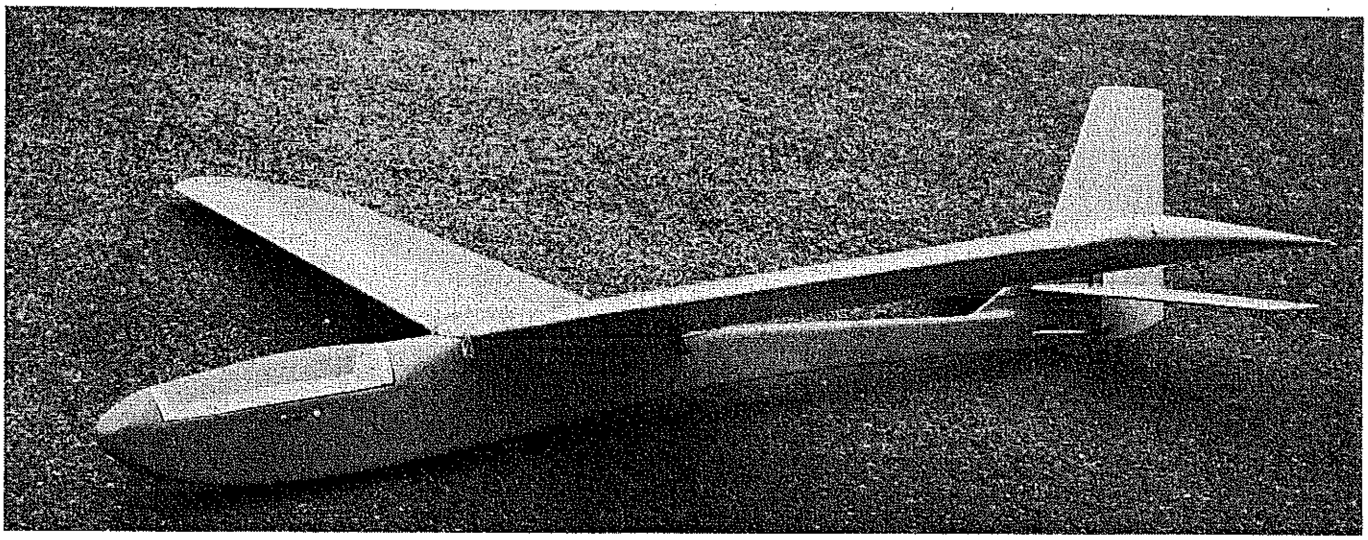
MOUNTAINEER

Slope soaring requires only wind and a convenient hillside. As the author states, the problem lies more in getting the model down than in keeping it up.

Clarence Haught

ALL MY MODELING LIFE I have been plagued by wind. Everytime I have had a new free-flight model to trim or the need to practice the pattern for an upcoming control-line meet, the wind foiled my efforts. A couple years ago fate intervened and my good Canadian friend Greg Davis introduced me to RC slope soaring. Greg had been riding down from Vancouver BC each summer on his motorcycle. This time he had a mysterious box lashed to the luggage rack. From it he produced a sleek

A final check of control movement prior to the launch. Surprisingly, many gliders are launched with transmitter and/or receiver turned off. Always launch directly into wind even if wind is coming in at an angle.



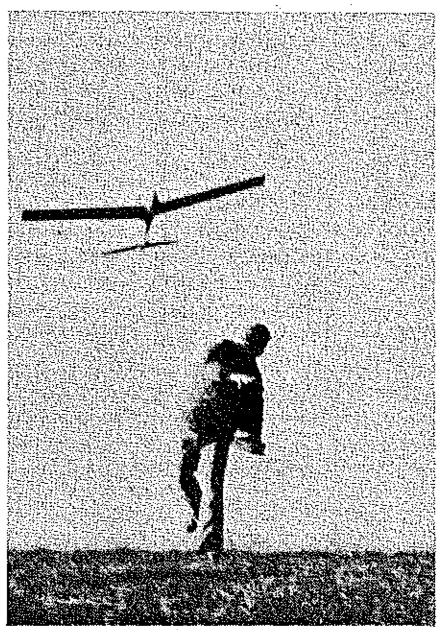
A slope soarer is a highly specialized machine. Mountaineer's wing loading of 14 oz./sq. ft. is well suited to wind velocities of more than 8 mph. Author prefers foam-and-paper panels because he finds it quicker to make a new wing than to repair an old one.

looking glider with low aspect ratio wings. We proceeded to the top of a nearby hill and I watched in utter amazement as Greg put his sloper through its paces. At last I could enjoy my hobby on windy days! Slope soaring requires wind! It also requires a hillside facing the prevailing wind.

Surface winds follow the contour of the terrain and thus provide an upwards flowing air mass capable of supporting a model which is really constantly descending within this rising air mass.

The problem will be getting the model down rather than keeping it up. If your available site has a plateau on top you can fly from the edge out over the slope and simply walk back onto the plateau area and land out of the area of rising air. If, however, your site terminates in a ridge there will be a very turbulent area at the ridge and you should fly from a point down the slope away from this turbulence. This requires a "hillside landing" and begins to separate the relatively delicate thermal soarers from the more rugged slope design.

My flying site is of the "ridge" category and I tore up a lot of gliders learning to land among the rocks and dirt mounds on the hillside. The Mountaineer is the third in a series of gliders designed specifically for the intermediate flier operating in less than favorable conditions.



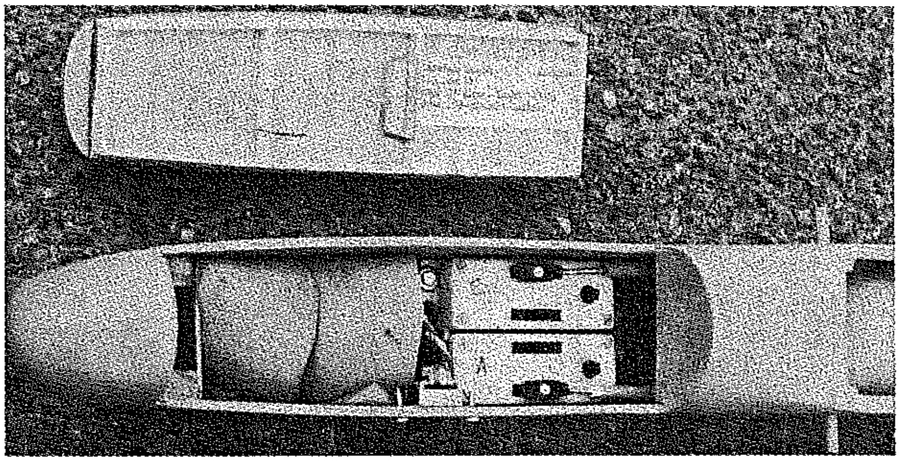
Beginning of another challenging flight. There is a slight ballooning tendency due to rising air—requiring slight down to avoid stall. The launching hand must be quickly diverted to the transmitter. Below: Low pass in front of flier. Turns should be away from hill until basic soaring techniques are mastered. Long gradual slopes like this one provide the smoothest air.

An enjoyable feature of slope soaring is the close proximity of the model to the flier. Most of the flight will be relatively into the wind so model orientation is easy to maintain. Slope soaring and acrobatics are very compatible and one can get a real workout on the slope as compared to the more gentle art of thermal soaring.

The Mountaineer's wing loading of 14 oz./sq. ft. is well suited to wind velocities of over 8 mph. The flat-bottom airfoil is responsive yet docile. I favor the foam and paper wing construction because one can build a new wing more quickly than repairing a wing damaged from a bad hillside landing. The all-flying stabilator provides smooth control response as well as good shock absorbing qualities for those hard landings.

Rudder area has been progressively increased to provide good low-speed control, particularly during the landing approach. All of the Mountaineer's predecessors, as well as the example in the photographs, have utilized 1/8" plywood for fuselage sides and bottom. This measure con-

tributes considerable strength. I utilized 1/8" mahogany door skins obtainable from the local lumber yard as a source of plywood. This material works easily, is fairly light, and is cheaper than balsa construction.



Ample room for the bulkiest radios is proven by accommodation of this early Heathkit system. Canopy retained by rubberbands. Return address is carry-over from many years of free flight.

Construction

Begin construction by cutting rudder and stabilators from medium 1/4" sheet balsa. Sand to shape and imbed 3/32" I.D. brass tubing using the control horn with 3/32" wire joiners installed as an aid in obtaining proper spacing and alignment. Use epoxy glue and balsa filler pieces to secure tubes.

Install Kleet aileron bearings as hinges in rudder using the 3/32" wire pin and the fin side hinges for spacing and alignment. Cover completed control surfaces with lightweight Silkspan.

Cut out fuselage sides from hard 1/8" sheet balsa or the aforementioned plywood. Note the fuselage outline between the wing mount and the canopy areas. Glue 1/4" sq. balsa longerons and 3/32 × 1/4" spruce canopy rails in place. Be sure to make one right and one left side.

While this is drying, fabricate the plywood fin assembly. If necessary, adjust the hole and slot spacing to fit the control horn you have available. The plywood formers F-1 and F-2 can be made up and drilled for control rod passage. The nose block is soft pine and can be laminated from common lumber stock.

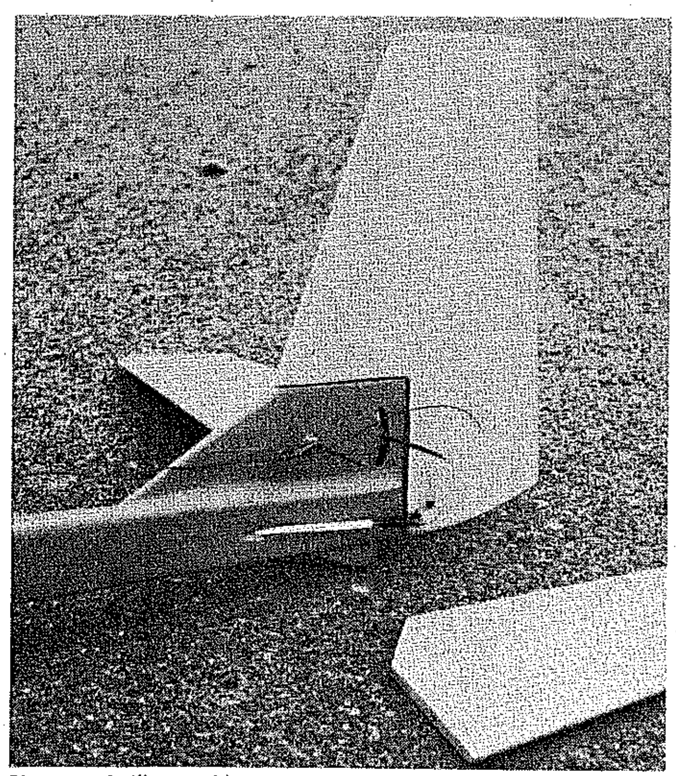
Prior to joining fuselage sides trim longerons to a triangle section from the point indicated aft. Join fuselage sides to F-1 and F-2 being sure to maintain accurate alignments. When dry, add nose block and plywood fin assembly with control horn held in place with short length of 3/32" I.D. brass tubing through the front pivot and secured with a washer soldered on each side. Note: This bearing is desirable but not required. If omitted secure control horn temporarily with a cotter pin.

Add top sheeting, dorsal fin and balsa block between wing and canopy. Sand excess balsa away. Glue in servo mounts and complete ballast box. Install radio gear temporarily. Mount rudder hinges to fin and install rudder and horn. Connect controls with Nyrod or your favorite equivalent. Use a fixed connection at the stabilator horn to prevent unwanted adjustments. Use an adjustable clevis at the servo end. Adjust control travel for 1 in. each direction on rudder and 1/4 in. up and 1/4 in. down for stabilators all measured at leading edge of surfaces. Anchor Nyrod housings well.

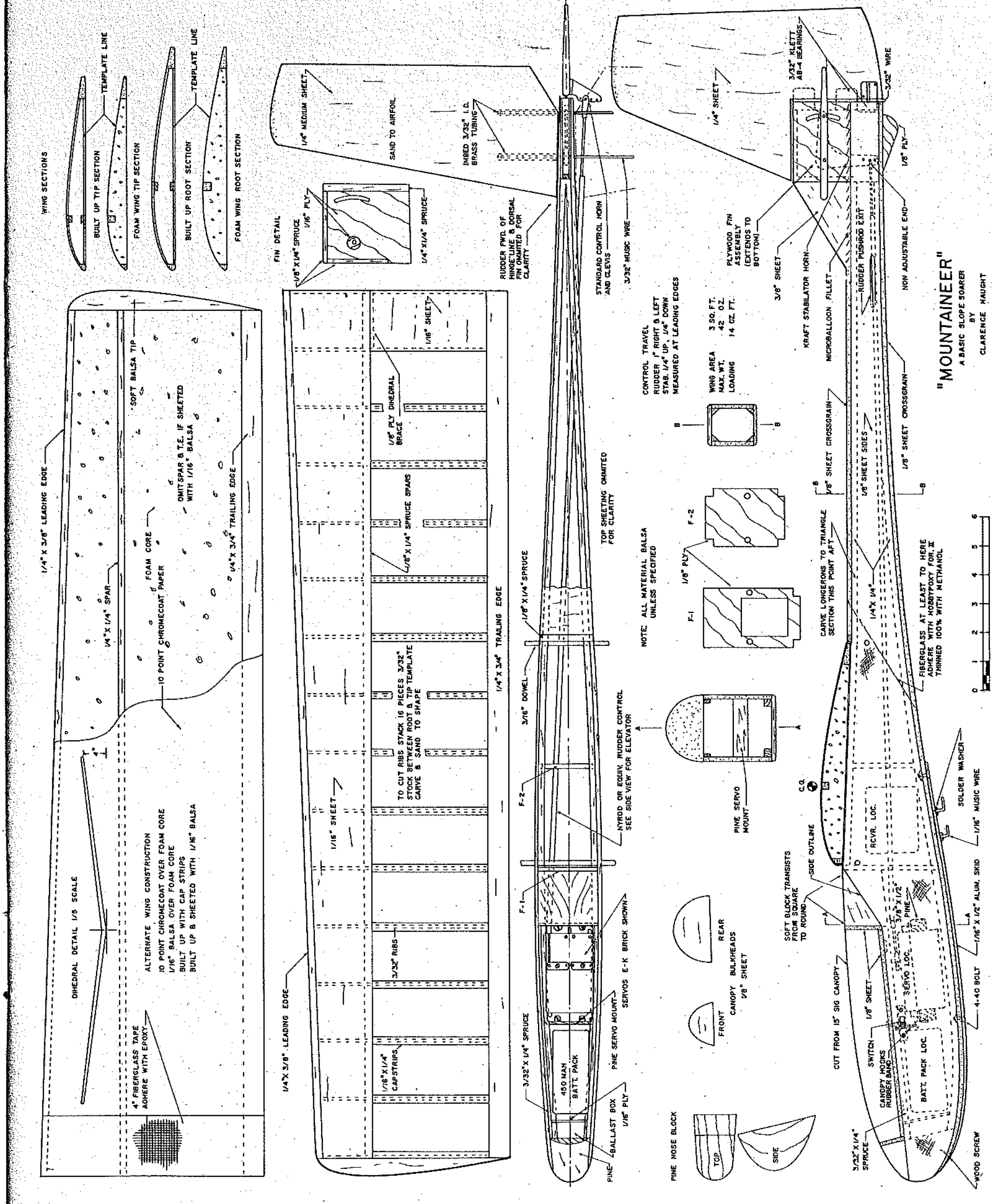
Remove radio gear and install bottom sheeting and tail skid. Drill holes for wing retaining dowels but do not install dowels until all sanding and filling is complete.

Build canopy frame in place to insure proper fit. Begin by protecting fuselage with Saran Wrap or equivalent. I prefer full length stiffeners beneath the canopy floor which automatically provide for alignment but you may wish to omit them and use small locating keys instead as the plastic canopy itself provides adequate rigidity. Fabricate canopy floor with 1/8" balsa crossgrain and add front and rear formers. Allow 1/32 in. for canopy thickness at all edges. Cut down a Sig 15-in. canopy to fit. I suggest reversing the canopy for a better fit (rear of stock canopy faces forward on glider). Prior to gluing canopy to floor install any desired detail and/or finish. I cover mine with contact paper. *Continued on page 97*

A rudder linkage adjustment brought about by the cold wind effects on nyrod pushrod guide transported to site in nice warm car.



Close-up of tail assembly reveals simple functional system—essentially an "all flying tail." Small fin houses the control horn.



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

From England, Glen Alison writes that he is building a new stunter with foam wing and Goldberg retracts. He states that he is using a clockwork timer and two microswitches. The batteries for the servo are going to be used as the wing-tip weight.

Is there enough increase in performance to merit the extra weight and mechanical problems? Good question. Price, Adamisin, and Davis are all former national caliber fliers (Davis is the only one still flying) and obviously were looking for something to add to their performance. Certainly, there is hope that the judges will be impressed with the retracts, enough to gain some extra points and maybe that few extra impression points that will spell the difference between mediocre and top contender. No doubt, the cleaner airframe will cut through the air with lessened drag, but there are those who feel that a certain amount of drag actually helps a stunt plane. Anyway, you probably won't see retracts on a stunter by Gieseke, Werwage or Jim Lynch. Bob Hunt was working on some retracts for his Genesis, but dropped the idea in favor of more practice for the '76 Nats. Judging by the results that might have been the better choice.

Profile Tanks: Charles Hubble wrote in from Baltimire, MD to offer some hints on profile tank mounting. First, he warns to make certain the pickup tubing is in the exact center of the tank in the V-shape section. Solder it there using solid solder and flux. Make certain the overflow tube extends to the top of the tank. (We always cut the tube at a 45-degree angle and then solder it to the top—WP.) He recommends soldering a piece of tubing bent into a 90-degree angle over the top vent to catch ram air. Charles stresses installation of the tank through a cutout in the fuselage so that the pickup tube is in direct alignment with the spray bar when viewed from the top. As has been the practice for years, the tank pickup tube should also line up with the center of the venturi when viewed from the side. However, the Slow Combat boys have been very successful using tanks with the pickup coming out the bottom of the tank to miss the cylinder head. Either way from the side view the center of the tank should line up with the venturi. And above all, make certain that the tank is clean, clean, clean on the inside before firing up for action.

Gieseke Nobler Plans: Tom Dixon announces that plans for the Gieseke version of the Nobler, as outlined in the December, 1976 and January, 1977 issues of *Model Aviation*, are now available for $5.00 each. Proceeds from these plans will go towards sponsoring the annual PAMPA stunt contests in Atlanta. Order from Tom at 9025 Hurst Court, Jonesboro, GA 30236; Tel: 404-471-3271. Write me for information on PAMPA or comments on stunt.

Wynn Paul, 1640 Maywick Drive, Lex., KY 40504.

Mountaineer/Haught
continued from page 34

Final sand fuselage and fair in fin to fuselage with microballons in 5-minute epoxy. Shape fillets with a finger dipped in dope thinner before they set up. Cover fuselage, at least to rear wing dowel, preferably completely to tail post, with 1-oz. fiberglass cloth adhered with Hobby Poxy Formula II, epoxy glue thinned 100% with methanol. When dry, sand smooth and fit up aluminum landing skid with towhook, if desired for high-start or winch launching. If you do not want a towhook you may substitute ⅛ × ½" spruce for the landing skid. Apply a filler coat of thinned Hobby Poxy Stuff. Sand well.

The plans indicate four optional wings for the Mountaineer: foam core with 10-point chromecoat paper, foam core with balsa, built-up with capstrips, or built up with sheet.

I heartily recommend the foam core with chromecoat. This wing is strong and by far the cheapest. The 10-point chromecoat is obtained at the local printshop at around 35 cents for a 20 by 30" sheet. It is fairly stiff and has a very slick high gloss finish on one side and takes paint well. Foam insulation sheets 1 × 24 × 96" are available from lumber yards and make good inexpensive wing cores. A 2-in. thickness is also available. The white "popcorn" foam is the lightest, being about 1 lb./cu. ft. The "blue" variety is a little heavier, about 2 lbs./cu. ft., but sands easier and is stronger. I normally use the white popcorn variety.

If you never have cut foam cores it's worth your while to give it a try. There have been many articles describing this technique and your cutter may be a very simple "bow" strung with nichrome wire or, in a pinch, .008 stranded control-line wire. Power can be anything from a variac to an automobile battery.

I cut my cores and glue on balsa parts with white glue in one evening. The next evening I sand the balsa to shape at the leading edge, touch up the cores with a

Continued on page 98

Continued from page 97

light sanding and cover with chromecoat. Using rubber cement for adhesive, coat both paper and wing core being sure it's dry before proceeding with covering. Lay bottom wing surface on chromecoat supported on flat surface and "roll" wing around leading edge and back across top wing surface. Take care not to twist any warps into wing. Your wing panels are now ready for joining. Sand bevel at butts to attain required 4 in. dihedral under each tip. Join with 5-minute epoxy and cover joint with 4-in. wide fiberglass cloth adhered with thinned epoxy. Epoxy tip blocks in place. Sand and fill and your wing is ready for finish.

If you wish to use a foam core covered with balsa, you may omit spar and trailing edge. If you desire a built-up wing, cut ribs to shape by stacking seventeen 3/32" balsa rib blanks between root- and tip-rib templates and carve and sand to shape. Lay down leading and trailing edges on plan, add bottom leading edge sheet and fit bottom cap strips. Glue bottom spar to sheeting and add ribs. When dry, add top spar and remove from plan. Build remaining wing to this stage and join with proper dihedral. Reinforce spar joints with a 3/32-in. dihedral brace cut to fit behind spars. Fit top leading edge sheeting, cap strips, and sheet center section. Glue wing tip blocks in place and sand completed wing to final shape.

Built-up wings with cap strips are satisfactory if your flying site is free of weeds and other sharp objects. The most rugged wing is the fully sheeted variety. The construction procedure is basically the same, except cap strips are replaced with sheet balsa. Make up your wing skins in advance of construction. Sheet balsa is not straight enough to join edge to edge without first trimming. To trim, overlap edges to be joined ¼ in. Lay your straightedge down the center of this overlap and run along the straightedge with a sharp knife or razor blade, thus trimming both edges at once. Any irregularities in trimming will correspond with the sheet to be matched resulting in a custom fit.

Lay down a piece of Saran Wrap, fit edges of sheet together and, while holding securely, join with Zap or equivalent. An alternate method of gluing is to join sheets with masking tape while flat. Pick up taped sheets, fold open at joint, and apply balsa cement. Lay sheets back on bench with tape side down and secure until dry. Remove tape and sand outside surface.

For the absolute ultimate in strength, cover sheeted wing with ¾-oz. fiberglass cloth adhered with Hobby Poxy Formula II thinned with 100% methanol, and brushed through the cloth. Finish your Mountaineer with your favorite materials. As of late I have been using thinned out Hobby Poxy Stuff for filling grain and discount-store spray-can enamel for color. These paints dry quickly and look great besides costing very little.

After finishing all components, reinstall radio and hook up controls, check for travel, and check assembled model for proper balance as noted on plans. Ballast as necessary. A little nose heavy is OK. A tail heavy model is disastrous.

Flying: Prior to launching from the slope, test glide model over level ground to determine if neutral control settings are satisfactory. The model should glide straight with no stall or diving tendencies. Adjust pushrods accordingly.

If you have not flown from the hill before I would offer these basic comments. Launch directly into the wind even if it is an angle to the slope. Be prepared to apply slight down elevator to avoid a stall as slopers tend to ballon on launch. To get familiar with the flight characteristics of the Mountaineer fly a figure-eight pattern 100-feet out from you, making all turns away from the hill. Let the model drift toward the slope as it crosses in front of you prior to turning into the wind for the next leg.

When flying back toward you or down wind, keep in mind the ground speed will be a sum of your normal flying speed plus that of the wind. The normal tendency is to slow the model to the apparent speed going into the wind, which is the normal speed *less* the wind speed, and can produce an unexpected stall.

If hillside landings are your only choice, I suggest landing from a low cross-slope pass with the nose of the model quartered into the wind while feeding in down elevator.

Don't forget your hot coffee, it gets chilly out there on the hill.

FF Indoor/Tenny

continued from page 38

actly correct. Stand back and visually inspect the wing alignment, then glue the wing to the posts and cabane. Fig. 8 shows how the wing should appear; note that the stands are just outside the dihedral joints so that the primary bracing wires can be attached before moving anything. Finally,

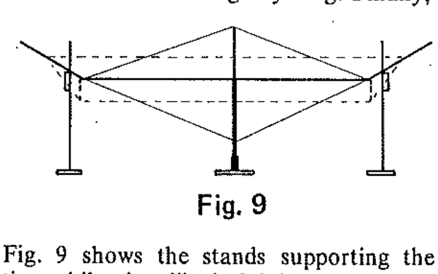


Fig. 9

Fig. 9 shows the stands supporting the tips while the dihedral joints are glued; dotted lines show secondary bracing if used.

Have Stands, Will Travel: By now, it is apparent that any *flat* surface at the con-