 5th at the Chicopee Nats in 1983. Note the size of this model compared to the other four finishers. This is the kind of model that makes good Stunt pilots.







MODEL AVIATION

SWEEPER

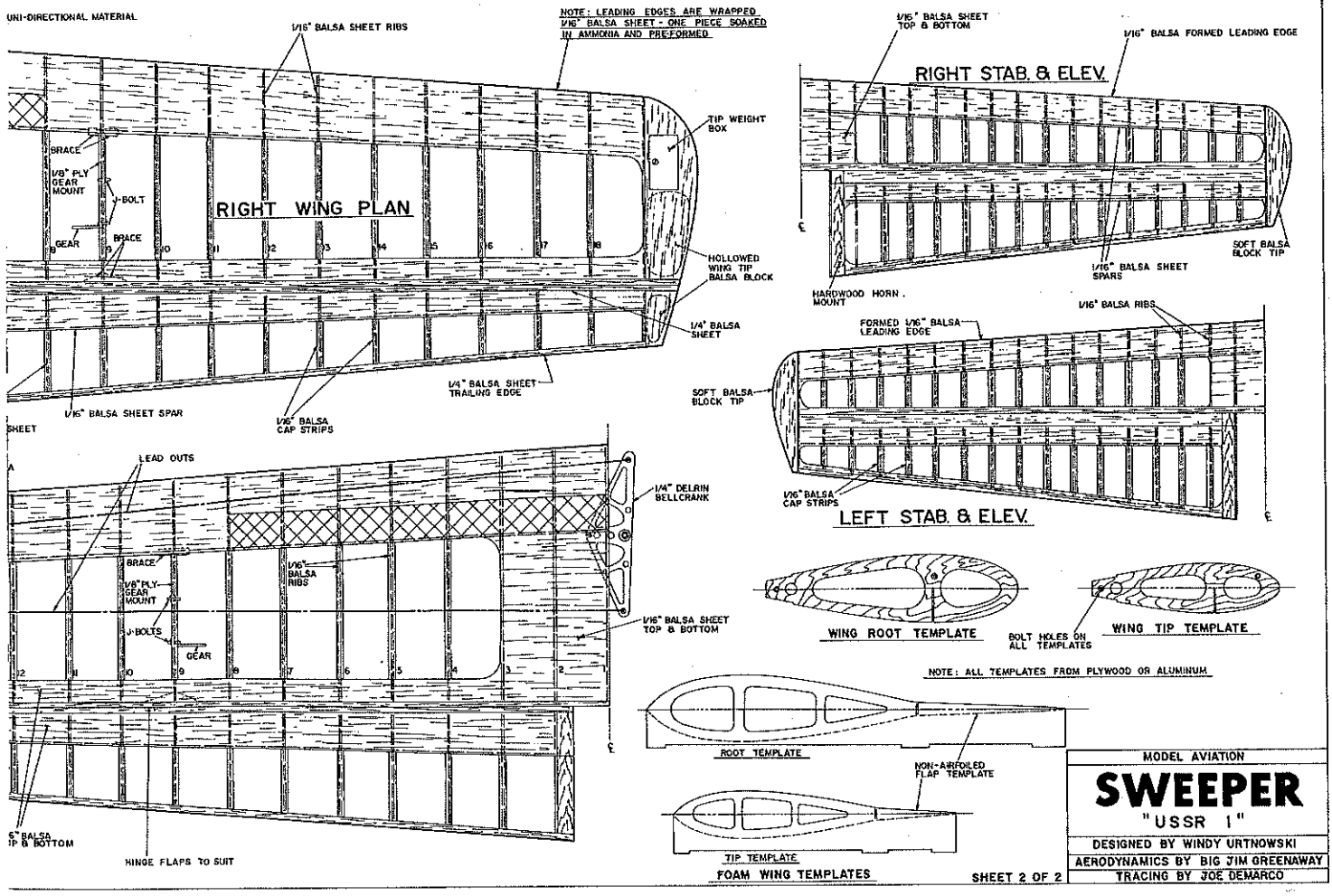
"USSR 1"

DESIGNED BY WINDY URTNOWSKI

AERODYNAMICS BY BIG JIM GREENAWAY

TRACING BY JOE DEMARCO

SHEET 1 OF 2



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SHEET 2 OF 2

ing. I need all the help you can contribute to this Speed column. I challenge any of you to mail something of interest to *Model Aviation*. If it pertains to Speed or related items, please mail these to me. I would appreciate your help for I am still waiting for those who have previously offered their help but have not followed up on their words of wisdom.

*** The following are the addresses** of the companies mentioned in the article:

Sagan Industries, Inc., 36-14 35th St., Long Island City, NY 11106.

Model Research Labs, 24692 Nympha, Mission Viejo, CA 92691.

McCollum's Prop Shop, 21842 Bass Lake Circle, El Toro, CA 92630.

Gene Hempel, 301 N. Yale Dr., Garland, TX 75042.

MiG Stunt/Urtnowski

Continued from page 71

straight and true. A flat building surface is imperative. I cover my work area with a sheet of ½-in. plate glass shimmed perfectly flat with computer card stock or ordinary playing cards. The plans can be conveniently placed under the glass where they are clearly visible and be totally free from residual glue and debris. As the glass is very resilient to glue adhesion, it cleans up nicely.

At this point gather enough 1 x 3 x 36-in. balsa planks to build box perimeters in which the wing, flaps, stab, and elevators will be constructed. Use a straightedge and strip the top and bottom edges of the planks to ensure straightness. Scribe a line 1½ in. from the bottom edges of each plank which will eventually serve as a guideline for the leading and trailing edges and end ribs. Build a box perimeter for the wing, another for the stab, one for the flaps, and one for the elevator. (Both flaps can be built from the same box, likewise for the elevators.) I build the wing first, then the stab, and finally the flaps and elevators, but this sequence is merely a matter of preference.

Tack-glue the appropriate box to the work surface, and then tack-glue the leading edge, trailing edge, ribs, and hard balsa spars (where applicable) in place. Apply sheeting and cap strips to all the top surfaces. Carefully cut the box free of the glass, flip it over, and tack-glue it in place again. Repeat the process for the bottom surfaces, rechecking all centerlines before sheeting and cap stripping. (For the wing, install the bellcrank assembly before sheeting the bottom.) Carefully cut the box away from the completed assembly. Block-sand where necessary, shape and hollow the tips, temporarily install hinges, etc., and work in the filler coat in preparation for covering. This procedure renders very straight and accurate wing and stab surfaces. It's also relatively easy and progresses more quickly than it might appear from the description.

Fuselage. Matched sides of moderately dense balsa with straight grain work best. Install plywood doublers, engine mounts, and formers according to the plans. Provide for the engine and tank installation, shape and hollow all blocks, and build the fin according to plan specs. For a rigid, torque-resistant fuselage, leave at least a ⅛-in. wall when hollowing the blocks. (To relieve excessive vibration, 1/16 plywood doublers and ½-in.-sq. hardwood mounts can be substituted for the 1/64 plywood doublers and

⅜-in. hardwood mounts as specified on the plans.)

Final assembly. Assemble the wing, stab, and fuselage sub-assemblies, including all hardware components. Carefully align the wing and stab with the fuselage. Tack-glue and recheck before permanently bonding these parts. Attention to proper alignment is critical; the price for not doing so is an incredible headache when trimming the model. Duplicate the control system from the plans using ⅛-in. music wire control horn shanks.

Finishing. Fortify fuselage strength with a layer of ¾-oz. glass cloth and epoxy resin out to the trailing edge of the wing. Cover the remainder of the fuselage with lightweight silkspan. Apply fillets and proceed through the filler coat stage. (For the filler coat, use a mixture of one-third talc, one-third clear dope, and one-third thinner.) Sand off most of the filler coat using 320, then 400-grit wet/dry paper (used dry). Seal the filler coat with a light coat of clear, let it dry 24-48 hours, sand lightly with 600-grit wet/dry paper (used dry), and then spray one coat of silver over the entire airframe. (The silver coat will accentuate imperfections which can then readily be repaired.) Spray the base color and let dry for 24 hours. Mask and spray the trim colors, and apply ink lines and rub-on transfers.

Spray three coats of clear dope thinned 50% over the entire ship. Dust on the first of three coats to prevent the dope from dissolving the rub-on transfers and attacking the ink lines. A moderate second coat and a wet third coat will produce satisfactory results. After applying the third coat, let the model sit for two to three weeks to allow trapped solvents to dissipate. Then wet-sand with 600-grit paper, clean and degrease surfaces with DuPont Prep-Sol or rubbing alcohol, and apply three more wet coats of clear. Again, let the model sit for two or three weeks, wet sand with 600-grit paper, and rub out the finish with a fine-abrasive rubbing compound. Culminate the project with a light coat of your favorite wax.

Flying. The best attribute of this model is its ability to build confidence, especially for the pilot who is used to mediocre ships which are frightening to fly under windy conditions. Begin with extra tip and nose weight until you become acquainted with this ship's cornering potential. My MiG ultimately performed best with 3 oz. of tip weight, no additional nose weight, and an A.H.M. 13 x 6 prop (for windy weather) or an A.H.M. 12 x 6 (for calm conditions). Also, as a matter of preference, I use 70-ft. solid control lines of .014 diameter and a fully-adjustable handle to achieve the particular feel and fine control tuning which suits me.

The MiG is a fun Stunt ship for both the competitive expert and the not-so-aspiring sportsman. For sentimental reasons, it is

special to me: it was the first ship that got me into the Walker Cup flyoffs. I feel it's quite a package of bold appearance, style, and aerodynamic soundness. The MiG is a contest-proven, high-performance machine for the serious competitor, or it is simply a crowd pleaser for the weekend exhibitionist. It's an interesting building project, a spectacular product to behold, a great performer, and an incredibly delightful companion.

The aerodynamics of the MiG - USSR 1 set this ship apart from the rest. Its high-aspect wing is the result of years of development by pioneers like Jim Greenaway and Denny Adamisin. Their ideas in high-aspect technology paved the way for my MiG, and I thank them for their work The MiG is a product of their leadership by a a dedicated New Jersey disciple.

Handle/Jennings

Continued from page 72

see in grass doesn't go unnoticed by us over-40 pilots.

The real subject of this article is improving the Sullivan/Pylon Brand handle, so start off by buying one at your local hobby shop. When you get home with it, cut and remove the lead-outs and discard the tang that holds the lead-outs in position. File all the plastic molding flashing and injection points smooth in the hand-grip area. Some handle halves may not be fully bonded together. Use epoxy to fill in such areas. Wipe the epoxy smooth before it gets hard if you want to avoid sanding it later.

The photos really tell the story. Only not-so-obvious items will be discussed in the text.

Wire rope can be difficult to locate. In the aforementioned article by Wynn Paul, a good suggestion was made to use wire rope from a motorcycle control cable. Be sure that it is strong enough. Also, industrial supply houses usually carry small-diameter wire rope. Another supply source is the maintenance area of your local airport. The wire rope I used is stainless steel of 3/64 in. dia. and 7 x 7 (seven strands with seven wires per strand).

The other item is the copper splicing sleeve for the wire rope. It must be for the correct diameter of wire rope being used. However, these sleeves are not absolutely essential, as a lead-out end made as per the AMA rule book will do an acceptable job.

It may be either soldered or epoxied.

Drag mechanism dimensions are shown on the sketch. The mechanism is made from a 1/16-in. piece of steel plate. When you have the steel, clean it, lay out the lines, and lightly center-punch the four hole locations; do all of this before cutting out the 1/4 x 2 1/8-in. rectangle. Drill the holes, then remove any burrs. Now cut out the part from the steel plate and remove all sharp edges with a hand file.

The part is ready for the 90° end bends—which must fit into the slots in the handle. Make the bends by putting the short end in a vise and swinging around the long end. Once both ends have been bent this way, some minor additional bending will probably be needed to fit the handle slots. The drag mechanism should fit flush with the handle when everything is correctly bent.

Remove the drag mechanism and check both ends for hairline cracks which may have been created in the bending process. If you find even one, throw away the part and make another. Should the second one crack while being bent, apply heat while bending the third one; this should help eliminate the cracking problem.

Slip the cable through the drag mech-