



AIRSTER

Introduction

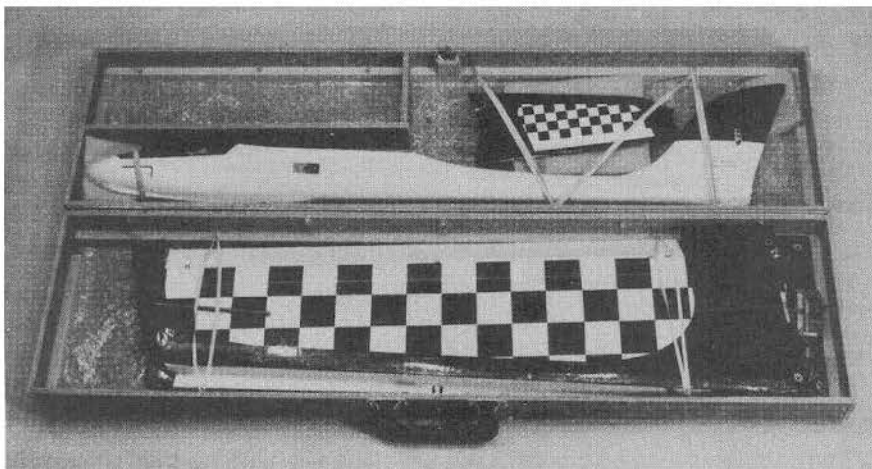
Maybe it's never happened to you, but it seems to happen to me on a regular basis. You'll be driving along on the coast, or maybe up in the hills, when suddenly you stumble across a perfectly soarable hill. The wind is perfect, the birds are having a great time, and there you stand watching and wishing. Wishing that you'd brought along your slope glider.

It's for moments like these that the Airster was designed. Although there are a lot of well-designed, fully aerobatic slope gliders commercially available, none of them can fit into a 34" x 9" x 4½" carrying case. (Because the Airster's so easily portable, you

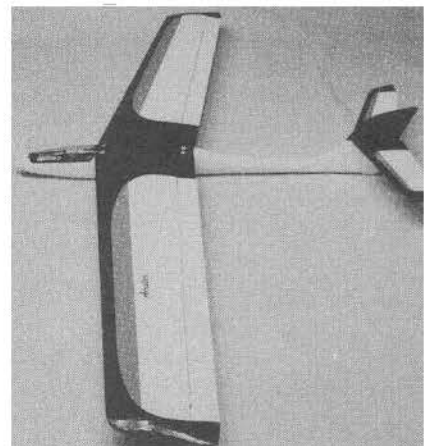
tend to take it with you more often than not.) They also can't match the Airster's broad speed range. At the lower end of its performance range, the Airster can stay up on the same lift as a Ridge Rat or a Katy II. However, at the upper end of its performance range, assuming the same wing loading, it can easily chase an SR-7 around the sky. How's that for a wild claim? The secret is in the 8% thick speed airfoil, rather than the conventional thick, semi-symmetrical, aerobatic airfoil. This airfoil, designed by Jack Caldwell, has a sharp entry which allows for excellent penetration. It tip-stalls at a slower speed than the Ridge Rat and does not have the nasty tip stall/spin combination of the

Katy II. When you stall it going into the wind, there is no tendency for one wing to drop before the other. All in all, the Airster behaves itself while being very aerobatic. While there is no such thing as a perfect slope glider, the Airster might make a good choice if your plans call for a vacation on the coast or in the mountains. I took mine to Hawaii and had a ball flying it in those warm tradewinds. The Airster has the FAI legal nose radius for sportsman class slope racing. At 15 ounces per square foot, it's much faster than an F3B Mini-Merlin similarly loaded.

The foam wing and fibreglassed balsa wood fuselage are straightforward, easy to build items, and the overall cost of this project is

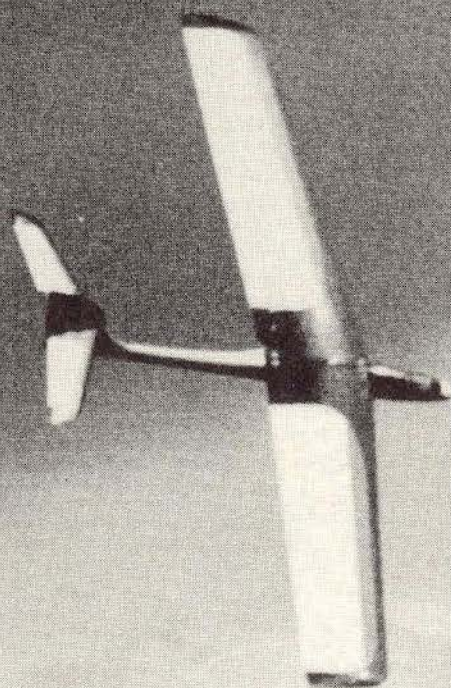
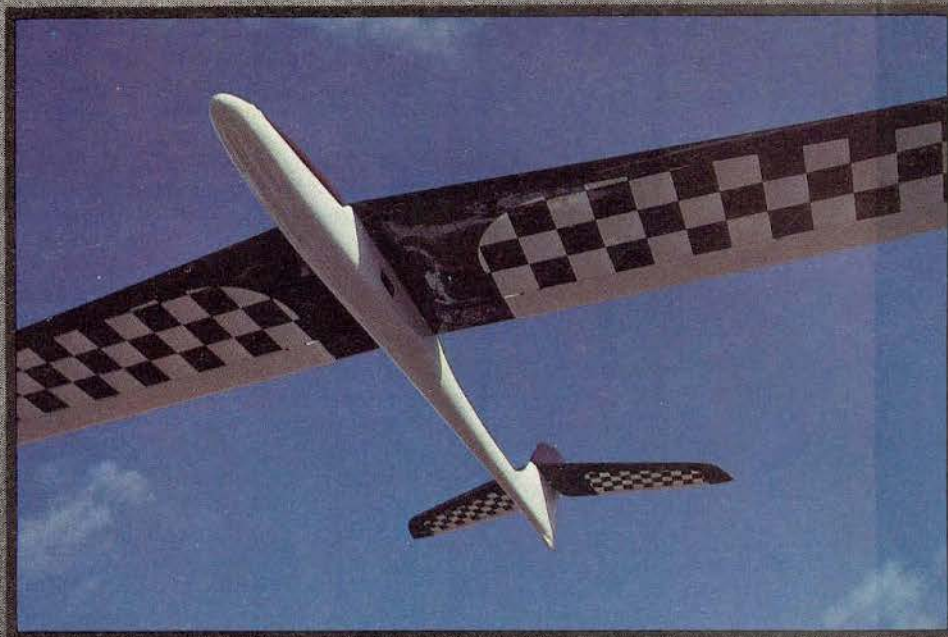


The Airster packed and ready to travel. The carrying case measures 9" x 4½" x 34".



The balsa sheeted foam wing and fiberglass over balsa fuselage are strong enough to withstand the rigors of slope soaring.

By Steve Calderon



The Airster was designed by Steve Calderon for a "take anywhere" slope soarer. Its fantastic performance along with being able to fit into a small box makes it a great addition to your stable of models.

AIRSTER

Designed By:

Steve Calderon

TYPE AIRCRAFT

Slope Soaring Glider

WINGSPAN

57 Inches

WING CHORD

Root 8"

Tip 6"

TOTAL WING AREA

400 Sq. In.

WING LOCATION

Shoulder Wing

AIRFOIL

JC8-4220-2.5

WING PLANFORM

Tapered L.E.

Swept Back

DIHEDRAL

Wing Inverted

1/2" At Center

O.A. FUSELAGE LENGTH

32 1/2"

RADIO COMPARTMENT SIZE

(L) 5 5/8" X (W) 1 3/8" X (H) 1 3/4"

STABALATOR SPAN

17 3/4 Inches

STABALATOR CHORD

Root 4"

Tip 2"

STABALATOR AREA

53 Sq. In.

STAB. AIRFOIL SECTION

Symmetrical

STABALATOR LOCATION

Midway on Fin

VERTICAL FIN HEIGHT

6 1/2 Inches

VERTICAL FIN WIDTH

3 3/4" (Avg.)

REC. ENGINE SIZE

NA

FUEL TANK SIZE

NA

LANDING GEAR

NA

REC. NO. OF CHANNELS

2

CONTROL FUNCTIONS

Aileron & Elevator

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Fiberglass over Balsa

Wing Foam w/Balsa & Fiberglass

Empennage Balsa

Wt. Ready To Fly 30 Oz.

Wing Loading 11 Oz./Sq. Ft.

quite reasonable. An easy to follow fiberglassing method is described.

So what are you waiting for? You say you're halfway done with your "Whistler 900"? Oh, well, don't let me disturb you. I just had to tell you about the Airster.

CONSTRUCTION

Wing Sub-Assembly:

Let's start by preparing your foam cores for the balsa sheeting. Sand away any irregularities on the core and make sure you have a flat building board to clamp the foam cores on. If you desire a one piece wing, leave out the joiner system and the 1/16" plywood root ribs.

Add the sub-leading edge (sub-LE) and sub-trailing edge (sub-TE) with 30-minute epoxy. While you're waiting for the epoxy to set, you can start cutting out the fuselage parts.

Trim the excess length of the sub-LE and sub-TE. Match them to the top and bottom contours of the foam core using a block plane and sanding block. Be careful not to damage the cores. Then add the 3/32" balsa tip and root ribs with 5-minute epoxy. Match the ribs to the core contours.

Next, add the fiberglass cloth disc on the top of the cores directly above where the tips of the wing joiner pins will extend. Use 5-minute epoxy and carefully sand smooth.

Edge glue your 1/16" balsa sheeting and cut out the wing skins with about 3/8" overlap all around.

Cut out the two 1/16" plywood root ribs.

Sheet the top of the foam cores first using Hi Johnson "Supertape," or your favorite wing sheeting adhesive. The foam core must be resting on its foam bed that it was cut from. My foam cores were cut with the tops of the cores facing each other. This allows you to sheet the top of each core separately, and then clamp or weight the entire stack as a unit. As a general rule, I've found that it's best to let the stresses in the sheeted cores relax for about 24 hours before sheeting the bottom. I also use about 30 to 40 pounds of evenly distributed clamping force.

Trim the excess top sheeting from the perimeter of the cores.

Flip the cores over and carve out the 3/8" wide slot for the wing joiner system. Be careful not to cut through the top sheeting or fiberglass disc.

Cut out the spruce spars, balsa shear webs (with grain aligned vertically), 3/16" diameter x 6" long joiner wire and two 3" long brass tubes.

Prior to installing the joiner system, shim the center section up 1/2" for the proper dihedral angle. Clamp the leading and trailing edges of each wing-half together to maintain the proper relative incidence. The dihedral really improves the handling and barely affects the inverted flight performance. Since most of your flying is upright, I consider the dihedral important.

Before you mix the 30-minute epoxy, I would fit the shear webs, top spar and joiner pin/tube in place to check that fit. You will need to make some tapered filler wedges from hard balsa to go between the brass tubes and the spars.

Roughen the outside of the brass tubes with coarse sandpaper, and epoxy the joiner system in place in two

stages.

The first stage will include the top spar, balsa filler wedge, balsa shear webs, brass tubes and joiner pin to provide alignment.

The second stage will consist of balsa filler wedge and bottom spar.

With the joiner system now installed, separate the wing halves and sand the lower spar or shear webs flush with the foam core if required.

Glass in the fiberglass disc as you did on the top, and sand smooth.

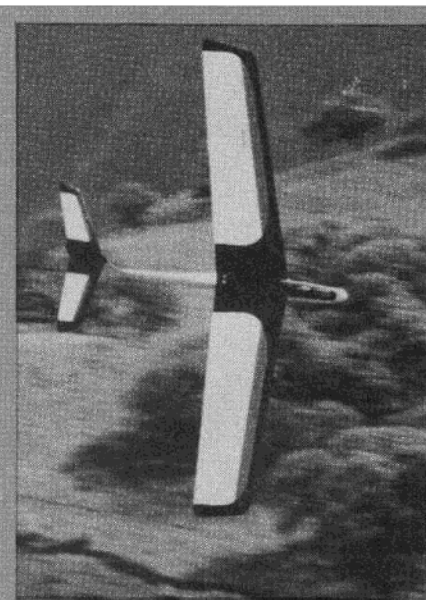
Now you can sheet the bottom of the foam cores. Clamp the entire foam core stack for 24 hours.

Trim excess sheeting and sand the perimeter flush.

Add the 3/16" x 3/8" spruce leading edge with 30-minute epoxy. Shape it after the epoxy cures to a sharp edge.

The forward wing hold-down blocks can be cut from 3/4" thick pine. Saw a 3/4" x 7/8" notch in each wing half as shown on the plans. Using 5-minute epoxy, add the forward wing hold-down blocks. Blend them to the airfoil contour. You will notice that there is a flat area where the wings come together directly over F-2.

Now, let's work on the back of the



Materials List

- 1 — 3/16" x 4" x 36" balsa
- 1 — 1/4" x 3" x 36" balsa
- 1 — 3/8" x 3" x 36" balsa
- 6 — 1/16" x 4" x 36" balsa
- 1 — 3/32" x 3" x 36" balsa
- 1 — 1/2" x 1 1/2" x 12" balsa
- 2 — 1/4" x 36" balsa trailing edge stock
- 4 — 1/4" sq. x 36" balsa
- 2 — 1/4" x 36" balsa triangle stock
- 1 — 3/8" x 36" balsa triangle stock
- 1 — 1/16" x 6" x 12" plywood
- 1 — 3/32" x 6" x 12" plywood
- 1 — 1/16" dia x 36" music wire
- 1 — 3/32" dia. x 36" music wire
- 1 — 3/16" dia x 36" music wire
- 1 — 1/16" I.D. x 12" brass tubing
- 1 — 3/32" I.D. x 12" brass tubing
- 1 — 3/16" I.D. x 12" brass tubing

wing. Using 1/4" wide aileron stock and 3/32" x 1/4" spruce, edge glue the two together. Make two assemblies. This will give you a 1/2" wide reinforced aileron. From these assemblies, cut out the center section trailing edge (CSTE). Make sure you're making a left-hand and right-hand piece.

Make the aileron torque links from 3/32" music wire. They are 4 1/2" long and have a 1/2" dogleg bent at 90°. Grind or file a flat on the end where the #4-40 threaded rod comes through the shaft collar and bears on the torque link.

Cut two pieces of 3/32" I.D. brass tubing 4" long and two pieces 1/2" long. Roughen their outer surfaces with coarse sandpaper.

Next, carve a groove down the center of the sub-TE and CSTE for the brass tubing to run through.

Notch the sub-TE and CSTE in the area where the shaft collar and #4-40 threaded rod will rotate back and forth. The shaft collar will have to rotate freely!

Cut out the 1/16" plywood wing reinforcing plates. Carve away the sheeting, 3/32" balsa root rib, sub-TE and CSTE to accept the inlaid 1/16" plywood wing reinforcing plates.

Let's leave this sub-assembly for now and start framing the fuselage.

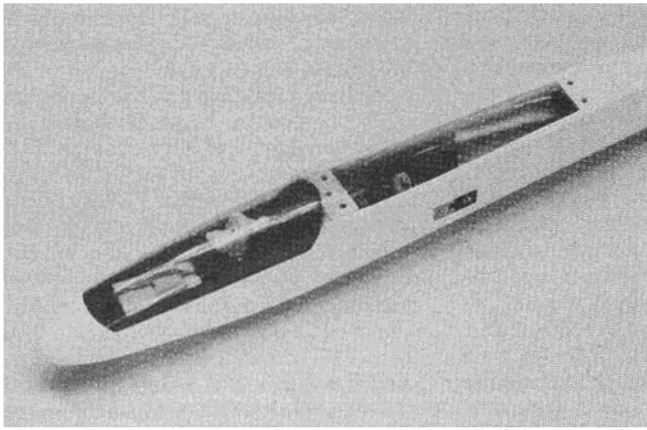
Fuselage Sub-Assembly:

Cut the fuselage and noseblock templates from the plans. Using rubber cement, glue the fuselage template to a piece of 3/32" x 4" x 36" light, but strong, balsa. In order to efficiently make the most of your balsa, one fuselage side should be laid out with the nose near the left side of the balsa stock, and the wing saddle near the top edge of the balsa stock. The other fuselage piece should be positioned with the nose pointing in the other direction and the wing saddle near the center of the balsa stock. By doing this, if the balsa stock is bowed, your fuselage sides can be assembled bowed inward an equal amount.

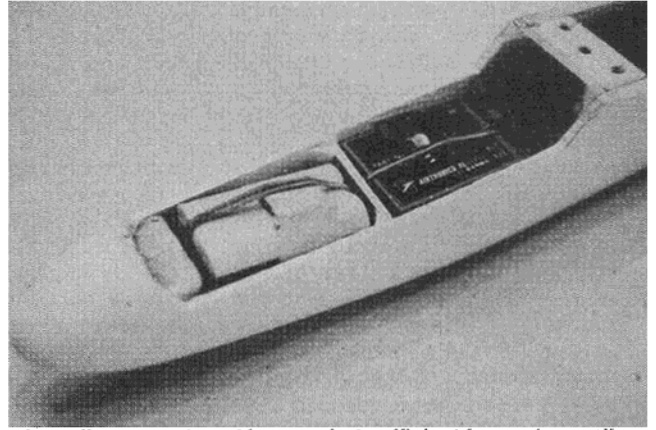
I've inadvertently built some cock-eyed fuselages by **not** doing this. After you cut out the sides, clamp them together and sand their edges as a matched pair. Before you remove the paper template, mark across the edges where the noseblock and formers will go.

After you have removed the paper template, use a gum rubber block to remove the excess rubber cement. Finish marking the inner faces of the fuselage sides to show where the noseblock and formers will go.

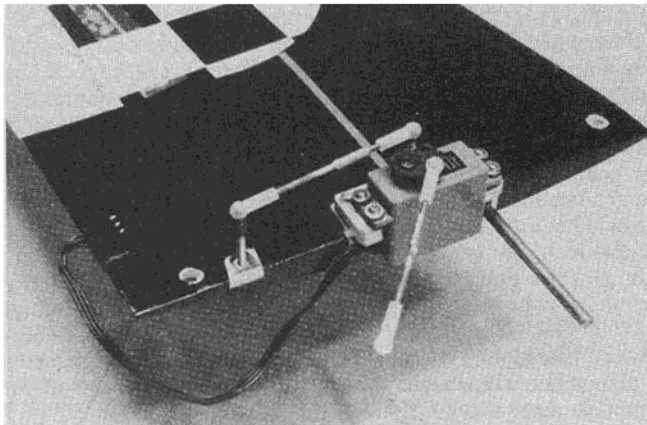
Before you cut out your formers, determine whether your stabilator drive servo and receiver can lay flat in the space shown. My Airster was built



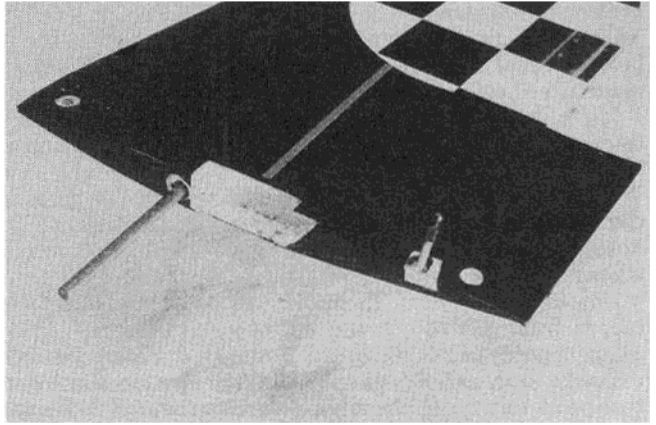
With Goofy as the pilot, the aerobatics will be a delight to watch.



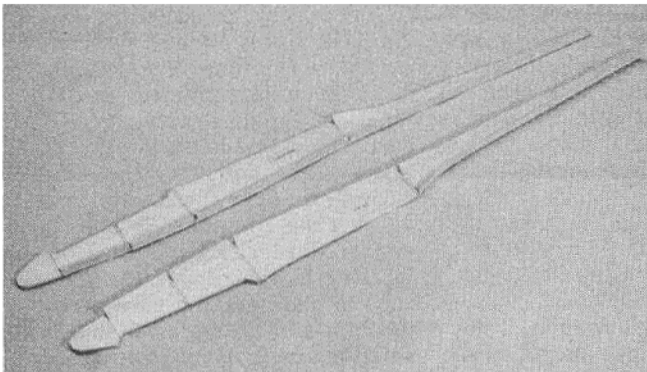
The radio compartment is snug, but sufficient for modern radios. Interior of fuselage is fibreglassed.



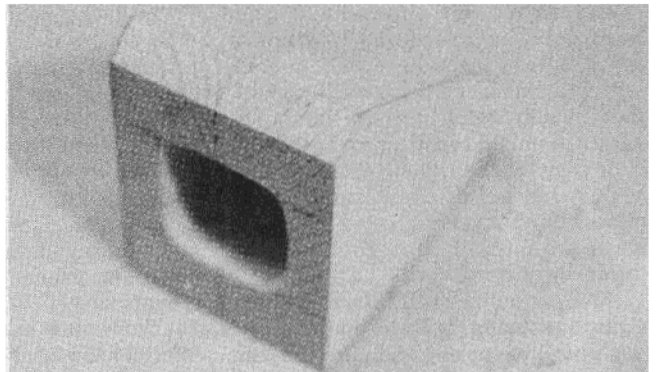
Aileron servo is mounted to right-hand wing. One ball link must be unsnapped to separate wing halves.



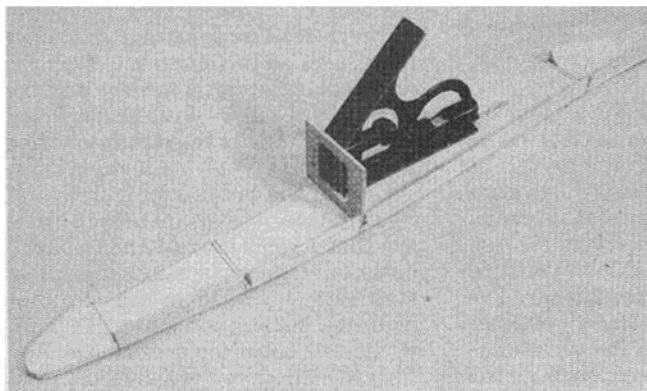
Left-hand wing is cut out to clear servo.



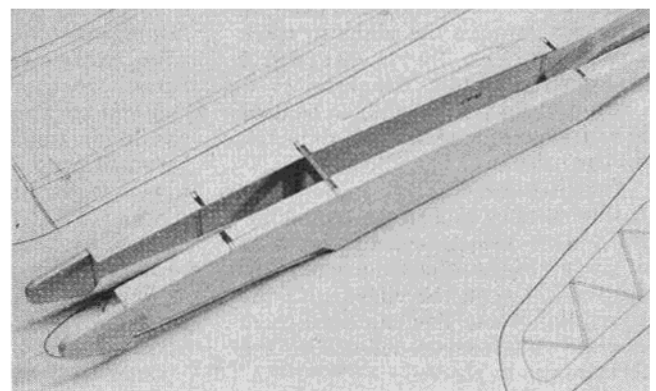
Fuselage sides are made from 3/16" balsa with triangular stock.



Nose block is made from 3/4" thick pine laminated together. The lamination glue joint serves as the vertical centerline when shaping.



Former 2 being installed.



Fuselage sides joined together using parallel reference lines to keep F-2 perpendicular.

around an Airtronics XL Series radio with mini-servos. The 2" fuselage width gives a nice rounded appearance when the shaping is finished. Remember to mark the vertical centerlines on the formers. They will help you line up the fuselage over the plans.

The noseblock is best made in the following manner: Start by sawing about 2" off the end of a pine 1 x 4. Then saw the piece in half. You will now have two pieces each 3/4" thick by 2" long and about 1 3/4" wide. Laminate these together with the two good edges even with each other.

You now have a 1 1/2" thick x 1 3/4" tall x 2" long pine block with one good edge, three sawn surfaces and the grain running along the 2" dimension. With the good, non-sawn edge as the bottom, sand the back square with respect to the sides and bottom.

The glue joint is now your vertical centerline and all dimensions will be in reference to this centerline.

Now, using rubber cement, paste the noseblock pattern to the blank noseblock and saw the outline as shown on the fuselage side view.

Now for the top view. The noseblock tapers from 1-3/16" at the battery compartment, to 1-1/16" at the front.

Carve out a 5/8" deep ballast compartment as shown on the fuselage side view. Leave a 1/4" thick wall on both sides of the ballast compartment.

There! Wasn't that easy? The noseblock is probably the most difficult part to make on the whole airplane, but if it's done right, it will produce a graceful fuselage when the sides are pulled together and glued to it. It sure makes the job easier if you have a Dremel disc/belt sander like mine. I have never regretted spending money on tools that remove the drudgery of handwork.

Now, cut out the tail fin parts using light, but strong, balsa. You probably don't need to cut out and glue the tail fin outer skin pattern. You can probably just transfer the four corners of the skin to balsa by laying the plans over the 3/32" balsa sheet and pushing a tee-pin through the plans to mark the corners. Then, using a straightedge, cut out the skins.

The tail fin post is going to be used as a fuselage spacer for the slot the tail fin fits into.

Framing the fuselage is next. It's best to start by gluing the triangular stock to the fuselage sides. Since some of the fuselage contours have shallow curves, just span the curve with the triangular stock. You can sand them to match the fuselage sides after the formers are in place.

In the tail boom area, you will notice that the triangular stock switches

from 3/8" to 1/4" about 2" back from F-3. The 1/4" stock extends an additional 7" into the tail boom. You will have to taper the thickness of the last 3" of the triangular stock. This will allow you to pull the fuselage sides together against the tail fin core.

Now, we are ready to start framing. Before I go on, I must warn you that squareness is very important in these next few stages. Your formers must be square and the fuselage must be positioned accurately over the plans. Any built-in errors now will be magnified later on, so take your time and do it right!

Glue F-2 to one of the fuselage sides. Use a square or drafting triangle to get it perpendicular. Then, place the fuselage sides upside-down over the top view of the plans. There are some parallel reference lines alongside the wing saddle area that you can align the fuselage sides with. Glue F-2 to the other side and clamp in place. Now, you should have two parallel sides with F-2 perpendicular to them.

Tack glue F-3 in place. This former will be removed after the fuselage is framed-up to enable you to pour expandable polyurethane foam in the tailboom.

Before you add the nose block, you better make sure to clamp the area near F-3. Be careful not to dent the balsa sides with your clamps. Add the nose block with 5-minute epoxy and clamp in place.

Add the 3/8" cross-grain balsa sheeting starting with the piece that straddles F-2. Next, pull the tail boom sides together using the 3/16" thick tail fin post as a horizontal spacer. You'd better cover the spacer with plastic wrap to keep from gluing it in place.

Fit the 3/8" balsa tail boom bottom by sanding it to fit the curve under F-3. The grain, you will notice, runs lengthwise.

For some strange reason, I've noticed several popular model kits that have the tail boom bottom sheeted cross-grain. It seems like every time you land one of them hard (i.e., crash) they always break the fuselage bottom in the area under the wing trailing edge. The cross-grain balsa is always the culprit.

If you stop to think for a moment, the loads imposed on a tail boom bottom during a hard landing will be tensile loads. Balsa is much stronger when it is loaded parallel to its grain. To my way of thinking, wouldn't you want the grain parallel to the applied load, rather than perpendicular? I've banged my Airster in a couple of times and I've never broken the tail boom.

There are some areas, such as the radio compartment and wing saddle area, where you can get away with

using cross-grain balsa because there is plenty of access room for installing stiffeners, etc.

Well, anyway, back to the tail boom. Glue the bottom in place, but make sure you don't get any glue on F-3. Now, you can remove the fuselage from the plans. Sand the edges of the sheeting flush with the fuselage sides.

Now it's time to start on the tail fin. Cover the plans with plastic wrap and pin the tail fin outer skin in place. Add the 3/16" x 3/8" spruce tail post. Add the 3/16" x 1/2" balsa leading edge. Add the 3/8" x 1/2" balsa top block.

Next, make the stabilator drive fitting from a Du-Bro or Goldberg solder-type clevis. This is done by placing a 3/32" thick spacer between the clevis plates and drilling a 1/16" diameter hole through both plates. The hole is 1/2" from the base of the clevis (the end with the soldering socket). Then, grind the overall length down to 5/8" in length.

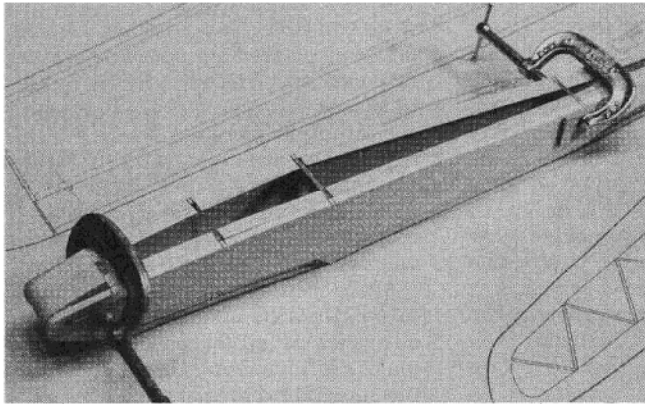
If this is beyond your means (i.e., no drill press) then use a piece of 1/8" brass tubing 5/8" long with the last 1/4" smashed flat. I feel the clevis supports the 1/16" stabilator drive pin better than the brass tube type fitting. It has two support points rather than one. The drive system is designed for $\pm 5/16"$ travel, so don't use drive fittings that are too long.

Cut the 1/16" cable and its sleeve to approximate length. Add the 3/16" x 1/2" balsa block that positions the upper end of the drive cable sleeve. Add the other locating blocks as shown on the plan. Then, using the compass mark provided, scribe the notch for the drive cable sleeve and carve the excess balsa away.

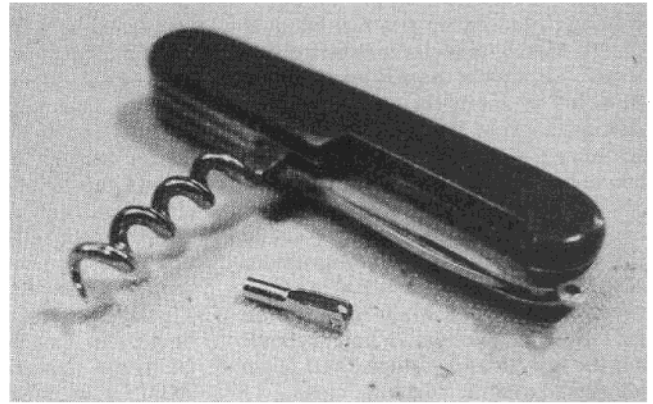
Carve the notch for the antenna tube also. Epoxy the stabilator drive cable tube in place. It should be centered in the thickness of the locating blocks. Epoxy the antenna tube in place making sure the curve near the tail fin top block is a fairly small radius. If you use a large radius, it might jam up the stabilator drive fitting at the top of its travel.

At this point, you better make sure your drive cable fitting assembly works freely. Once you seal up the tail fin, there's no turning back. With the drive cable fitting installed, add the left tail fin outer skin. Don't worry about the holes for the stabilator drive and pivot pins. We'll get to them later.

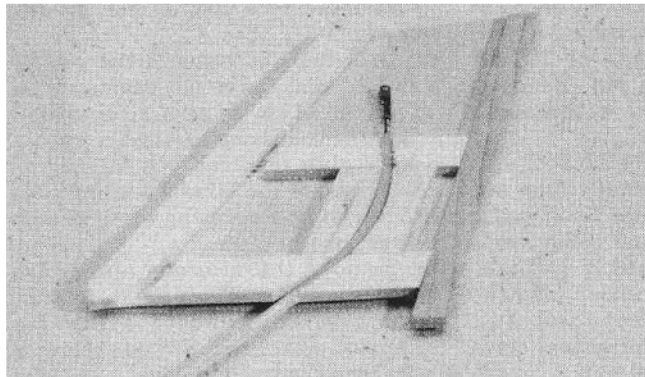
Cut out the tail boom top from 1/4" light, but strong, balsa. The 3/16" wide slot that accepts the tail fin is going to be the only thing that keeps the tail fin straight. I would make the slot accurate, but you can make the width of the tail boom top a little oversize. This will allow you to swing the front of the tail boom top left and right a little bit when you're lining up the fin.



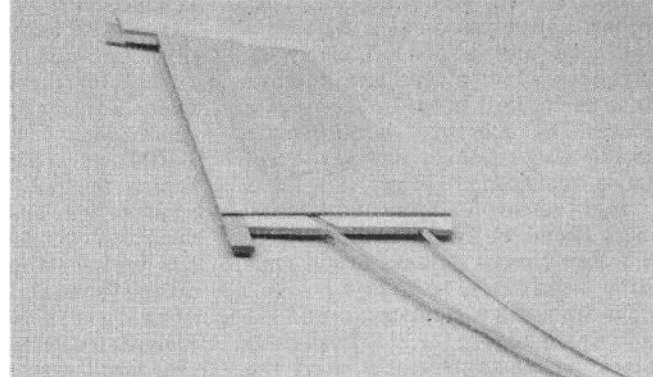
Nose block being installed. F-3 is only tack-glued in place. It will be installed permanently after tail boom has been back filled with expandable polyurethane foam.



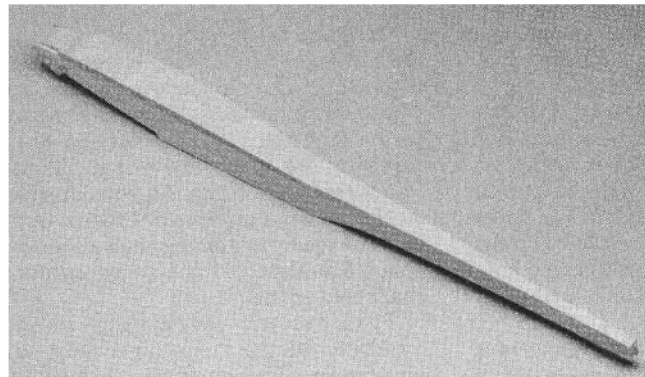
Stabilator drive fitting made from solder-type clevis.



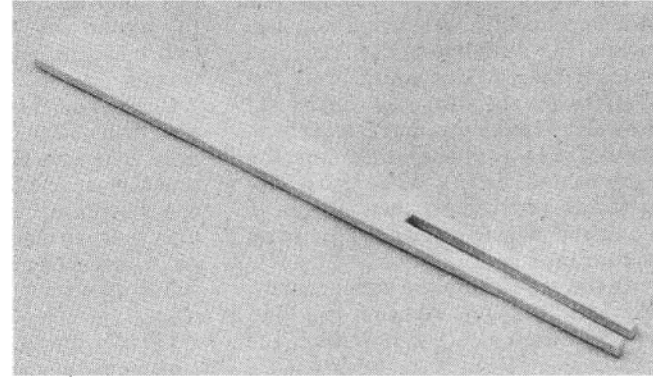
Tail fin assembly shows stabilator drive cable/sleeve positioned in its own slot. The antenna tube slot can also be seen.



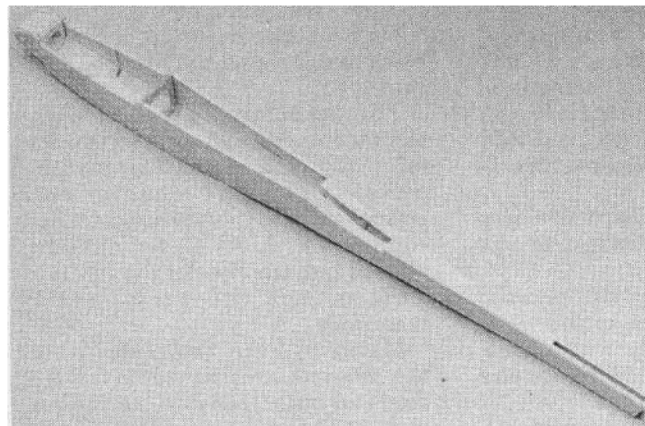
Fully sheeted tail fin with antenna and stabilator drive tubes in place; ready to be installed on tail boom.



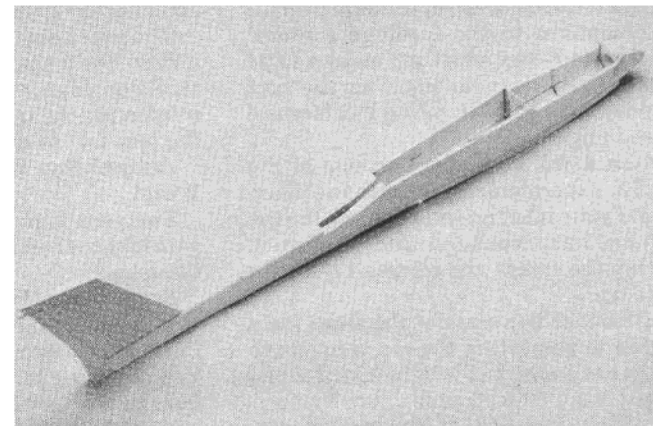
Bottom of fuselage fully sheeted and sanded flush.



Tail boom top is cut out from 1/4" balsa. The 3/16" wide slot for tail fin has been cut.



Tail boom top installed and pre-shaped. Be sure to use tail fin to insure correct alignment of slot.



Tail fin with outer framing members installed.

I usually shim up the tail boom to get the horizontal reference centerline level. This is a handy method of checking to see if the tail fin post is slanted back to its 20° angle. If you scale the plans, you will notice the tail boom bottom thickness tapers from 3/8" under F-3 and 1/4" under the tail fin post. Add the tail boom top using the tail fin in its slot for alignment. Use Titebond or a slow acting cyanoacrylate glue. Make sure the fin isn't glued in place yet. When dry, pull out the tail fin and sand the tail boom top flush with the fuselage sides.

Now is a good time to pre-shape the tail boom, or at least in the area where the fin is going to go.

Reinstall the tail fin; this time with epoxy. Before you add the 3/8" balsa tail boom piece aft of F-3, epoxy the stabilator drive sleeve and antenna tube to the tail boom in a couple of places. The tubes must be free to move in the wing saddle area. Add the 3/8" balsa tail boom top piece.

Add the tail fin fillet and trailing edge. Blend the fuselage sides into fin TE. You'll probably have to add some little balsa blocks to do this.

In the radio compartment, add F-1 and finish adding the 1/4" triangular stock where the formers meet the fuselage sides. Add the 1/64" plywood capstrips on the wing saddle.

It's balsa dust time! Shape the fuselage and fin. Although you can round the tail boom and fuselage bottom nicely, I've found that the areas under the wing and canopy can look slab-sided if you don't sand them. Even if it's a very shallow radius, the curvature helps break up the reflections on the finished surface to give it a pleasing, rounded appearance.

In the area where the wing, canopy, F-2 and fuselage side come together, you will want to blend in a bit of the corner.

After the fuselage is shaped, add the tail skid and nose skid. You may have to kerf the backside of the skid to get it to conform to the fuselage contour. Remove F-3 by whittling away a little bit of the triangle stock on the port side. Then you can swing F-3 forward and out.

Mix two 3/8 ounce portions of Sig 25X expandable polyurethane foam and pour into the tail boom. After the foam has expanded and hardened, trim the excess and reinstall F-3 with epoxy.

Most of the mass of the fluid foam goes to gas during the reaction and so the net amount of weight added to the tail boom is negligible.

The strength of the tail boom, however, increases dramatically! I haven't done any load testing, but I would imagine the strength is

increased by a factor of five.

If I may digress for a moment, let me state that the increase in strength comes from the fact that the foam-filled tail boom can't buckle under severe bending loads. This allows you to load the tail boom up to the tensile limit of the balsa. A non-foamed tail boom buckles near the glue joints, usually before the tensile limit of the balsa is reached. This construction trick is probably the best idea I've borrowed from Jack Caldwell, designer of the AR-1 (see RCM October '82).

Stabilator:

The stabilator is a straightforward assembly that shouldn't give you any trouble. Start by cutting out the 3/32" I.D. by 1/4" long brass tubing for the pivot pin, and 1/16" I.D. by 1" long tubing for the drive pin. Roughen their outer surfaces with coarse sandpaper.

File away a portion of the 3/32" I.D. tubing to allow the shaft collar set screw to bear against the 3/32" music wire pivot pin. The shaft collar keeps the tail feathers snugly in place during flight. As a reminder, after the stabilators are finished and MonoKoted, glue the pivot and drive pins into the starboard half.

Select light, strong, and flat balsa for your stabilators. Cut out one stabilator and use it as a pattern for the second one. Match their outlines and lightening contour to insure equal weight.

Cut the notches for the brass tubes and shaft collar. The tube centerlines are 1/8" apart. Shim the tubes up so that they are centered in the balsa and epoxy in place. Use the pivot and drive pins to insure alignment. Be careful not to get epoxy in the set screw hole when epoxying the shaft collar in place.

I would try to keep the epoxy to a minimum to save weight. Use scrap balsa as filler pieces. Add the 3/32" balsa diagonal ribs and then shape the stabilators.

Shape them to a symmetrical airfoil. Use a sharp entry and a sharp trailing edge. A handy means of reinforcing the trailing edge is to soak the last 1/4" of chord with Hot Stuff.

Assembling Wing & Fuselage Wing:

The next logical construction step would be to fit the wing to the fuselage.

Begin by adding the 1/16" plywood wing reinforcing plates to the wing. Place plastic wrap on the wing saddle. You are going to use the fuselage as a form to position the plates.

With the wing halves assembled, check to see that the reinforcing plates fit properly, then epoxy them in place. I assume you've already notched the

wing and CSTE to accept not only the plywood plates, but also the torque link assembly? Good! Add the torque link assembly and CSTE. Make sure the torque links rotate freely.

Add the hard balsa wing tip blocks and match to the airfoil. Separate the wing halves and add the 1/16" plywood root ribs. Drill out the hole for the wing pin.

Make your ailerons next. Cut them to length with about 1/16" working clearance at either end. Be sure to make a left hand and right hand one. I recommend hinging the ailerons with Robart Steel Hinge Points, catalog number 308, 1/8" diameter, three places in each wing. These hinges contribute to a flutter-free aileron system.

Drill the 1/8" holes in the sub-TE and aileron. Carve out the notch for the 3/32" I.D. brass aileron drive tube. Hang the aileron on its hinges but don't glue in place yet. Blend the thickness of the aileron leading edge to the wing. Epoxy the brass aileron drive tube in place.

Remove the ailerons and finish shaping them. Their leading edge must be rounded to allow for approximately ± 30° movement. Sharpen the trailing edge.

Now you can glass the wing center section. Refer to the Fiberglassing Section.

After the wing center section has been fiberglassed, fit the aileron servo to the wing. Cut out the wing to accept your aileron servo. Make the C-shaped servo mounting plate. Mount the servo in the starboard wing. Then, solder the drive links. As you can see on the plans, a differential throw can be achieved by mounting the ball links about 30° ahead of the servo output shaft centerline.

This set-up gives very good handling in the turns and reduces adverse yaw. You don't want to overdo the aileron differential, however, because eventually it will affect the straight-line rolling ability.

Let's put the wing aside for the time being and work on the fuselage.

Fuselage:

The stabilator drive servo is mounted on its side to a removable 3/32" plywood plate. The plywood plate, in turn, is mounted to a permanent 3/32" plywood plate that is equipped with #4-40 tee-nuts and glassed into the floor of the fuselage. This makes the servo easily removable.

Match-drill the two plates where the tee-nuts are located with 1/16" diameter drill. Then drill out the base plate to fit the tee-nuts. Drill out the removable plate with a 1/8" diameter drill for the #4-40 screws.

receiver, it may be necessary to route the excess wiring back into the wing saddle area. Slip the antenna into its tube.

Trimming:

Before you balance the airplane it's a good idea to measure the actual amount of sweep-back in the wing trailing edge. It should be around 2". If it's more than 1/4" off, move the balance point accordingly. For example, if the sweep-back measures 2 3/8", then move the balance back 3/16" from the mark on the plans. A balancer made of 1/4" dowels mounted on a board gives you a more accurate location than just holding it by your fingertips.

The stabilator incidence should be adjusted for -1° . The stabilator throw should be $\pm 1/2"$ when measured at the trailing edge. The ailerons should be adjusted to give 1/2" up and 3/8" down travel.

Flying:

Test fly your Airster on a day with decent lift. It's very difficult for a beginner to fly a heavily loaded airplane in light lift! Keep your turns shallow (30° bank maximum). A good strong toss on launch and a brisk cruise speed should keep you out of trouble. The speed airfoil likes to whiz along, but it can fly slowly. Just be conservative on your first few flights.

If your flying experience has only been with slower airplanes with thick, blunt entry airfoils, you'll be in for a pleasant surprise. The faster the Airster goes, the more lift the wing generates. Although you pay for the extra lift with extra drag, it's not a sizable increase in drag. As a result, you'll find it easier to gain altitude by flying faster than the minimum sinking speed.

This may seem like blasphemy to the believers of established, computer generated airfoils, but it has worked for me and for Jack Caldwell. Between the two of us, we've built close to ten airplanes with sharp entry airfoils and definitely prefer them to thick, blunt entry airfoils.

Before you get carried away with aerobatics on your first flight, I would practice stall recovery and slow flight. One of the most common errors in flying an Airster is flying it too slow. It may pitch its nose up slightly or even climb a little bit, but you'll discover that you're using up all your elevator control, and then, whoops, it stalls.

The stalls are easy to recover from and there is no tendency to drop a wing and spin.

Tip stalls in turns are good maneuvers to practice and, here also, you won't have any trouble during recovery. I expect you'll have a ball with your Airster.

See you on the slopes.

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