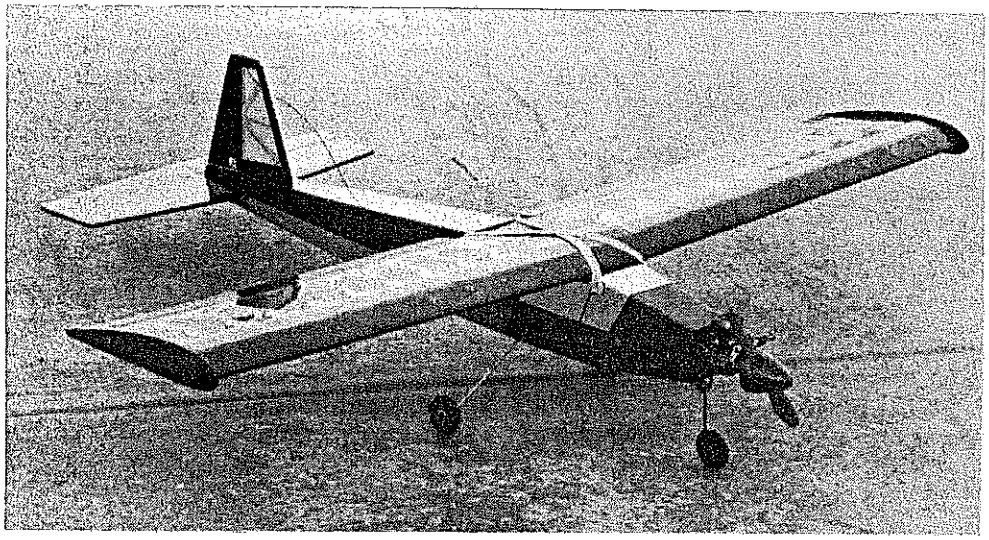
#240

MISFLIT

For four channels and a 15 engine, this responsive sport machine is fully aerobatic—at a cost that won't blow away your "allowance." ■ L. F. Randolph

ONE OF MY flying buddies claims that all of my airplanes flit rather than fly. This is not true, for I have been known to fly large fuel-guzzling 40's on occasions, but I do like small, quick airplanes. Misflit is one of these. This same flying buddy also thinks I should build only stand-off scale models with lots of guns and bombs that make lots of smoke and noise, as he does, but to me an airplane that does not look like a model airplane is of no interest. Misflit looks like a model airplane.



Ready for flight, the 15-powered Misflit conveys a feeling of competent design, reenforced by a study of Neil Liptak's sharply drawn plan. Tip plates and simulated cabin enhance its looks.

Misflit is a quick but forgiving airplane. The addition of wing tip plates (something that goes back to my free-flight days before WW II) and built in wash-in in both tips make it an airplane that must be made to snap, and the ailerons remain active well into the stall. To sum up, Misflit is a groovy, rolling, spinning, snapping, looping knife-edging fun-fly winner that will go where you point it, do what you ask of it and, if you ask too much, forgive you. Misflit is a cheap date, too, for one gallon of low-nitro fuel will fly her for 10 hours and 40 minutes at full bore, and half throttle will produce well over 15 hours of fun for the same price. She is quick and inexpensive to build and big enough to be seen at a reasonable distance, yet small enough to go to the flying field in one piece.

The Kit: Make a template of the wing rib from an old file folder or other thin stiff paper, and use a ball-point pen to make a

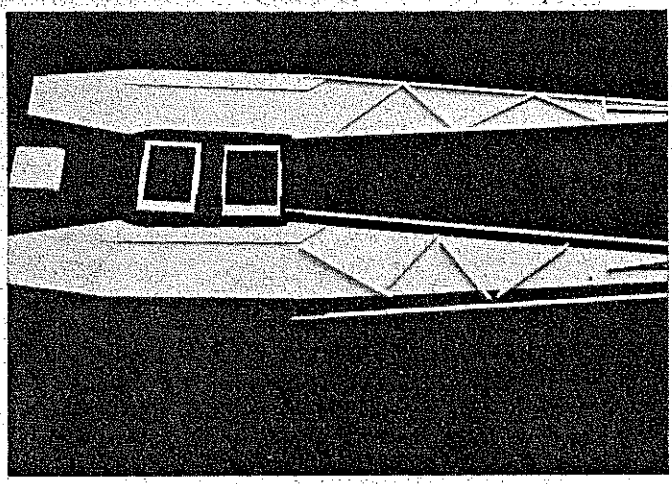
"printed sheet" on two pieces of medium hard 1/16 × 3 × 36 balsa. Move the template around to find the most ribs that can be cut from each sheet. You need 24. After the ribs have been cut out and gang sanded to the same shape and size as the template, take four of them from the center of the stack and cut 1/16 from the top and bottom of each; these are the center ribs that will receive sheeting, mark them R2.

The trailing edge sheeting is cut from one piece of 1/16 × 3 × 36 hard balsa. Because there are four of them, and they are an inch wide, the fourth one must be made by splicing. When the three have been stripped, cut them to a length of 22-1/16. The remaining one-inch-wide strips are spliced to form the fourth. The wing spars are stripped from a sheet of 3/16 × 3 × 36 medium hard balsa. Cut eight strips 3/16 sq. and four strips 3/16 by 3/8, the extra 3/16 sq. are for the stabilizer and rudder. The spar webbing is 1-15/16 by 1 by 1/16; 16 are vertical grain balsa, and four are plywood.

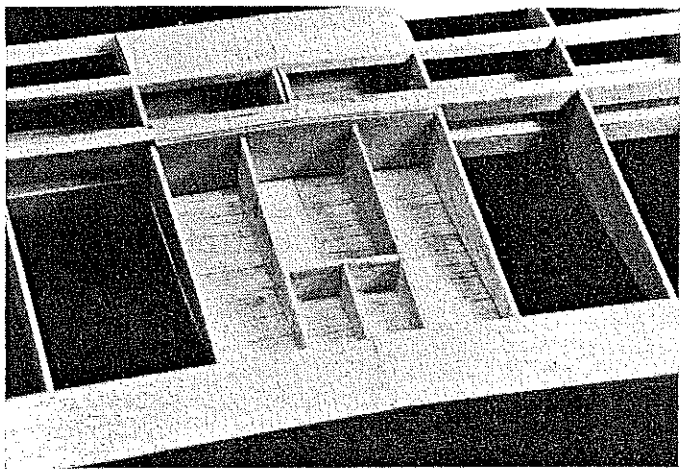
The dihedral braces are cut from ⅛ plywood, as is the landing gear mount. The stabilizer spar doublers are 3/16 strips cut from the 1/32 plywood used for the wing tip plates. Cut the fuselage sides from two pieces of medium soft 3/32 × 4 × 36 balsa to the shape shown on the plan side view. All lines are straight, so use a straight edge. Pin the two sides together and gang sand them to the same outline. The 1/32 ply doublers are cut to fit the finished sides, one left and one right.

The cabin doublers are cut from 1/16 sheet balsa and the longerons and uprights are ⅛ sq. soft balsa. Cut the cabin formers from ⅛ plywood. The center cut-outs from

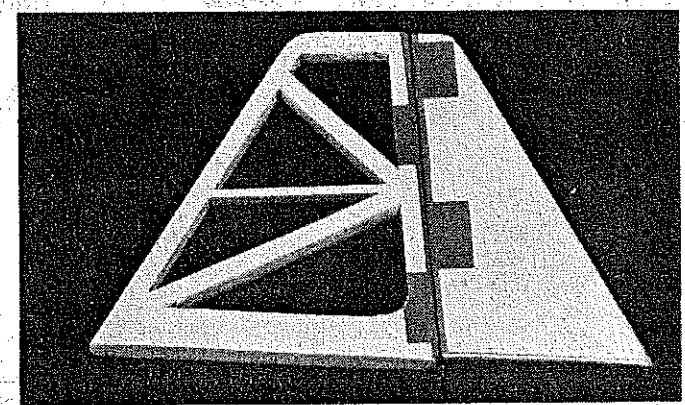
The designer flies the aircraft by the camera in typical pass. Randy likes his planes to "flit" so nervous stick tweakers should be happy with its responsiveness. Gallon of fuel gives 15 hours.



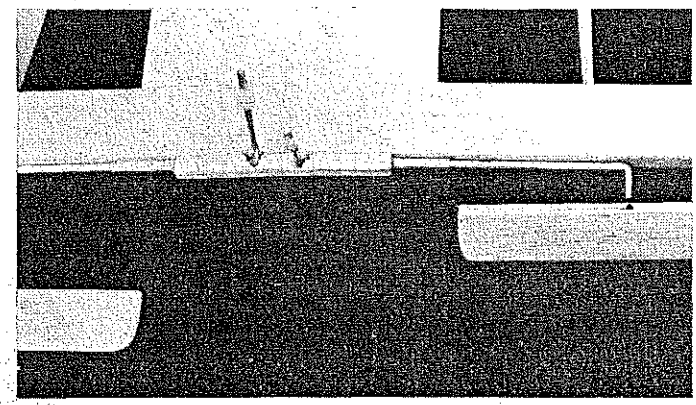
Assembled fuselage sides before joining together—note how the longerons are notched to fit over the doublers. It's textbook structure.



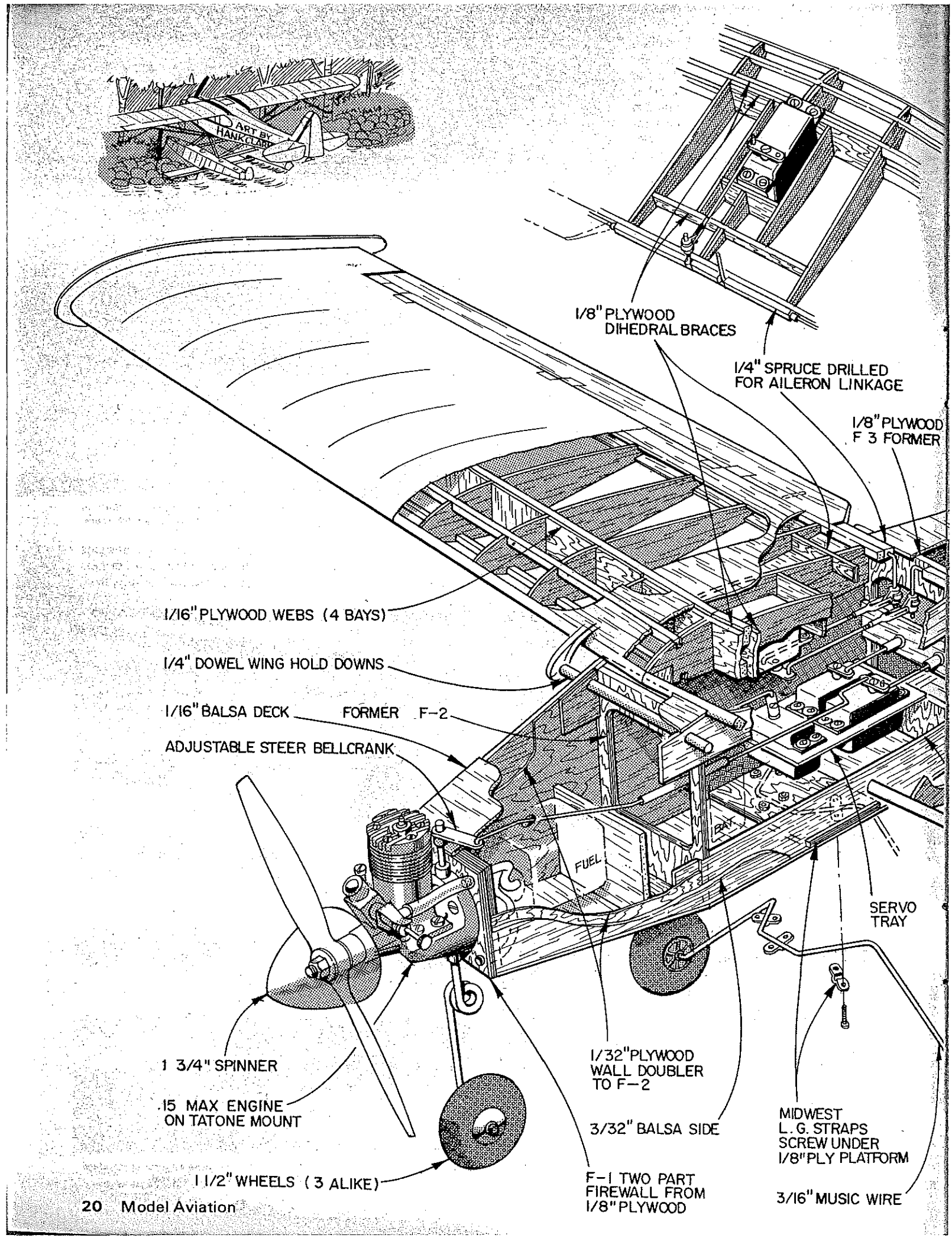
How the aileron servo well is formed after the wing panels have been joined together, and top center section sheeting completed.

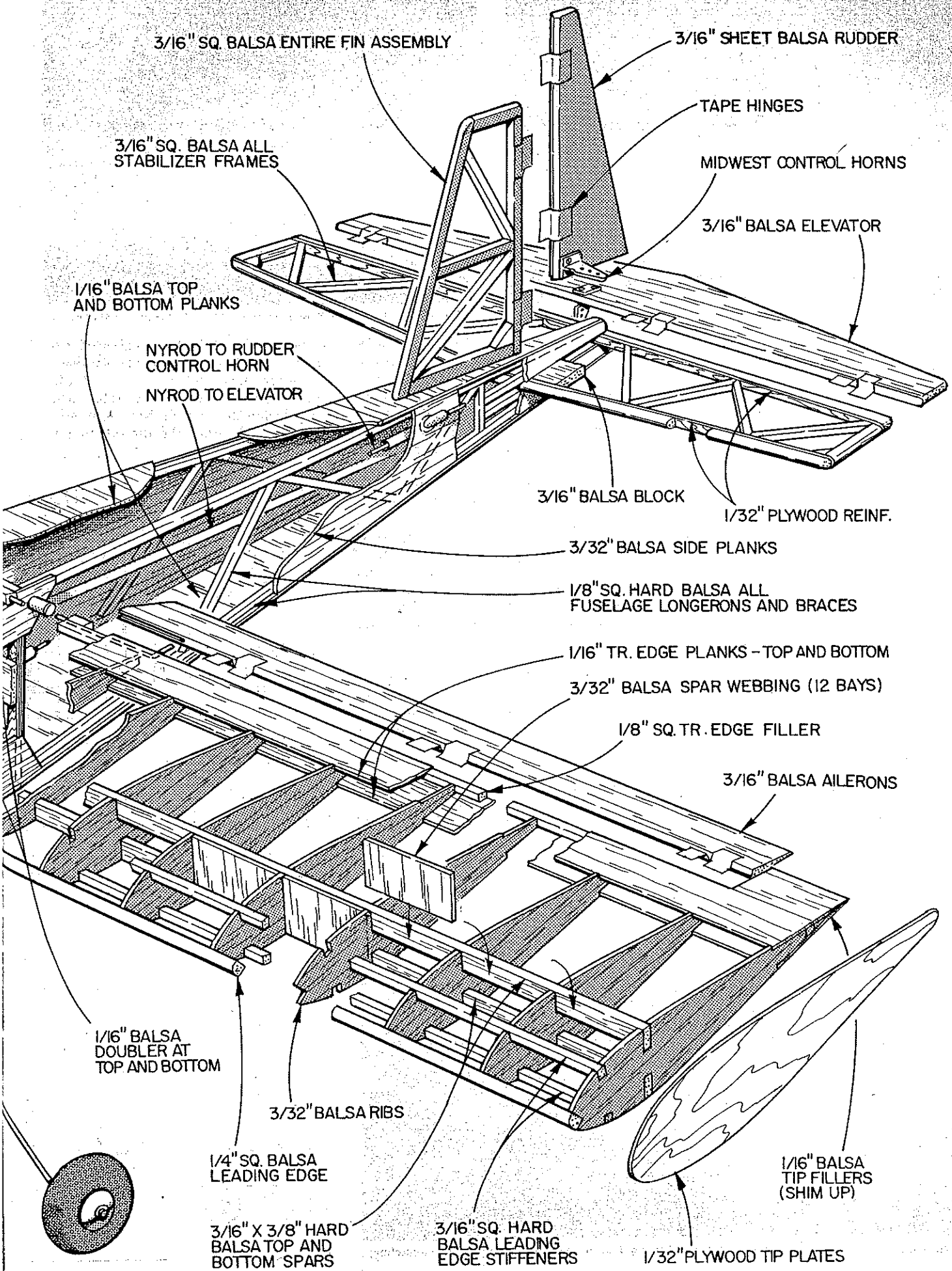


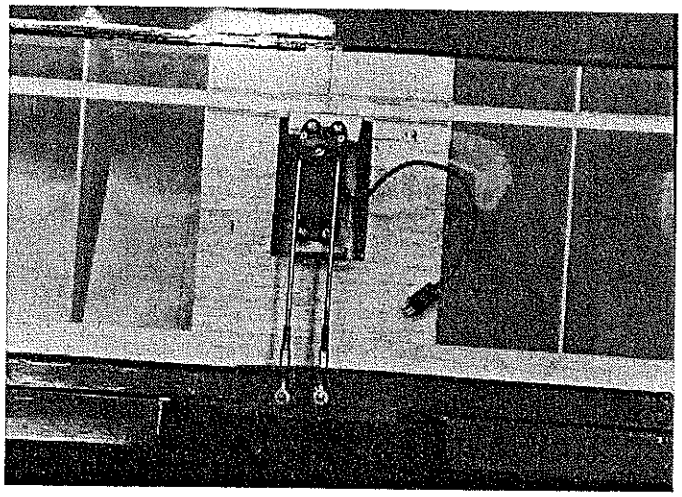
If messy slotting, pinning, and epoxy annoy you, this simple MonoKote hinged rudder takes little time, is neat. Hinges before covering.



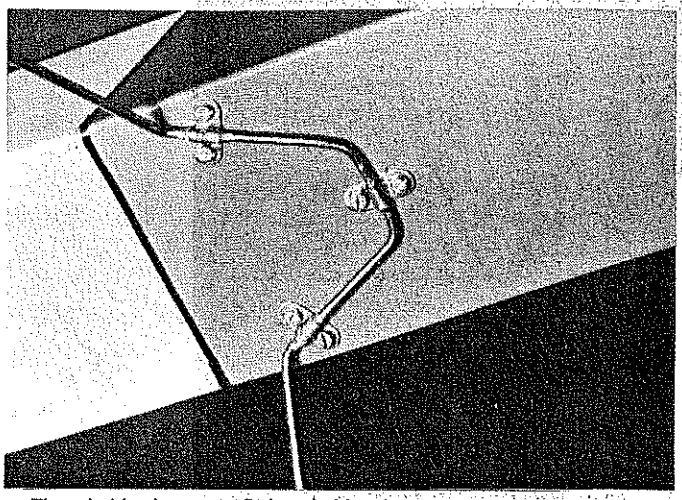
Aileron torque rods are installed in what has become an almost standard arrangement. Note how aileron is grooved to receive the rod.


ART BY HANK LAST
1/8" PLYWOOD DIHEDRAL BRACES
1/4" SPRUCE DRILLED FOR AILERON LINKAGE
1/8" PLYWOOD F 3 FORMER
1/16" PLYWOOD WEBS (4 BAYS)
1/4" DOWEL WING HOLD DOWNS
1/16" BALSA DECK
FORMER F-2
ADJUSTABLE STEER BELLCRANK
FUEL
BAT
SERVO TRAY
1 3/4" SPINNER
.15 MAX ENGINE ON TATONE MOUNT
1 1/2" WHEELS (3 ALIKE)
1/32" PLYWOOD WALL DOUBLER TO F-2
3/32" BALSA SIDE
F-1 TWO PART FIREWALL FROM 1/8" PLYWOOD
MIDWEST L.G. STRAPS SCREW UNDER 1/8" PLY PLATFORM
3/16" MUSIC WIRE


3/16" SQ. BALSA ENTIRE FIN ASSEMBLY
3/16" SHEET BALSA RUDDER
TAPE HINGES
3/16" SQ. BALSA ALL STABILIZER FRAMES
MIDWEST CONTROL HORNS
3/16" BALSA ELEVATOR
1/16" BALSA TOP AND BOTTOM PLANKS
NYROD TO RUDDER CONTROL HORN
NYROD TO ELEVATOR
3/16" BALSA BLOCK
1/32" PLYWOOD REINF.
3/32" BALSA SIDE PLANKS
1/8" SQ. HARD BALSA ALL FUSELAGE LONGERONS AND BRACES
1/16" TR. EDGE PLANKS - TOP AND BOTTOM
3/32" BALSA SPAR WEBBING (12 BAYS)
1/8" SQ. TR. EDGE FILLER
3/16" BALSA AILERONS
1/16" BALSA DOUBLER AT TOP AND BOTTOM
3/32" BALSA RIBS
1/4" SQ. BALSA LEADING EDGE
1/16" BALSA TIP FILLERS (SHIM UP)
3/16" X 3/8" HARD BALSA TOP AND BOTTOM SPARS
3/16" SQ. HARD BALSA LEADING EDGE STIFFENERS
1/32" PLYWOOD TIP PLATES



The servo in place, the aileron linkage hooked up—all ready to fly.



Three hobbyshop strap fittings hold main gear to the plywood floor.

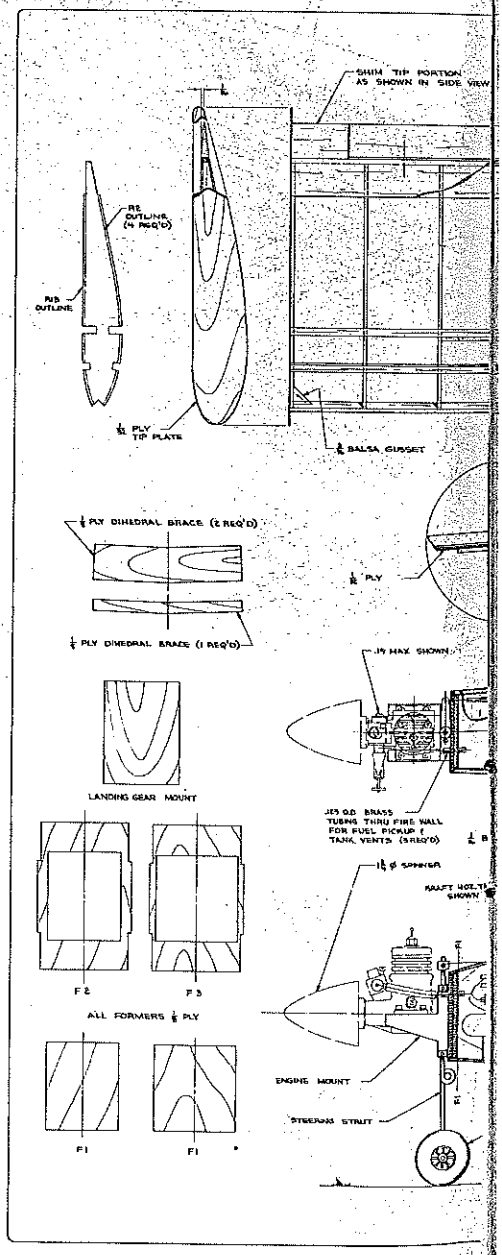
these formers can be used to make the firewall. Cut them to shape and glue them together with epoxy to form the ¼ firewall. Drill the firewall for engine mounts, fuel lines and throttle linkage. The addition of 1/16 sheet balsa for wing center section and fuselage top and bottom completes the kit.

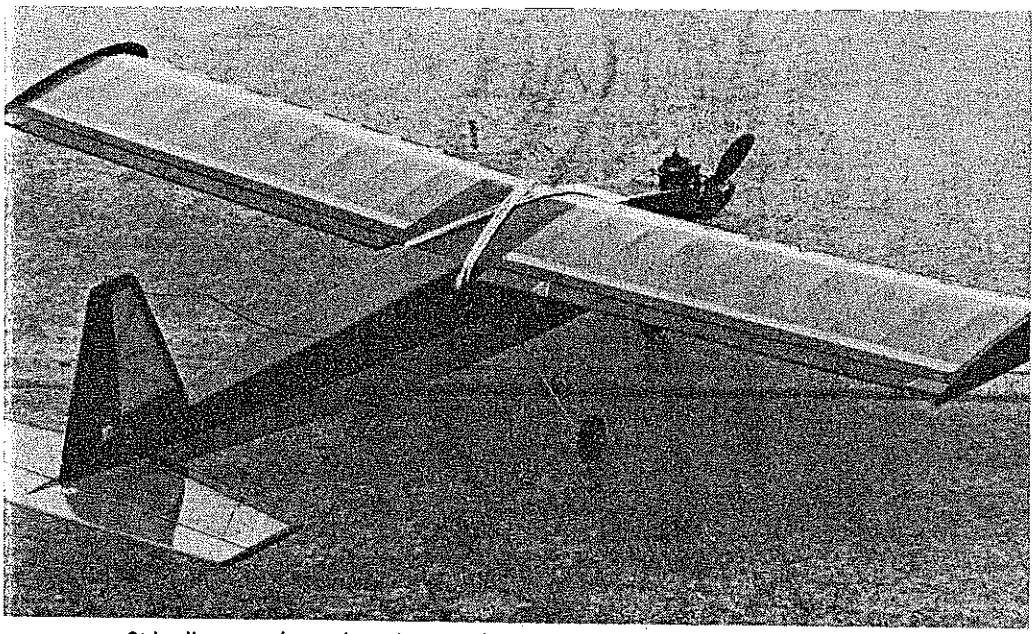
The Fuselage: Epoxy the 1/32″ plywood doublers to the forward part of the fuselage sides, making sure there are left and right sides with the plywood doublers to the inside. The cabin doublers are notched to fit over the ply doubler and glued in place. Longerons are notched to fit over the cabin doublers and glued, the uprights and stabilizer supports added last. When all is dry, again pin the two sides together and sand the edges true and square.

Place one side over the side view on the plans and mark the location of the cabin formers. While the side is still flat on the plan, glue the cabin formers in their locations, using a square or right triangle to keep them square with the fuselage side. Be certain that the formers are where they belong, front in front, etc. When the glue has set, glue the other side on top of the formers and, using a square, make sure that the edges of both sides are square with each other front and back top and bottom.

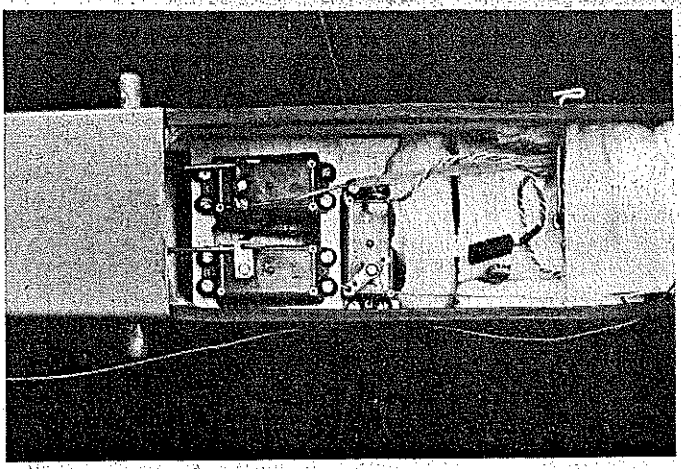
When all is dry, place the bottom of the fuselage on a flat work surface over the top view of the plan. Bring in the nose sides to the firewall and epoxy it in place, holding it with clamps, string, rubber bands, or whatever works for you. Bring the tail together, beveling to fit, then glueing, being sure the stabilizer cut-outs are parallel to the work surface. Locate the position of the landing gear mount and notch the bottom fuselage sides 1/16″ so that, when the sheeting is added, the landing gear mount won't stick up above it. Glue in the mount and sheet the bottom with 1/16 balsa, cross grain.

Cut the exit holes for the outer nyrod and install the rods using epoxy where they exit the fuselage side, and add bulkheads to the aft fuselage as shown to hold them in place. Epoxy the brass tube fuel and overflow lines through the firewall and the T-nuts for the engine mount to the back of it. Install the fuel tank, using foam on the bottom and sides to wedge the tank into position, and a 3/16 balsa bulkhead behind it. Attach the fuel and overflow lines. Use inner nyrod to bring the throttle through the firewall to the cabin and epoxy it into the firewall. Sheet the fuselage with 1/16 from the firewall to the

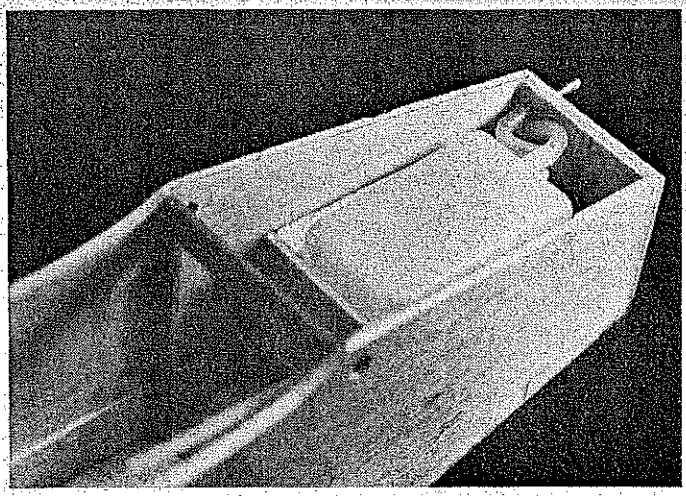




Strip ailerons and one-piece elevator minimize fussing. Red and yellow color scheme eye-catching.



Servo installation showing how nosewheel and throttle pushrods are brought in. Randy seems to have custom-tinkered those servo arms.



Kraft 4-ounce tank is wedged in place with foam—neat installation.

forward cabin former. Cut a hole in this sheeting for the inner nyrod nose gear steering shown. Use epoxy and microballoons to install the nyrod, making sure that it extends well into the cabin. Complete the top sheeting, install the cabin gussets, and the fuselage is ready for final sanding.

Wing: Cover the plans with the backing from MonoKote or the film from a cleaners bag to keep the structure from sticking to them, and pin the bottom trailing edge sheeting in place. Glue a piece of ⅛ sq. to the back edge of this sheeting. Using a rib as a gauge, pin the bottom main spar to the plans. At the center of both wing panels

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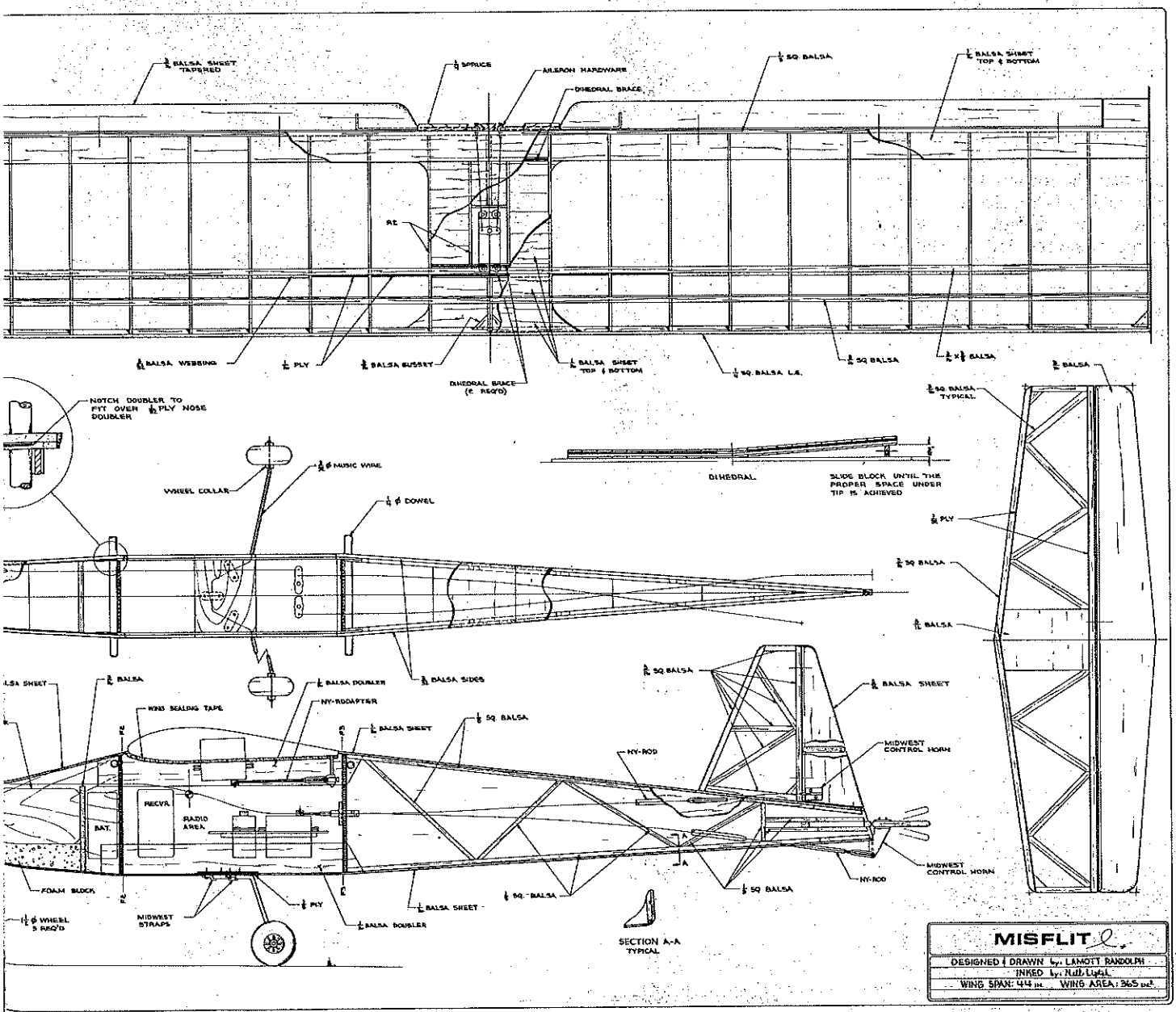

FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 120

ing edges. Little block fairings are added behind the leading edges' extensions from the apex of the wing.

By now you will have noticed that when the wing assembly is fitted to the fuselages, it becomes fairly rigid in the longitudinal direction, since the structure is supported at four points (the leading edges and the trailing edges of the lead plane and rear plane) and strengthened by the longitudinal dowel. The tail surfaces can now be attached to the four fuselages, the wire landing gear skid epoxied in place, the rear nylon skid installed (also install nylon skids on the bottom of the wingmen fuselages, right at the back end of the fuselage, to keep them from getting scarred up when landing on asphalt), and the assembly is complete except for installation of engine and radio control mechanisms.

Engine Installation: This is somewhat of a builder's choice situation. In my case, I had a firewall backplate available to use with the Max 10, but regular engine mounts can be adapted. Be sure they are short ones that keep the engine as close to the firewall as possible, both for appearance and for balance. I prefer the backplate mounting because it is simpler.

The engine servo is mounted on servo tape on the bottom. As a precaution against it pulling loose, I also put a couple of drops of Hot Stuff between the tape and the bottom sheeting.

After you have tailored the flexible engine control rod to fit the engine control arm and the servo, you can build up the fuselage fairing forward of the firewall so that it houses the engine, allows access to the mounting bolts and control clevis, and fairs smoothly into the 1½" spinner on the Cox 7-3½ prop.

Receiver and Control Rod: If I were going to build another formation of Blue Birds, (and I plan to do so) I would use a different radio installation. It would consist of a small receiver in the fuselage compartment, just aft of the tank and bulkhead #1 in the lead plane. From that receiver, I would run long leads to servos which are individually mounted in the wings, just ahead of the surface they are to move, and connected directly to them. That type of mounting would eliminate one of the problems which I have to solve each time I fly the Blue Birds, namely, what will be the temperature, since the flexrods expand and contract, and change the surface settings. It's not serious, but you do have to consider it each time you fly.

So, if you have the design ingenuity to do it that way, I'd recommend it. But also, check with the manufacturer of your radio, because you may have to put a choke in the long leads to the servos. Don't ask me why; I don't know, but I am told that it's a good idea if the leads are over 15 inches long.

However, if you go ahead with a setup like mine, then study the plans and photos carefully, and you can see how the flexrods are inserted into the fiberglass leading edges, then exit just outboard of the wingmen fuselages, and curve around to attach to the aileron horn. A little bracing piece of balsa between the top and bottom spars will hold the curve in place.

The fitting on the receiver for the ends of the aileron flexrods is made by carefully drilling a small hole in the side of a short length of inner nyrod, then inserting a wire with a 90° bend in it, which sticks out and can be inserted through the hole in the servo control. At the ends of the aileron nyrods, a length of wire that has a Z-bend in it is inserted into the inner nyrod, and the other end is inserted into the short piece which is now attached to the servo arm. The length of the vertical section of the Z-bend is tailored to fit the distance from the end of the aileron nyrod up to the top surface of the Supermini brick. A wheel collar is used to affix the Z-bend wire to the proper location inside of the short length of nyrod. The end of the Z-bend wire, which is inserted into the aileron nyrod, is permanently attached by applying a drop of Hot Stuff.

The wheel collar method of holding the aileron nyrod Z-bend attachment in place has two useful features. It makes it easy to assemble and disassemble, and also, when temperature changes occur, it provides an easy way to adjust the length.

The nyrod which goes back to the elevators has to be carefully routed through the fuselage and past the battery pack, then epoxied to the top of the connecting dowel back to bulkhead #2 in the rear fuselage. There, similarly to the aileron servo attachment, a wire bent 90° is inserted through a hole in the side of a short length of inner nyrod, and, where that short nyrod exits through the slots in the sides of the rear fuselage, short Quiklink wire rods, with clevises, are cut to length, bent 90° to have about a ½" length of wire rod which can be inserted inside the nyrod. The assembly is stiffened by epoxying a small piece of 1/16" plywood at the T-joint. The photos don't show that; I added it later when I discovered that I had slight elevator flutter at high speed.

Covering: Here again it's a matter of builder's choice. I used Super MonoKote to cover the entire surfaces, then, for trim over the basic Navy blue, I used gold Trimstrip. That also made it easy to use Navy blue Trimstrip to make the aileron and elevator hinges. Finally, to make the connecting areas of the fiberglass rods and dowels as inconspicuous as possible, I mixed some light blue enamel with some white enamel, until they became a very pale blue color, and painted the rods. Thus, at a distance, the connecting rods fade into the sky background and are almost invisible at more than 150 foot distance.

Flying: If you're anything like me, you'll be nervous on that first flight. I really was lucky. The rains in California had made a lot of fields grow some of the lovely "long, tall grass" that old-time modelers so dearly love, and I was able to test glide and get a good elevator setting. I found that, with the CG located as it shows on the plans, even though tailend Charlie is in a slightly nose-down attitude, I still had to have about 12° of up elevator as the neutral setting. And the total throw should be about 30° up and 30° down from that neutral. Ailerons should also have at least 30° of throw.

On the first flight, have an experienced associate hand launch the Blue Birds for you. Then you can be ready to instantly correct for any tendency to either dive or climb too steeply, should it occur. If it does, then your associate can come back to you, and while you fly the formation, he can make the trim adjustments for you. Under no circumstances should you try to do it! You will find that the Blue Birds fly very well, once trimmed out, but you will also find that, unless you keep your eyes on them at all times, you will quickly get disoriented by the four fins, and won't know which way the formation is banking. Only when they are virtually overhead does this disorientation tendency diminish. I know—I found out the hard way.

After a few flights you will know what changes, if any, are needed in the amount of surface travel. Also, at some time when your engine idle is very reliable, you should get extra altitude and throttle back to get

an idea of the glide angle, and also the response rate to elevator. This will be valuable to you in the event you have an unexpected engine flame-out. Dead-stick landings are not easy when your wing is full of holes, which is essentially the case with the formation plane.

One more thing. The four-ounce tank is well ahead of the CG, so the Blue Birds get a bit tailheavy if you fly the tank dry. No problem, but be ready for the trim change. I avoid it by usually only flying about two ounces worth.

You'll probably cuss me at times as you try to figure out some of the less obvious construction features, but go ahead. Persevere.

You'll be the hit of the show with your Blue Birds.

RC Technique/Myers

continued from page 17

engine. Discussed above.

4. *Plan your landing before you take off.* This is so obvious that you have to wonder why landings are the one maneuver that nearly everyone does poorly. You can see the jaw muscles tighten and the eyes go all squinty when an engine stops unexpectedly in flight. "Now, how do I get out of this?" seems to be the first thought in many heads. Sure, we all are aware that most airplane accidents happen in the vicinity of the runway, but that's no reason to panic. "A glider is easier to land than a powered plane" is another of my aphorisms. It gives the student confidence that he can land safely. "Concentrate on keeping the wings level." With that simple instruction foremost in his mind, most students make good landings *without even being aware of the fact that the plane has stopped moving.*

Spot landings are another matter, but like learning to shoot a gun, the first thing to do is get all your shots in one part of the target. Once that happens, it's quite easy to move the group over into the Bullseye.

That's enough for this month. Keep the letters coming!

George Myers, 70 Froehlich Farm Rd., Hicksville, NY 11801

CORRECTIONS

In the September issue, "Wing Sox" transportation bags by GBS Enterprises, were referred to as "Wind Sox." We regret the error.

In the October issue, page 60, center photo, Keith Clodfelter was erroneously identified as James Duckworth.

In the November issue, the Wildcat RC scale model was described in the article subhead as requiring a Pee Wee .02, although text, plan, and cutaway drawing all said "TD." TD it is—there's a world of difference.

In the November issue Nats RC Pattern report, the references to Tony Bonetti were intended to mean that his flying skill is better than ever. Our apologies to Tony and anyone else who may have felt that something else was meant. Tony has an enviable track record in Pattern competitons.

Misfit/Randolph

continued from page 23

where ribs R2 are located, pin a piece of scrap 1/16 sheet between the trailing edge and the main spar. This is to hold rib R2 up from the plans, so when the 1/16 bottom sheeting is added later it will be flush. Glue the first regular rib near the center of the wing in place over the plan, and glue one of the plywood webs to it and the spar on its outboard side. The webbing makes an excellent spacer and assures that the ribs are perpendicular to the spar as well.

Continue adding ribs and webs out to the tip; there is no web between the last few tip ribs. After all ribs are in place glue in the top main spar. Be sure it is in good contact with the webs as well as the ribs. Glue a plywood web inboard of the first regular rib installed near the center section, and slide on the first R2 and glue it in place. Glue the top front spar in place and bevel the ⅛ sq. at the trailing edge to receive the top trailing sheet and glue it in place. The other half of the wing is assembled in the same sequence.

When both wing halves have been assembled, bevel the spars, leading and trailing edges where they will be joined to