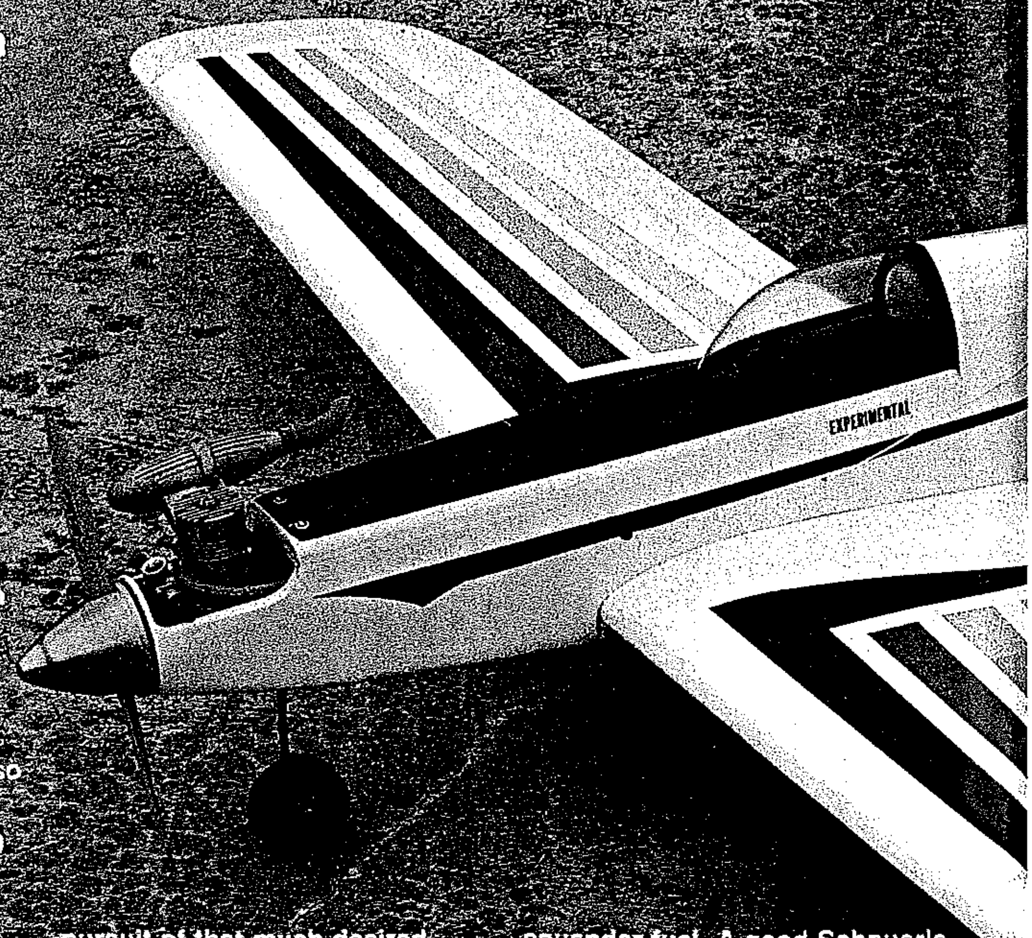
Gimlet 40

If you've been looking for an "honest" Pattern trainer that won't break the bank with fuel costs, give a good look at this one. It's for .40 to .50 two-cycle engines and four-channel controls.

■Joe Geiger



PRACTICE, we so often hear, makes perfect. If it's well-made maneuvers we seek, however, no amount of practice will lead us to the promised land with an airplane that isn't capable of consistent performance. An honest aircraft will track well through all maneuvers and follow control input precisely, so that practice will result, if not exactly in perfection, at least in progress. Any sport flier who loves loops, rolls, spins, and figure eights, and who wants to advance to pattern-quality maneuvers either for competition or for personal pleasure, needs such an honest craft.

So far, so good. The trouble is, when we reach this level of readiness there's a tendency to purchase a kit of one of the very successful competition models—which invariably requires a high-performance .60 and a tuned pipe. We build the model, get to know the idiosyncrasies of the pipe, and settle down to serious practice—only to be taken aback by our plane's prodigious appetite for fuel (two cases a month, if you practice regularly).

Is this really necessary? In pursuit of that much-desired mastery, must you fly an airplane which regularly requires gargantuan quantities of liquid energy to be poured down its throat? Unless you're at one of the higher levels of competition, probably not. If, like most sport fliers, you're preparing for Novice or Sportsman competition, or simply trying to master an airplane for your own pleasure, the Gimlet .40 is a sensible alternative to more high powered, expensive-to-fly models.

Here's an airplane that doesn't compromise on performance, and, given a reasonable selection of engine, doesn't squander fuel. A good Schnuerle .40 with a stock muffler is all you'll need for dazzling performance. The Gimlet tracks well through all maneuvers, does the full repertory of patterns—and is so much fun to fly that you'll look forward to going out to practice. Moreover, it's a straightforward model that doesn't require exceptional skills or unconventional materials to build.

The wide-track tricycle gear on this airplane makes ground handling a breeze—even when one is blowing. The Gimlet isn't a beginner aircraft, though, but is designed for those who've reached a certain level of skill. If you're proficient with ailerons and have mastered an advanced trainer with a symmetrical airfoil, you'll be surprised at how easy it is to fly—and how good you look when you fly it. (A big smile makes anybody look better.)

Construction

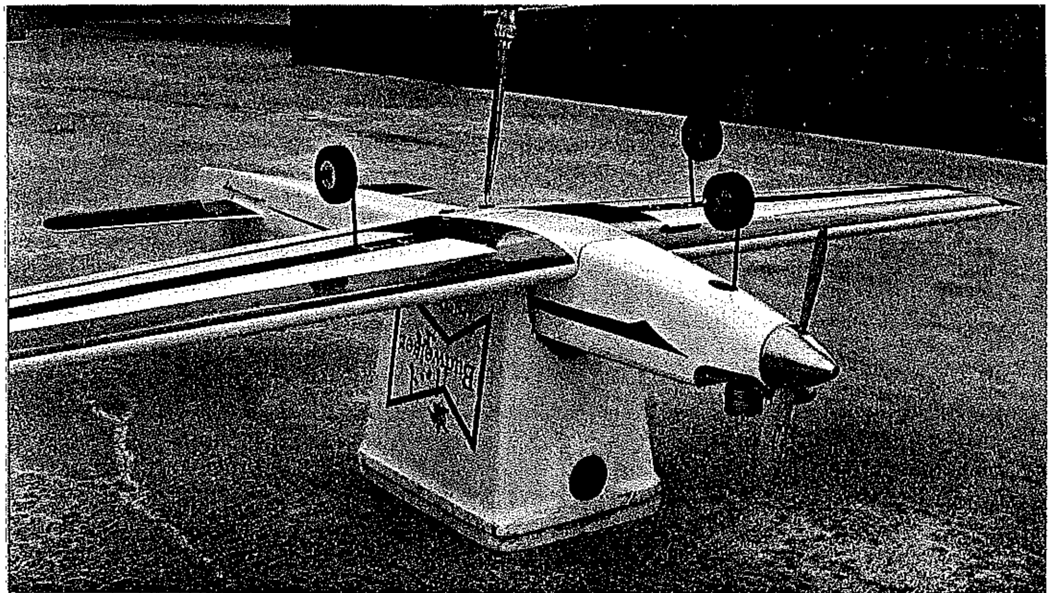
Wing and fuselage. Assemble your materials, and cut out the ribs, bulkheads, fuselage sides, and empennage. Drill the firewall (F1) for your engine mount, fuel lines, nose gear steering, and throttle cables. Mark the center of each rib at the leading edge, and draw a centerline down the length of the leading edge stock.

After checking your building surface with a straightedge to make sure it's absolutely flat, attach the wing plan and cover it with waxed paper. Since you will be building the wings upside-down, begin by pinning the top spar in place over the plans. It's helpful to check the alignment of the spar with a straightedge, then angle your pins so that they won't be trapped when the bottom spar is glued in place.

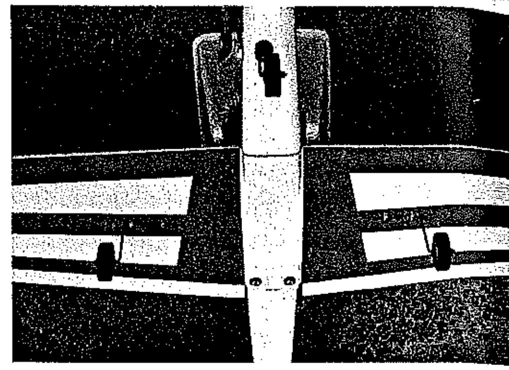
Using a small square, tack the ribs in place with cyanoacrylate glue (CyA). Rib 1 should angle out 1/64 in. to allow for the slight dihedral. Install the bottom spar, check the alignment by placing a straightedge on it, then tack it in place with CyA. Matching up the centerline on the leading edge with the center marks on the ribs, tack glue the leading edge in place.

Glue a shear web between ribs 1 and 2, then attach plywood doublers to the shear web and

Big Picture: With lines reminiscent of Control Line Stunt ships of the Fifties and performance that is steady and accurate, this design brings the past into the present in a beautiful aerobatics way. Above: As the shadows stretch out long and the sun goes down, our author, Joe Geiger, fuels up for "just one more flight."



A small, inexpensive picnic cooler makes a useful stand for assembling the low-wing aircraft. This cooler was bought at a garage sale for only 50 cents. All photographs by the author.



An extra-wide tricycle gear gives excellent ground handling characteristics and the best of landings and takeoffs. The main landing gear is anchored to hardwood blocks in the wing by means of metal straps and screws.

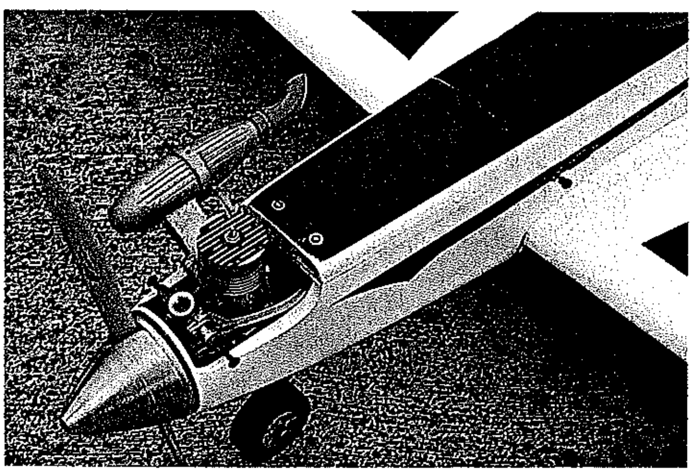
the rear of the leading edge. Drill ¼-in. holes for the wing mount dowel (a long drill bit is preferable), but do not install the dowel. Center each rib on the ¼-in. trailing edge, and tack with CyA. Install the remaining shear webs with the grain running vertical, then remove the pins, lift the structure, and reinforce all joints with medium-strength CyA. A kicker like Hot Shot speeds this process along.

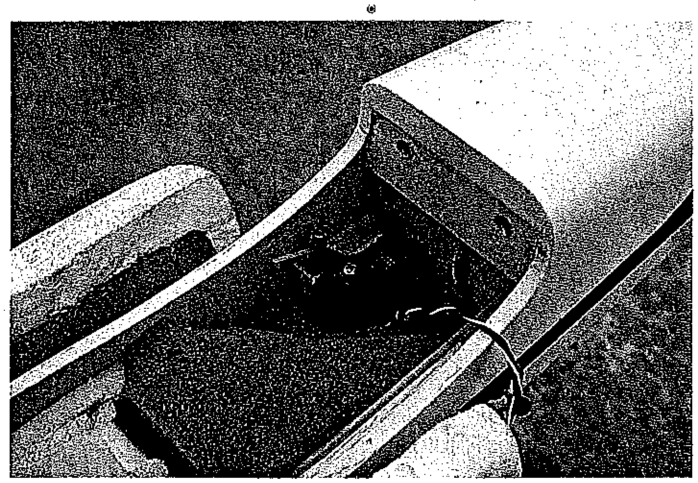
Pin the top trailing edge sheeting on the plan; pin the wing structure over it, and glue with CyA. When this has fully set, remove the pins and glue the bottom trailing edge sheeting in place with slow-setting CyA. Use a 30-in. length of *straight* 1 x 2 wood to hold the assembly against your flat building surface while the CyA sets. Hold this for a timed two minutes to ensure that the trailing edge is perfectly straight.

Cut the leading edge sheeting to fit, then run a bead of medium-strength CyA on the tops of the ribs from the leading edge to the spar and along the front edge of the sheeting. Place the front edge against the rear of the leading edge, allowing the CyA to grab while you run another bead along the top of the spar, then roll the sheeting down onto the spar. Hold it in place with the straight 1 x 2 board until the CyA has set. Repeat the same process for the other side.

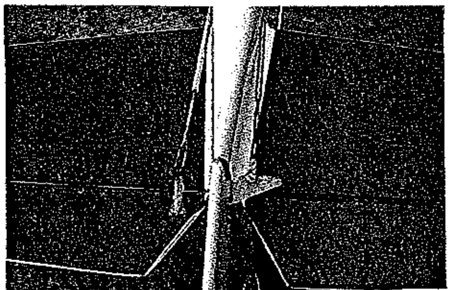
Assemble the landing gear blocks, glue them in place, and reinforce the ribs with ply doublers where they join the blocks.

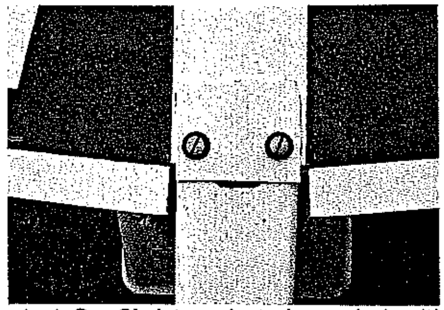
Sheet the top center section of the wing, but leave the bottom center sheeting off until the wings are joined and the dowel holes have been located in F3. Shape the leading edge, and build the other wing to this point. Join the wings with 1 in. dihedral at each tip rib. When the wing joint is secure, reinforce the top center area with a 6-in.-wide

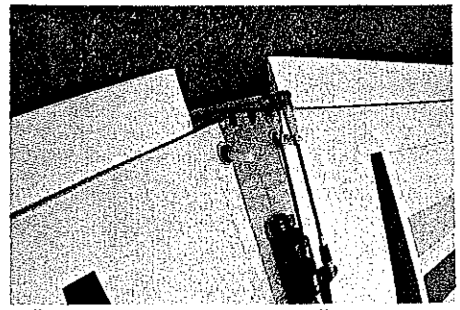




Left: There's plenty of room up front for a .45 or .50 engine, but this small Fox .40 does an excellent job because there's more than 600 sq. in. of wing area with only about 5 lb. of flying weight. Right: Author says the stiff monofilament line used in grass trimmers is an excellent throttle control rod when run inside nylon tubing or Gold-N-Rod inners. Empty space has been filled with lightweight, shock absorbing foam.



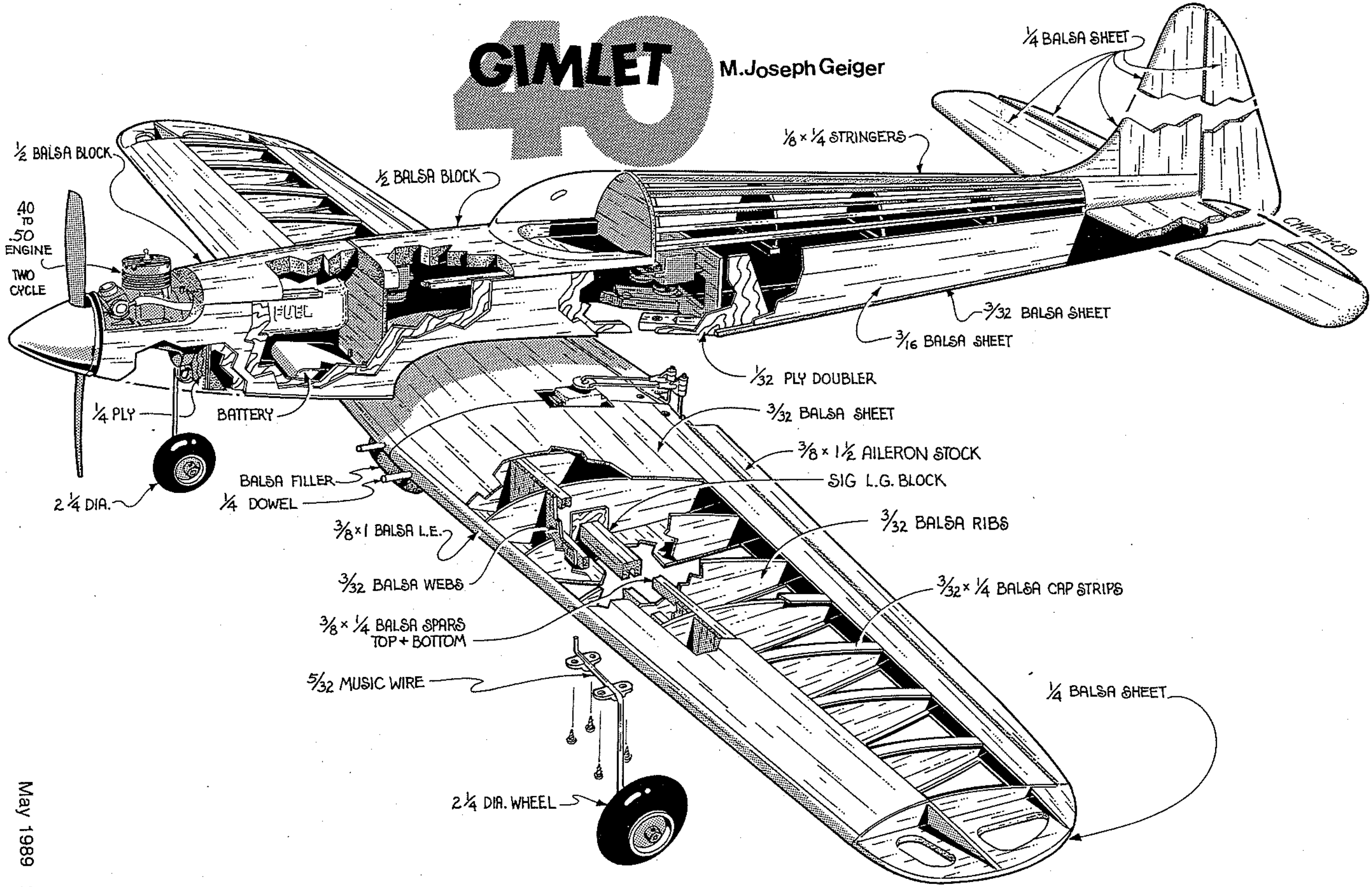


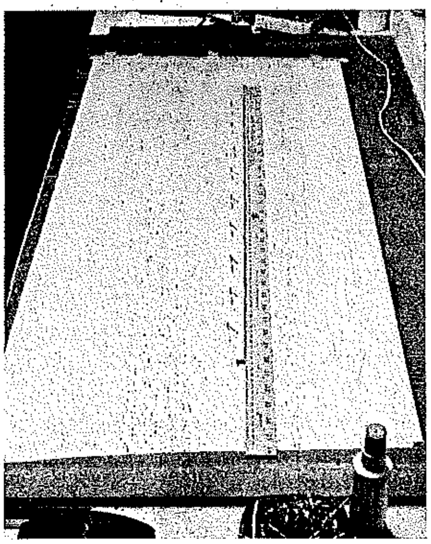


Left: Small clip on the new Sullivan clevis is important. One Gimlet was lost when a clevis with no clip opened during a violent pullout. Yellow inner Gold-N-Rods serve only as bearings for solid steel pushrods which run all the way to the servos where they are attached with Z-bends. Center: The fuselage will need to be relieved so the aileron controls will not hang up during assembly. Washers under the wing mounting nylon bolts are common faucet washers that have been drilled out. Right: Wing mounting bolts are captured with nylon washers and small O-rings. In this way the bolts stay with the wing when it is removed. Pivoting aileron horns prevent binding, even though the trailing edge sweeps forward.

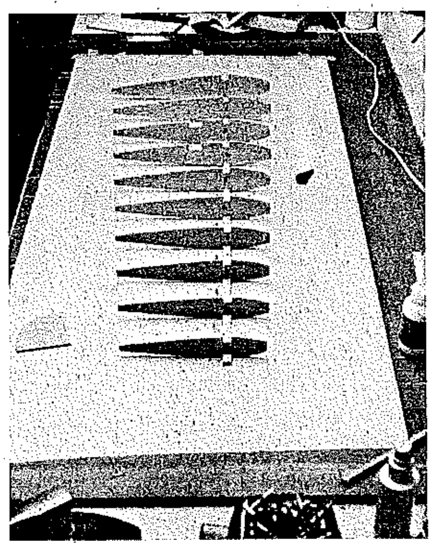
GIMLET 40

M.Joseph Geiger

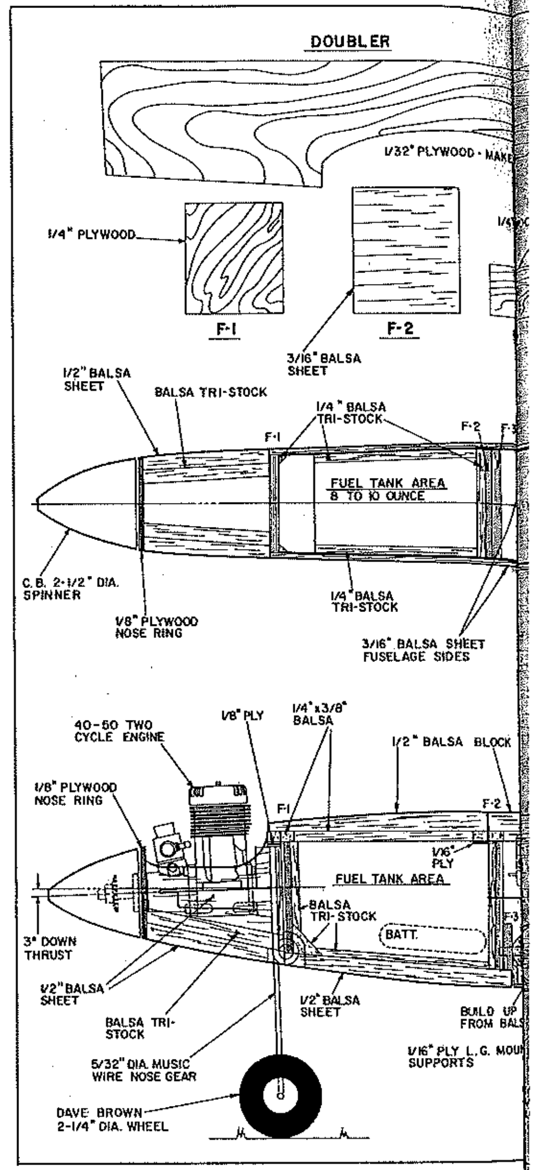




The wing is built upside-down. Begin by pinning the spar in place. Employ a straightedge. You want to assure straightness in every step.



Tack glue the ribs in place; align with small square. Angle out R-1 $\frac{1}{16}$ in. for dihedral.



strip of fiberglass adhered with thin CyA. Set the wing aside, and proceed with fuselage construction until you are ready to adjust the wing seat.

Fuselage. Laminate F2 and F3, then laminate the fuselage side doublers (being sure to make both a right and a left) to the fuselage sides. The doublers should be inset ¼ in. from the front of the sides, assuring that F1 will be glued to the balsa sides and *not* to the ply doublers.

Carefully mark the centers on both the top and bottom of each bulkhead. Laying the sides on your building board with the doubler sides facing up and the tops butted against each other, mark the former and brace locations on both sides at once. Using a triangle to make sure the bulkheads are perfectly vertical, glue F2, F3, and F4 to one of the sides. Place the assembly over the top view (top side down), and glue the second side to these three formers.

Pull the fuselage sides together at the tail over the centerline of the top view, checking alignment as you proceed, and then glue. Use bricks, weights, pins, jigs, curse words or whatever is necessary in this step, but just don't build a banana! If alignment isn't perfect the first time, break the joint apart and redo it.

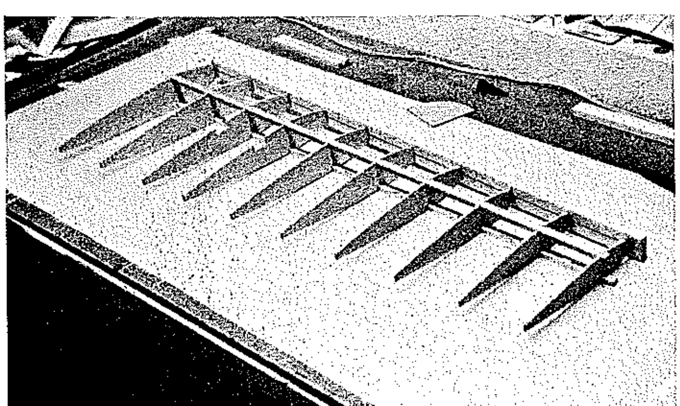
Using the same care that brought the tail together, center F1 between the sides, and glue with epoxy, Flex Zap, or Special T. Accurately position the remaining crosspieces, and glue them in place. Glue the wing mount blocks in position, reinforcing them with small pieces of triangular stock.

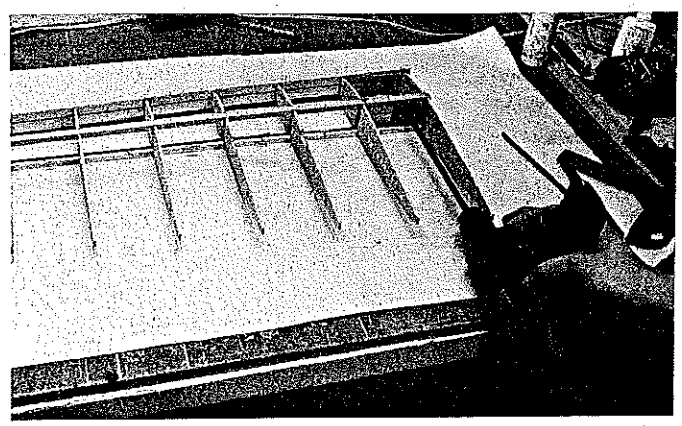
Place the partially finished wing in the wing seat, then center and triangulate it. Measure, measure, measure. If you have an incidence meter, use it! If not, measure, measure, and measure some more. Get this *straight!* When the alignment is perfect, and no sooner, secure the wing with rubberbands, glue tacks, or tape.

Using a ¼-in. drill bit, mark the dowel locations on F3 by pushing the bit from the ply doublers at the spars, through the leading edge, and into F3. Rotate the bit with your fingers until you're sure you've made a significant mark on F3. Remove the bit, then position and glue the plywood trailing edge doubler. Using a $\frac{5}{32}$ drill bit, drill through the doubler and wing, then through the wing mount blocks.

Remove the wing, then install the wing mount dowels and the bottom center sheeting. Drill through F3 with a ¼-in. bit, and enlarge the holes through the wing and trailing edge doubler to ¼ in. Thread the wing mount blocks with a ¼-20 tap, coat the threads in the block with CyA, and tap again. Set the fuselage aside, and complete the wing.

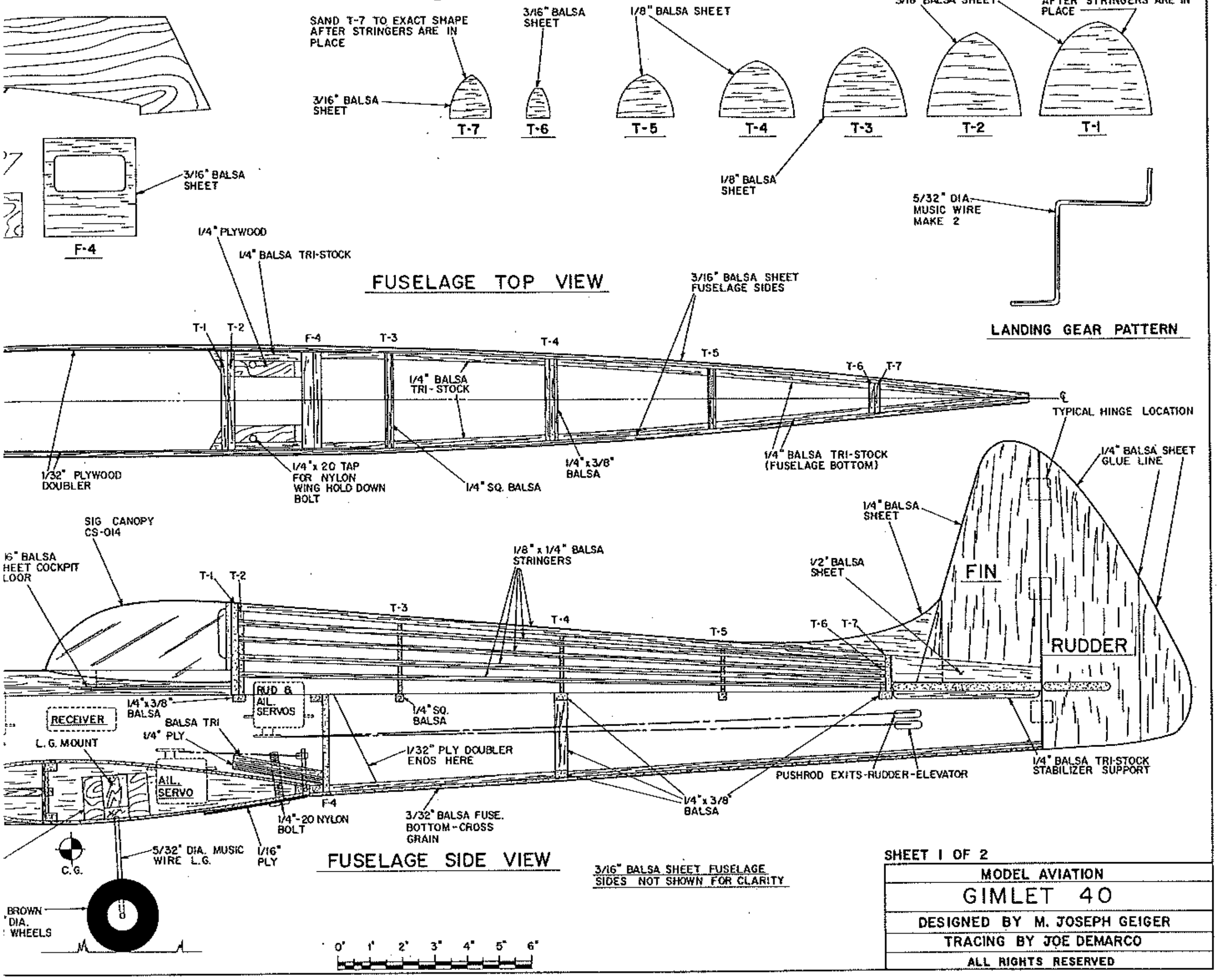
Reinforce the bottom center joint with 6-in.-wide fiberglass tape and thin CyA in the same manner as you previously did the top





Left: Install the bottom spar, again checking alignment with a straightedge. Match the centerline on the leading edge with the rib center marks, then tack glue the leading edge in place. Right: Glue a shear web between R-1 and R-2, then attach plywood doublers and the rear of the leading edge. Drill ¼-in. holes for the wing mount dowel. You'll note that the author is using a long drill bit. That's real handy for this purpose.

Full-Size Plans Available . . . See Page 202



joint. Add cap strips, wing tips, and braces. Install the aileron torque rods with epoxy, then secure the ailerons to the wing with Granite State iron-on hinges. These hinges result in an efficient, gapless joint, and are well worth the extra effort in covering an already hinged surface.

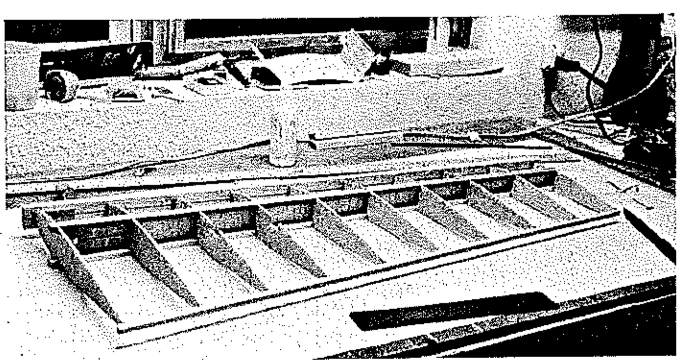
Final sand and balance the wing by removing material in the heavy tip as shown on the plan. The small fuselage fairing will be added to the bottom of the wing when the fuselage is complete.

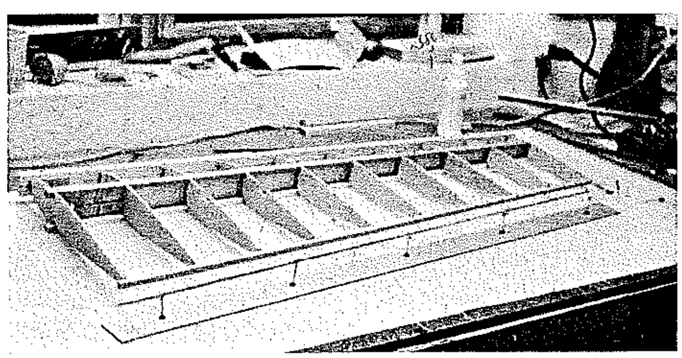
Glue the ½-in. tank compartment floor in place, then add the ¾-in. triangular stock at the joint between the floor and F1. Use ¼-in. triangular stock to reinforce all the other joints in the tank compartment. Cut to shape the fuselage top block and tank compartment hatch, make the cockpit cutout, and outline the undersides of the blocks with ¼ x ⅜-in. strips. Add the cockpit floor at this time.

Tack glue the hatch in position, using small drops of CyA. Be careful to use only small tack spots, as you will want to cut through them later. Glue the top block securely in place.

Use a plane and sanding block to rough out the basic shapes of the chin block, top block, and hatch. Tack glue a ⅛-in. spacer ring to the backplate of your spinner, then tack glue the nose ring to the spacer. Cover your engine ports to keep out sawdust, mount the spinner, and mount the engine on F1.

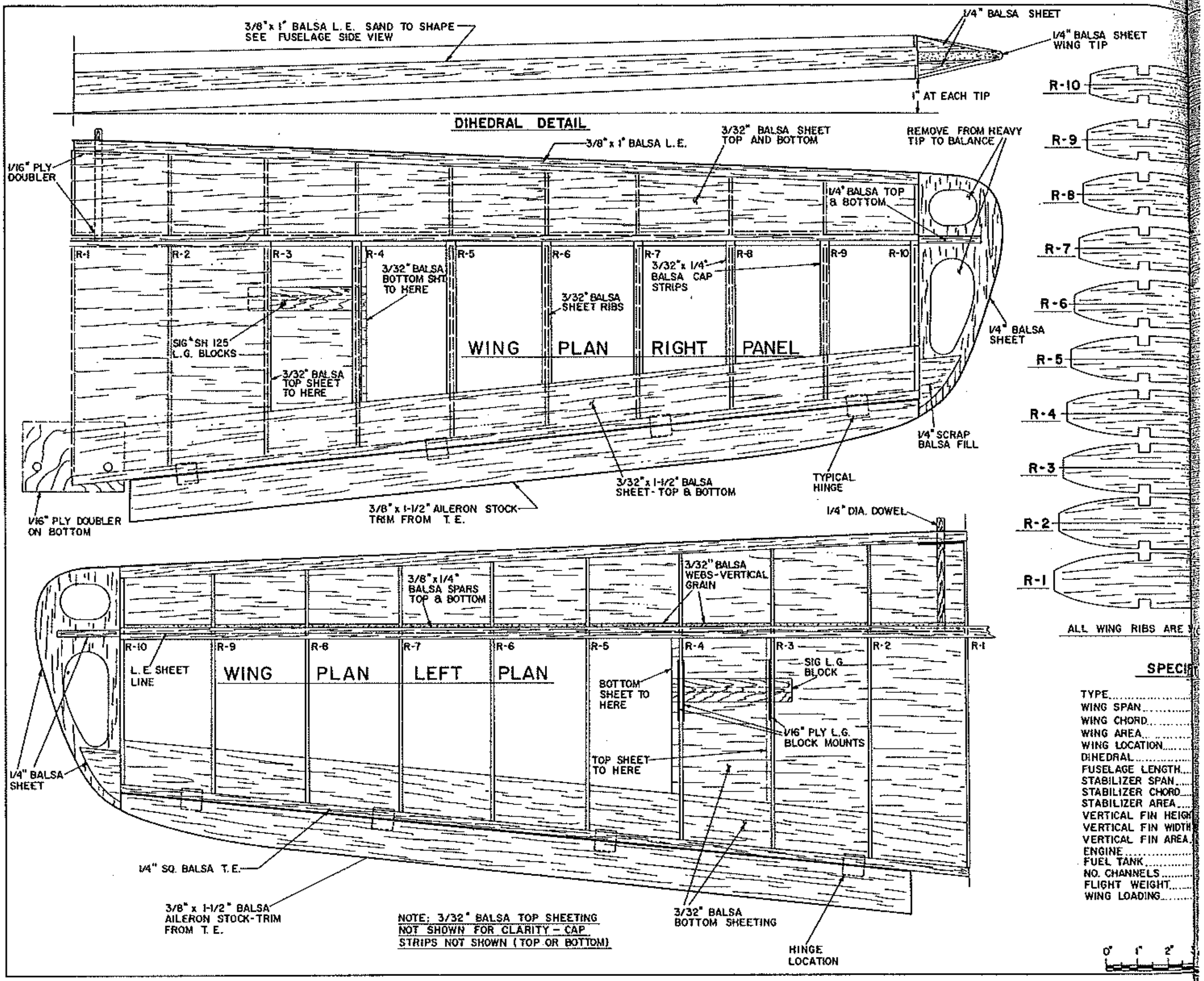
Wrap the spinner with masking tape to





Left: Center the ribs on the trailing edge, and tack glue with CyA. Install the remaining shear webs, then remove the pins, lift the structure, and reinforce all joints with medium viscosity CyA. Right: Pin the top trailing edge sheeting to the plans preparatory to gluing to the ribs.

Full-Size Plans Available . . . See Page 202

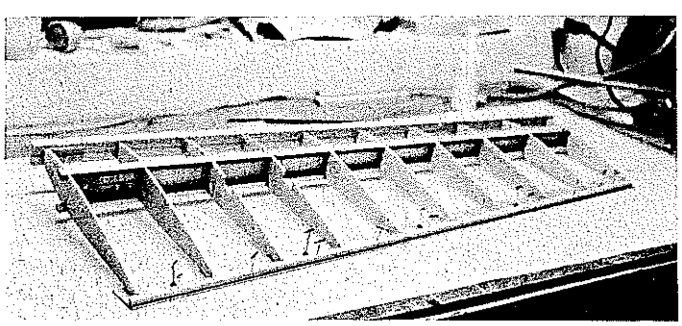


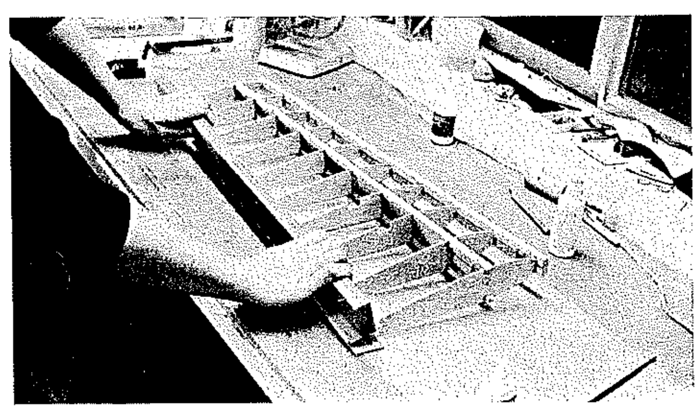
prevent it from becoming scratched while you shape the cowl blocks. Glue the blocks between F1 and the spinner ring, add triangular stock at the joints between the sides and bottom, then plane and sand the cowl so that it blends with the spinner and fuselage. Glue the bottom rear sheeting in place with the grain running side-to-side, then add triangular stock at the junction of the sides and bottom.

It's advisable to add the pushrod system before the turtledeck is in place. One 48-in. Goldenrod can be cut in half to make both pushrods. Run $\frac{1}{16}$ music wire inside the inner pushrod from the servos directly to the control horns to eliminate changes in trim due to temperature variations.

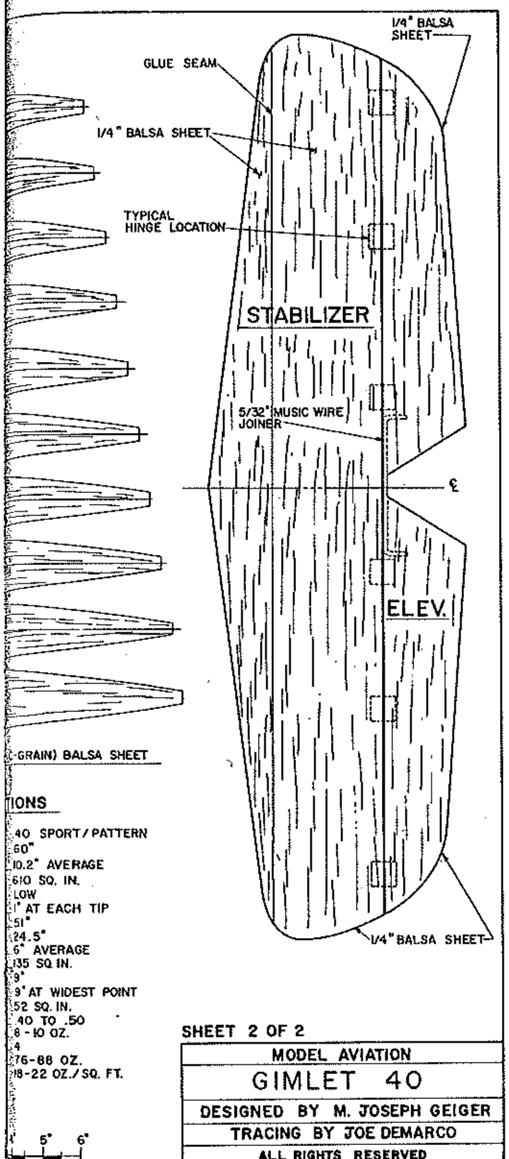
Laminate T1 to T2, then T6 to T7. Glue all the turtledeck formers in place. Add the stringers, taking care that they run as straight as possible from T2 to T6. Tack glue scrap pieces of ¼-in. balsa so as to duplicate the locations of the fin and stabilizer. Tack glue ½-in. scraps in place, and shape the fin filler blocks, T1, and T7. When you are pleased with the shape, break away the fin filler blocks for use after the stabilizer and fin are installed.

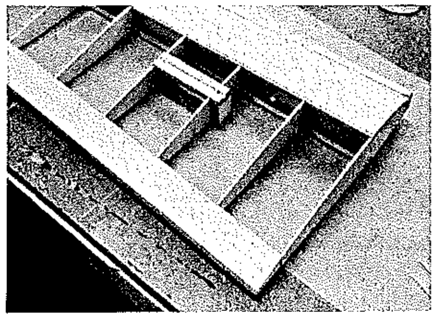
Empennage. Bend the elevator joiner wire from $\frac{5}{32}$ music wire. File a few notches into the portions that will penetrate the elevators so that the epoxy will have something to grab. Bevel the leading edges of the elevators, but leave the trailing edge of the stabilizer square. Join the elevator halves with the rod and epoxy, making sure their leading edges are lined up with a straightedge and that they are tightly pinned to your flat



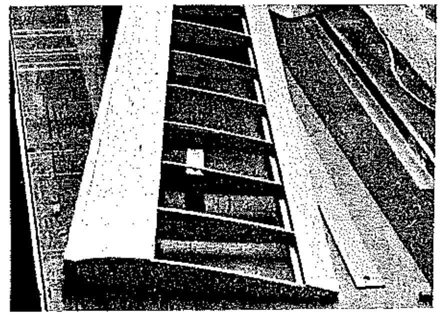


Above: Pin the structure to the top trailing edge sheeting and tack glue. Right: Pins removed, glue on the bottom TE sheeting with a *straight* 1 x 2 to hold the assembly flat while the slow-cure CyA sets.





Assemble the hardwood landing gear blocks and glue them into the wing at R-3 and R-4.



Reinforce the wing ribs with plywood doublers where they join the landing gear blocks.

building board.

When the epoxy has thoroughly set, hinge the elevator to the stab the same way you hinged the ailerons. Bevel the leading edge of the rudder, and cut a notch to clear the elevator joiner; then hinge the rudder to the square trailing edge of the fin.

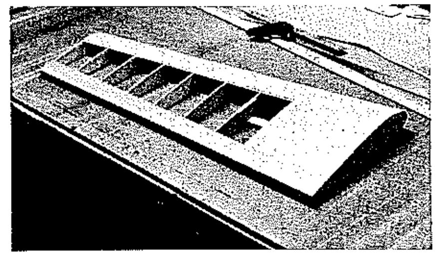
Using extreme care to establish alignment, position the stabilizer onto the fuselage. Measure the distances between the hinge lines of the elevators and those of the ailerons. Make sure the stab and wing are aligned when viewed from the front and rear. Check and recheck, gluing the stab in place only when you're satisfied that it lines up perfectly. Add triangular stock under the stab where it meets the fuselage.

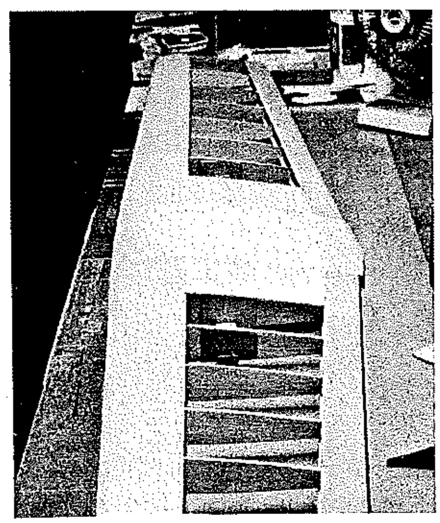
Still exercising great care, mount the fin and rudder using a small triangle, then position and glue the filler blocks in place. Install the dorsal fin, and round off the edges of the tail surfaces.

Final steps. Mount the wing. Build the wing fairing, using scrap wood, so that the fuselage flows into the bottom of the wing. Make sure you leave sufficient clearance for the wing to swing away from the fuselage for removal. Remove the tank hatch, and glue the rear lip of plywood scrap to its bottom. After drilling holes for the hold-down screws, fuel-proof the tank compartment and the engine compartment with Hobbypoxy 2.

Fill all the dings you've acquired during construction with a lightweight filler, then final sand everything in preparation for covering. If you haven't tried Ultracote yet, now's a good time. Though not as shiny as MonoKote, still my favorite for a really glossy finish, it's quite nice to work with.

Whatever covering material you choose, make sure to use bright colors—and to differentiate the appearance of the top and bottom. You're going to put this plane through some pretty wild gyrations and will need these visual assists. If you simply must use a painted finish, please keep it light. Install

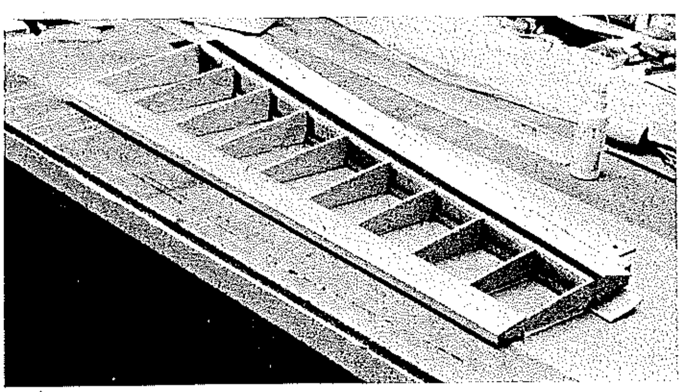


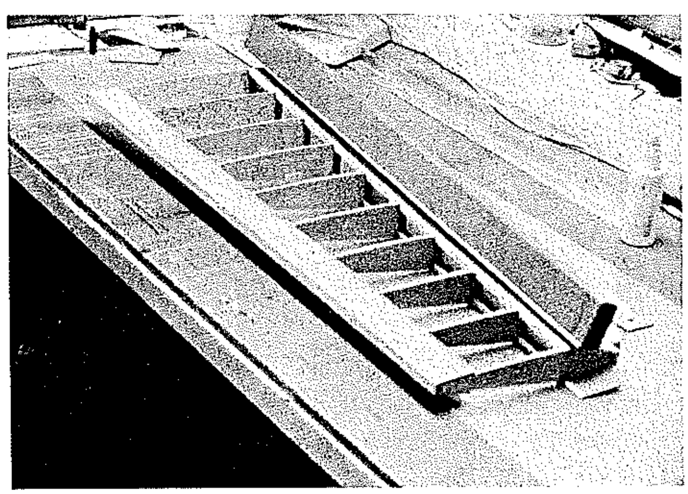


Above: Sheet the top center section (but leave off the bottom sheeting until the panels have been joined). Shape the leading edge. Below: Join the panels with 1 in. dihedral at each tip rib. Reinforce the top center section with fiberglass cloth and thin CyA.

the canopy with RC-56.

If you'll be using a lightweight engine like the Fox .40BB, placing a battery pack





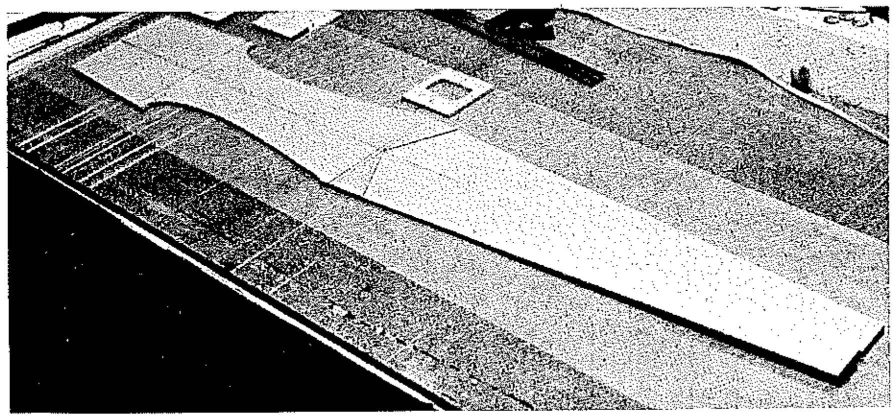
Above: Cut the leading edge sheeting to fit, then run a bead of medium-set CyA along the ribs to the spar and to the front edge of the sheeting. Right: Place the sheeting against the leading edge and allow the CyA to grab while you run a bead to the spar top. Roll the sheeting down onto the spar; hold it in place with a straight 1 x 2.

under the tank for proper balance is probably a good idea. Wrap the pack with foam rubber, then cover it with a plastic bag to protect it from possible fuel leaks. For a heavier engine, it's probably best to place the battery pack in the radio compartment above the wing.

Although there's plenty of room for all the radio gear in this compartment, if large standard type or high-torque servos are used it's advisable to mount the elevator and rudder servos so that they extend slightly into the turtledeck. Since the throttle servo doesn't require much muscle, an older or smaller one can be used; save your best servos for the elevator and ailerons. Lite Flite wheels help keep the weight down, and the newer ones are quite durable.

By adjusting the battery position, you'll probably come very close to the specified center-of-gravity (CG). Do *not* tolerate anything to the rear of the CG indicated on the plan, although a slightly forward (no farther than the spar) location is acceptable until you grow accustomed to the plane. Set the control throws at ¼ in. each way on the ailerons, ½ in. each way for the elevator, and the maximum you can get on the rudder without causing binding against the elevators. The nose wheel, on the other hand, need only move slightly each way.

Everything is hooked up, checked, and rechecked. You've bench run your engine until it's broken in, and you're thoroughly familiar with its operation. The great moment has arrived (gulp!). You're ready to go flying.



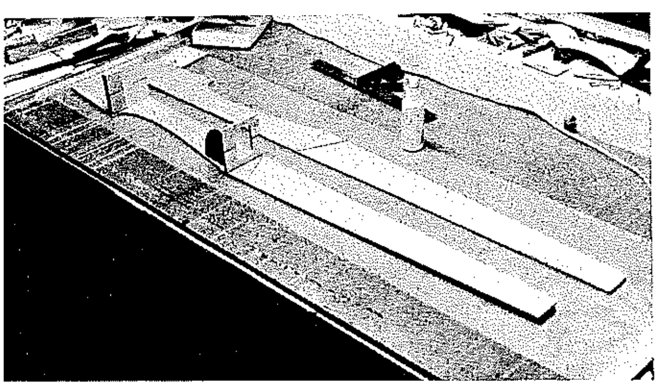
Lay out the fuselage sides on your building board with the doubler sides up and the tops butted against each other. Mark former and brace locations on both sides in one operation.

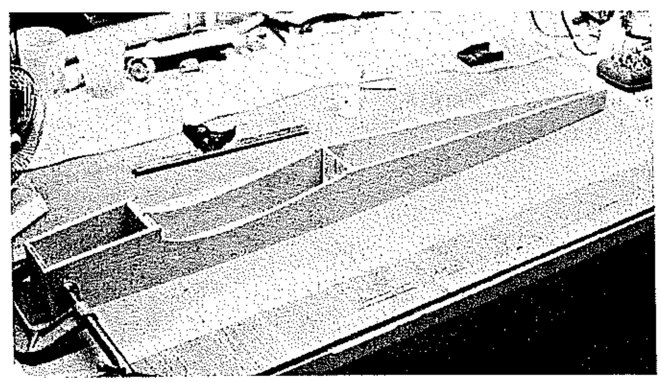
Flying. The Gimlet is a literal-minded airplane—it goes exactly where you point it and doesn't correct your errors. If you've done your teething with self-correcting trainers, therefore, you'll need help in learning exactly *how* to point this model. On the other hand, if you've learned to fly a low-wing plane with a symmetrical airfoil, you'll be surprised by how comfortable and confidence-inspiring the Gimlet is—and will soon be doing better aerobatics than you thought possible.

The Fox .40BB was already well run in, on the day of the prototype's debut, and started with its usual ease. After taxi tests showed the nose wheel to be properly adjusted, the ship was pointed into the wind and was brought up to half throttle. She tracked perfectly down the runway and accelerated rapidly, but when a touch of *up* elevator was added, we realized *(oh, horrors!)* that the ailerons weren't centered. A quarter roll at three feet and half throttle is hardly the ideal way to start an airplane's life—but the very good throttle response on the Fox warded off calamity. That spunky engine literally grabbed on, dug in its heels, and hauled the new plane up and out of trouble. Thanks, Duke! The moral of this tale is that you should check everything, and then have someone *else* check everything, too.

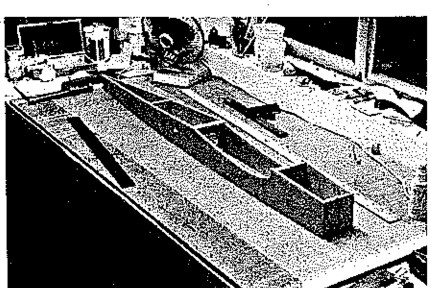
Flying the Gimlet is like meeting a new friend with whom you have instant rapport, someone you feel you've known forever. I've never before flown an aircraft that felt so familiar in such a short time. This model has presence. It doesn't just obey the commands, it actually seems to enjoy the flight itself. Upright, inverted, snapping, spinning, looping inside and outside effortlessly, rolling axially, climbing vertically until you say "enough"—and then landing so smoothly and taxiing so competently that you could swear the airplane is smiling and bursting with pride. Now that, my fellow modelers, is *fun!*

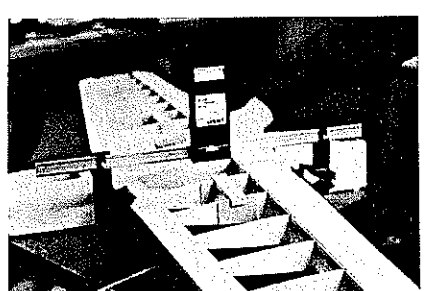
Thanks. Few designs are truly revolutionary; most, like this one, are evolutionary

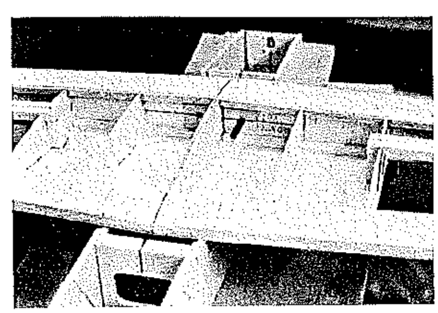




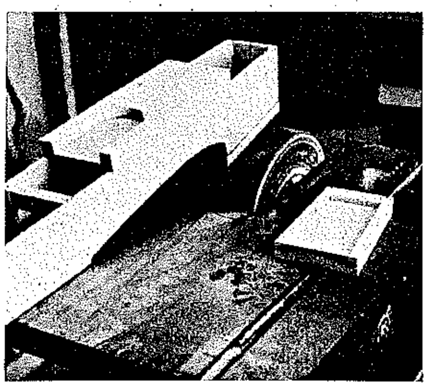
Left: Glue F-2/3 and F-4 to one of the sides. Use a triangle to make sure the formers are perfectly vertical. Right: Place the assembly over the top view, and glue on the other side. Pull the tail end together and add glue when the sides are symmetrical. Then glue in F-1 at the front.



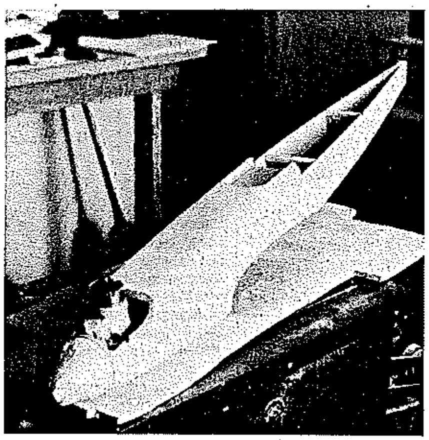




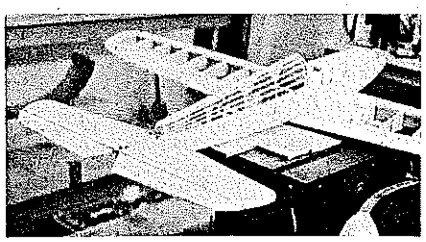
Left: Glue in the rest of the crosspieces. Position and glue the wing mounting blocks. Reinforce with small pieces of triangular stock. Center: Place the partially completed wing in the fuselage seat and check for squareness in all planes. Measure, measure, measure! If you have an incidence meter, use it. Right: With a ¼-in. drill bit, mark dowel locations on F-3. Rotate the bit with your fingers to make a significant mark.



Cut the fuselage top block and tank compartment hatch to shape. Make the cockpit cutout and outline the block undersides with 1/4 x 3/8-in. strips. Also add the cockpit floor.



Glue blocks between F-1 and the spinner ring. Add triangular stock at the joints between the sides and bottom. Plane and sand the cowl to blend in the fuselage and spinner.



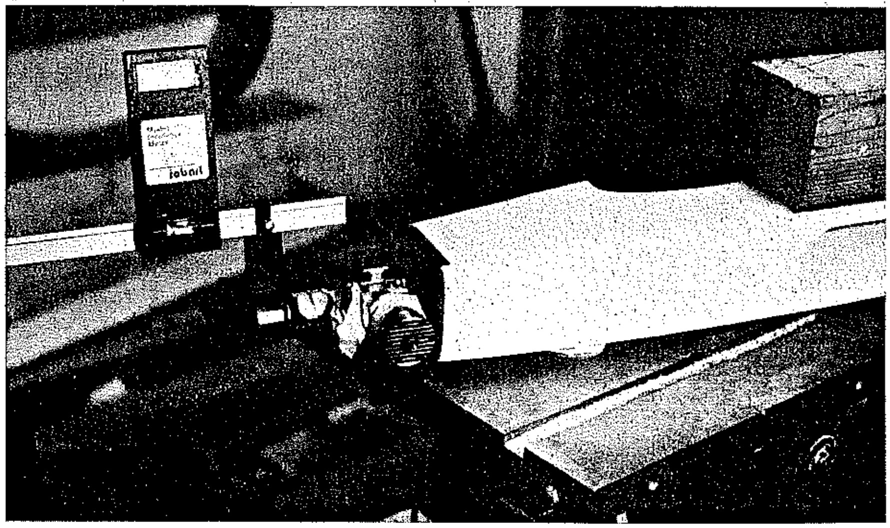
Align the stabilizer with the wing wing in all directions. Check and recheck. Glue in place when you are sure it is positioned perfectly.

and incorporate successful ideas from earlier variants. The designers whose ideas most strongly influenced my development of the Gimlet are Bill Werwage (of Control Line fame), Joe Bridi, and Don Anderson. Thanks.

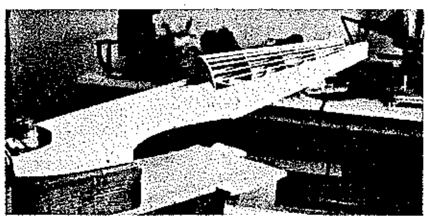
For the curious: A Gimlet is a small, screw-pointed tool for boring holes.

Gimlet .40 Specifications

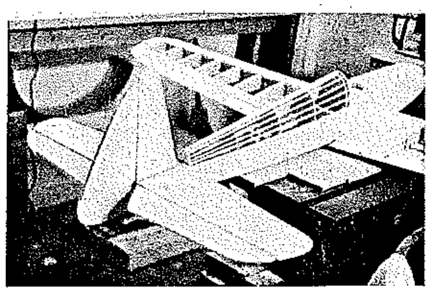
Type: .40 Sport/Pattern/Practice
Span: 60 in.
Wing chord (average): 10.2 in.
Total wing area: 610 sq. in.
Wing location: Low wing
Airfoil: Symmetrical
Wing planform: Double taper
Dihedral (each tip): 1 in.



An incidence meter is good for checking the thrust setting of your engine as well as wing incidence. The Gimlet likes three degrees of downthrust and one to three degrees of right thrust.

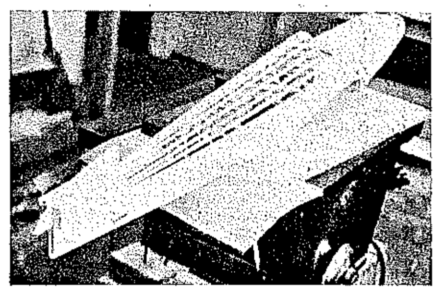


Before the turtledeck is in place, it is best to put in your pushrod system. Glue in all the turtledeck formers and add the stringers, taking care to run them as straight as possible.

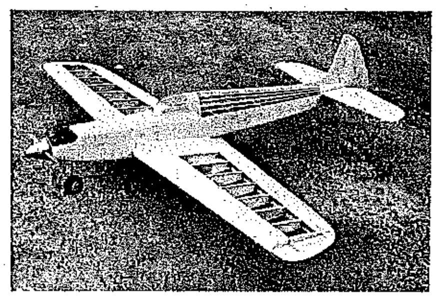


Add triangular stock under the stab where it meets the fuselage. Use a triangle to help mount the fin/rudder with perfect squareness. Position and glue in the filler blocks.

Overall fuselage length: 51 in.
Radio compartment size: (L)11 x (W)3 x (H)2.5 in.
Stabilizer span: 24.5 in.
Stabilizer chord (average): 6 in.
Stabilizer area: 135 sq. in.
Stabilizer location: Top of fuselage
Vertical fin height: 9 in.
Vertical fin width: 9 in. at widest point
Vertical fin area: 52 sq. in. (approx.)
Recommended engine size: .40-.50 two-cycle
Fuel tank size: 8-10 oz.
Landing gear: Tricycle
Recommended number of channels: 4
Control functions: Rudder, elevator, throttle, aileron
Weight ready to fly: 76-88 oz. (4.75-5.5 lb.)
Wing loading: 18-22 oz. per sq. ft.
Basic materials used in construction:
Fuselage: Balsa, ply
Wing: Balsa



Tack glue scrap pieces of 1/4-in balsa to occupy the spaces where the fin and stabilizer will be, then tack glue 1/2-in. scraps in place. Carve and sand the fin filler blocks to shape.



Fill in all the dings you've acquired during construction with a lightweight filler. Final sand everything in preparation for covering. Your Gimlet in bare bones form should look about like the author's model at this point.

Empennage: Balsa

Bill of Materials

Note: The balsa and plywood sizes indicated are commonly available units. Since they are the next largest sizes to those required in the project, there will be pieces left over for your scrapbox. If you've already accumulated a collection of scrap, check this first before buying or ordering. This is especially true for the plywood parts, as often only small amounts of ply are required. All plywood parts must be aircraft-quality birch, not poplar (Lite Ply).

Balsa sheet
(12) 3/32 x 3 x 36 in.

Continued on page 156

Gimlet/Geiger

Continued from page 33

(2) 3/16 x 4 x 48 in.
(1) 1/2 x 4 x 36 in.
(1) 1/8 x 2 x 24 in.
(1) 1/4 x 6 x 36 in., or (2) 1/4 x 3 x 36 in.
(1) 1/4 x 3 x 18 in.

Balsa strips

(5) 1/4 x 3/8 x 36 in.
(3) 1/4 x 1/4 x 36 in.
(4) 3/32 x 1/4 x 36 in.
(2) 3/8 x 1 x 30 in.
(8) 1/4 x 1/8 x 24 in.
(3) 1/4 x 1/4 x 36-in. triangular stock
(1) 3/4 x 3/4 x 3-in. triangular stock

Other

(1) 1/32 x 12 x 24-in. aircraft plywood
(1) 1/16 x 6 x 12-in. aircraft plywood
(1) 1/8 x 3 x 12-in. aircraft plywood
(1) 1/4 x 6 x 12-in. aircraft plywood
(2) 3/8 x 1 1/2 x 36-in. balsa aileron stock
(1) Set Sig SH125 landing gear mounts
(1) Sig CS014 canopy
(1) 1/4-in. hardwood dowel (8 in. long)
(1) 6 x 24-in. medium fiberglass tape
(1) Set Du-Bro aileron torque rods
(2) 1/4 x 20 x 1 1/2-in. nylon bolts
(1) Set Rocket City aileron links
(4) 6-32 x 3/4-in. bolts
(4) 6-32 T nuts
(4) 4-40 engine mount bolts
(1) 5/32-in. music wire
(1) Goldberg adjustable nose gear
(1) Goldberg steering arm
(2) Packages Granite State iron-on gapless hinges
(1) Engine mount
(4) Wheel collars (5/32 in.)
(2) Large control horns
(1) 48-in. Blue Sullivan Gold-n-rod
(1) Sullivan cable pushrod
(2) 1/16 x 36-in. music wire inner pushrods

Expo/Weinreich

Continued from page 39

1/4-scale V-8 engine design.

Technopower II, maker of radial engines, showed three new ones at the Expo, a five-cylinder of 2.26 cu. in. displacement, a seven at 3.16, and a nine at 4.0. The radials, all of which have a diameter of 9 in., range in price from $1,395.00 to $1,995.00. The company's address is 610 North St., Chagrin Falls, OH 44022.

Last but not least, the AMA itself did a brisk business at its large booth. The staff told people about the organization and took membership renewals and signed up new members, about 200 in all.

The Expo ended on a happy note. As the doors closed and the people went out of the fairgrounds late Sunday afternoon, they found that the cold snap had broken. The temperature was above freezing, and the ice on the roads was beginning to melt.

Sunspots/Stuecker

Continued from page 44

layer induced by the present upswing in sunspot activity is already altering radio transmissions. The ARRL bulletin tells us that it's now possible for amateur operators in the U.S. to talk to others in Africa and Europe on the six-meter (50 to 54 MHz) amateur band—the same six-meter amateur band that some of us use to control our model aircraft. Until this peak in sunspot activity began, the six-meter band capacity had been limited to short-range communications (20 to 30 miles, typically) making it ideal for RC use. If it's currently possible for amateurs to talk to other amateurs in Africa and Europe on the six-meter amateur band, it's also entirely possible for the African and European stations to be heard in this country. Imagine being "shot down" by some person operating a transmitter in England (or, more likely, by someone in a nearby state). Further, as propagation conditions continue to "improve," interference may be observed on higher frequencies as well; don't think you're immune to long-distance interference because you operate on 72 MHz (the four-meter band).

What can be done to minimize the poten-