

# TROPIC-AIRE



While it has been said many times that pattern flying is 95% pilot and 5% airplane, I have found it to be true that the finest pilot around is hard pressed to perform well without a clean flying, straight and true airplane.

I can provide you with a clean flying, attractive, proven contest winning design and instructions for its assembly; however, I cannot guarantee it to be straight and true, and I cannot guarantee you it will win for you. The straight and true aircraft can only come from your own careful construction and the winning can only come from your own long hours of practice.

The Tropic-Aire is an aircraft whose performance is limited only by the ability of the pilot. With proper balance and trimming, it will perform hands off take-offs that seem to fly right off the ground rather than jumping or lurching into the air as is common with many designs. Landings are a breeze for the Tropic-Aire. With a small amount of elevator trim, it will fly hands off on approach with the only needed control being to flare the aircraft just before it touches the ground for a nice, slow, full scale type landing.

In addition to its superior landing and take-off abilities, it will perform all maneuvers in the AMA pattern with a flare and grace that is equaled by few of today's designs.

Tropic-Aire's built-up fuselage has

evolved from many years of experience building pattern aircraft and is what we feel to be the lightest as well as the strongest method available. You'll notice, while examining the plans, that there are only two formers in addition to the firewall and you see virtually no solid blocks anywhere. What we are doing is using triangle stock balsa and light sheet balsa to build a strong, durable shell and cutting out all of the dead weight.

The Tropic-Aire that I am currently flying is powered by a Speed Webra with a JCM tuned pipe, has Kraft Multicon retracts and a Kraft radio and weighs only 7 lbs., 11 oz. With that combination you can imagine the power it has! Who says a pattern ship won't fly unless it weighs 8 lbs.?

Before actually beginning construction, thoroughly familiarize yourself with the plans and use them with this article to get a good understanding of all construction details.

You are now ready to proceed to the local hobby shop with materials list in hand. Be sure to get everything you need before you start construction so you won't lose an evening's work because of something you forgot.

You should be able to build the fuselage in about three evenings, the stab and fin in one, and the wing in two. You will probably spend about two evenings on assembly. So there you are with a new pattern ship, ready

to finish in about eight days.

One final note before jumping into construction. I have been using Titebond Glue with much success for many years. I do about 90% of my building with it and recommend it where I have not called for another brand.

#### Fuselage:

Lay out one side of the fuselage on a 1/8" x 6" x 48" sheet of medium balsa. You can do this by tracing and cutting out a pattern from the plans, or by marking the centerline of the fuselage on the balsa and then marking the former and firewall locations perpendicular to it. You can now take this and plot the curve of the outside edge of the fuselage side. The critical thing here is to be absolutely sure the wing saddle and the horizontal stabilizer saddle are **exactly** parallel to the centerline.

Take as much time and pain as is necessary to locate these as it will save you much time and sanding to square them later.

I prefer to pin two sheets of balsa together and cut them simultaneously on a Dremel saw. (You can also use this method to cut two or three sets of fuselage sides once.) If you don't have a Dremel saw, or prefer to cut the sides individually, then cut out one side very carefully and use it as a pattern for the other. After cutting the sides out, light sanding may be required to get a perfect match, carefully mark the centerlines and formers on the second side of the fuselage

A Pattern Aircraft Whose Performance Is Limited Only By The Ability Of The Pilot. The Tropic-Aire Tied For Second Place In The RCM 1979 Design Contest --- By Chris Lakin.

(Photo 1).

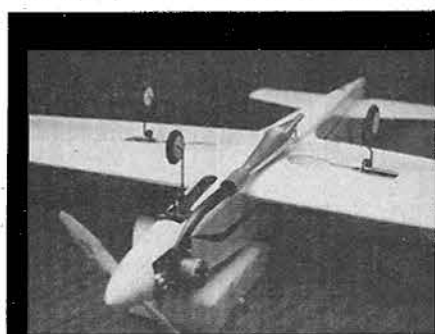
Now cut out the plywood doublers for the fuselage sides. You will have enough wood to do this from one sheet of 1/16" x 12" x 24" plywood. An easy way to make these doublers is to trace the outline of the fuselage on your plywood, then lay your triangle stock on this line and mark the inside line with it as a guide. Again, the critical thing here is to be absolutely sure that the wing saddle and the horizontal stabilizer saddle are exactly parallel to the centerline of the fuselage. The front end of your doubler (remember your firewall butts to this) should be square with the centerline. These may also be cut in pairs as described for the fuselage sides (Photo 2).

When, and only when, you've carefully checked all of this for square you are now ready to put the fuselage sides and the plywood doublers together. For this use a high grade of contact cement. I prefer Southern's Sorgham (Photo 3).

You are now ready to glue the 45 degree triangle stock to the fuselage sides. The 45 degree triangles that go over the curved part of the top of the fuselage sides will need to have slots cut in them to help them bend easier. These slots should be neither too deep (leave at least 1/8" of balsa uncut) or too close together (approximately 1"). You can cut with a Dremel saw. As you're installing the 45 degree triangle stock be sure to check the fit as you may need to plane the inside edge of the triangle slightly to insure a close fit with the outside edge of the fuselage (Photo 4).

You are now ready to install the interior triangle bracing. **Do not omit this!** This is very important for alignment purposes as well as added strength for the formers and firewall. The key here is to get good tight miter joints with the outside triangles. This will add much strength to the overall fuselage. The 1/8" x 1/2" strips in the rear will give the fuselage sides the strength of formers without the weight or alignment of them (Photo 5).

At this point stop and carefully inspect what you've done. You should have two identical fuselage sides (well, almost identical --- one left and one right) with the ends of the triangles trimmed away. You should now plane the rear edges of the triangles that will cause interference when



#### TROPIC-AIRE Designed By: Chris Lakin

TYPE AIRCRAFT	Pattern
WINGSPAN	60 Inches
WING CHORD	12 Inches (Avg.)
TOTAL WING AREA	720 Square Inches
WING LOCATION	Low Wing
AIRFOIL	Symmetrical
WING PLANFORM	Tapered
DIHEDRAL, EACH TIP	1 1/2 Inches
OVERALL FUSELAGE LENGTH	53 Inches
RADIO COMPARTMENT AREA	(L)13 3/4" x (W)3 1/2" x (H)3 1/2"
STABILIZER SPAN	24 Inches
STABILIZER CHORD (incl. elev.)	6" Average
STABILIZER AREA	144 Square Inches
STAB AIRFOIL SECTION	Flat
STABILIZER LOCATION	Mid Fuselage
VERTICAL FIN HEIGHT	7 Inches
VERTICAL FIN WIDTH (incl. rud.)	8" Average
REC. ENGINE SIZE	.61 Cu. In.
FUEL TANK SIZE	16 Oz.
LANDING GEAR	Tricycle (Retractable)
REC. NO. OF CHANNELS	5
CONTROL FUNCTIONS	Rud., Elev., Throt. Alt., L.G.
BASIC MATERIALS USED IN CONSTRUCTION	
Fuselage	Balsa and Ply
Wing	Balsa and Ply & Foam
Empennage	Balsa
Wt. Ready-To-Fly	120 Oz.
Wing Loading	24 Oz./Sq. Ft.

the tail cone is pulled together (Photo 6).

If you're satisfied with what you have at this point, you are ready to join the two fuselage sides. The best method for this is to lay one side out flat and glue the two 1/8" plywood formers to it. Use a square to insure the formers are square with the sides of the fuselage. These should be completely dry before joining the other side to the formers. If everything up to this point has been done correctly, the two sides will fit together like a glove (Photo 7)

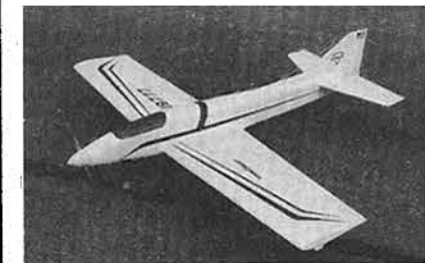
Cut the firewall to the shape on the plans from 3/8" thick plywood. (Two pieces of 3/8" ply, laminated.) You will now need to miter the edges of your firewall so it will tightly fit your fuselage sides.

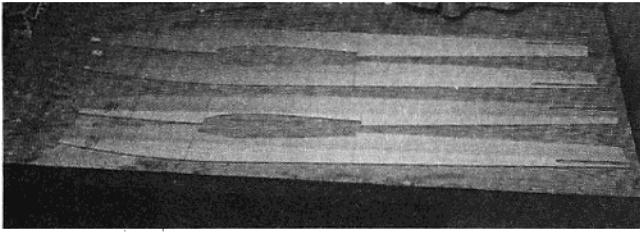
When this is done, you are ready to pull the nose and tail cones together. I normally use Con-Ap epoxy for this job. It is a very thick, gel-type compound that is excellent for filling small voids if the firewall doesn't fit quite as tightly as you'd like.

You are now ready to put the top sheet on. Take a piece of 1/4" x 4" x 48" light grade balsa and rough cut it to the shape of the fuselage. Wet the top with a spray bottle to help it bend over top of the fuselage. (Ammonia mixed with water works well.) The best method of holding the top sheet down while the glue dries is to use pieces of 3/4" pine approximately 3" x 12" laid across the top sheet and tightly rubberbanded around the bottom (Photo 8).

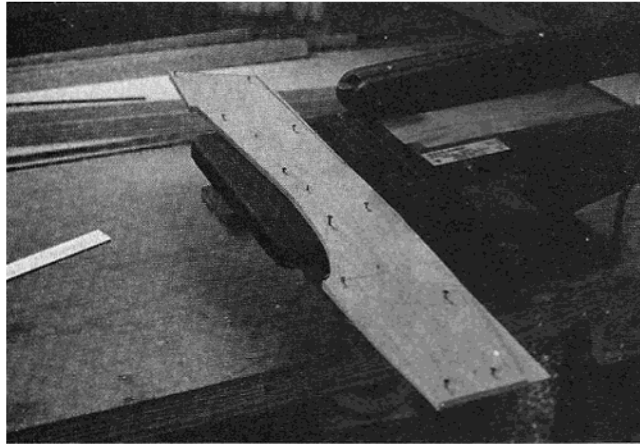
The bottom sheet is the next to be installed. For this I prefer to use 1/32" plywood. It weighs no more than 1/8" balsa and, when coupled with the plywood skins used on the wings, gives the Tropic-Aire a very tough underside. This is extremely helpful in keeping your airplane looking nice and new. Our local field is a little rough, with small pebbles, and the plywood has proven itself far more durable than balsa used on previous ships.

It is now time to fit the 1/16" plywood for the fuel tank compartment and to install your nosegear. I use Kraft Multicon's and install it by building a box out of 1/8" plywood slightly larger than the outside dimensions of the landing gear. The box should be reinforced with balsa as shown on the plans. After completing, slide the nosegear into the box. You can now locate one of the side housing screws on the retract

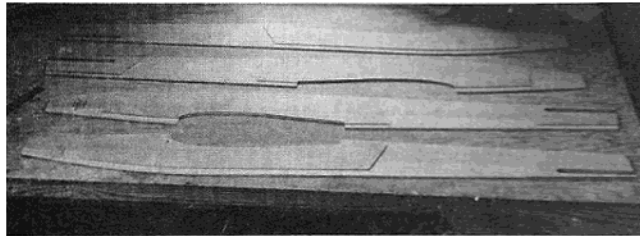




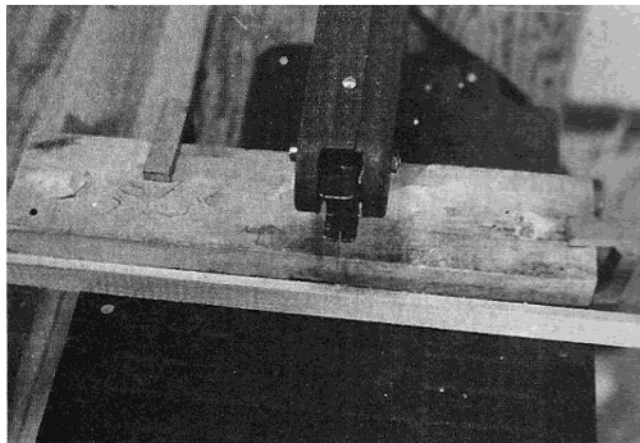
**Photo 1:** . . . Light sanding may be required to get a perfect match, carefully mark the centerlines and formers on the second side of the fuse.



**Photo 2:** Plywood doublers and fuse sides may be cut simultaneously with a Dremel saw.



**Photo 3:** Fuse sides with plywood doublers in place.



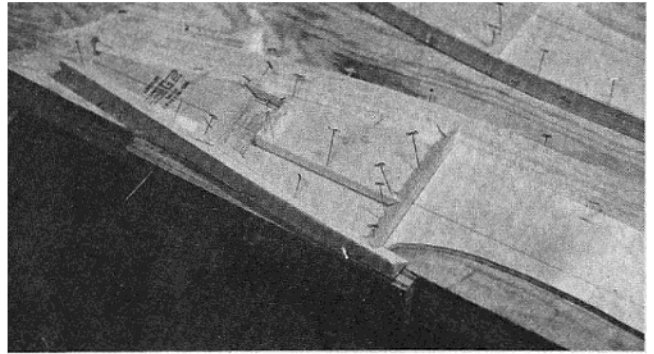
**Photo 4:** A simple jig for slotting triangles can be made by clamping a piece of hardwood to your Dremel saw for a guide.

on the side on the fuselage. Drill a 1/8" hole in this location. Countersink the head of the screw to the outside edge of the plywood box. Small pieces of foam rubber can be

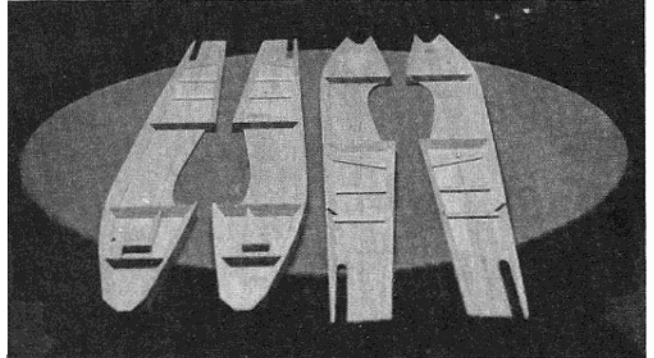
wedged between the landing gear and the box for a tight fit. You now have a nosegear that can be removed with only one screw and without removing the engine. This can

prove invaluable if nosegear maintenance is required between rounds at a contest.

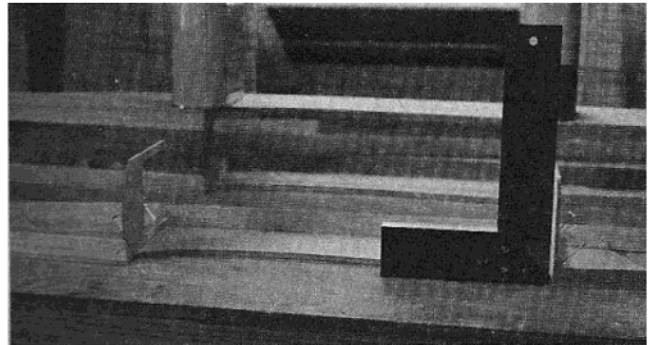
After the preparation for the nosegear is to your satisfaction put on the 1/4" balsa



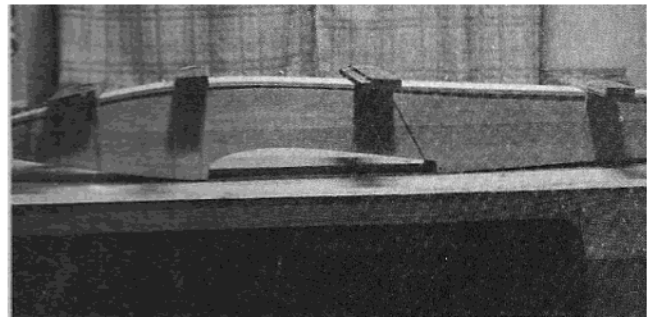
**Photo 5:** . . . the key here is to get good, tight miter joints . . . Also, a quick way to add 3/4" to your workbench.



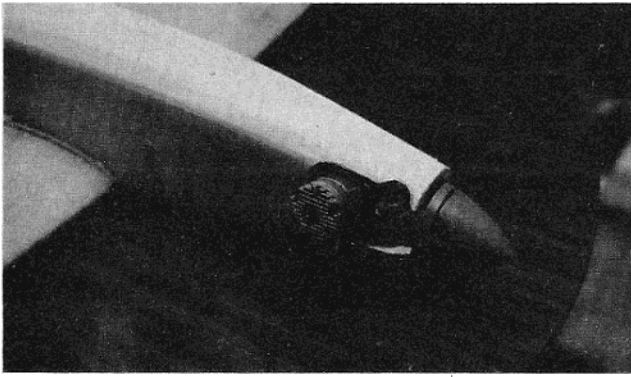
**Photo 6:** . . . Identical fuse sides with ends of triangles trimmed away . . . plane the rear edges of the triangles that will cause interference when the tail cone is pulled together.



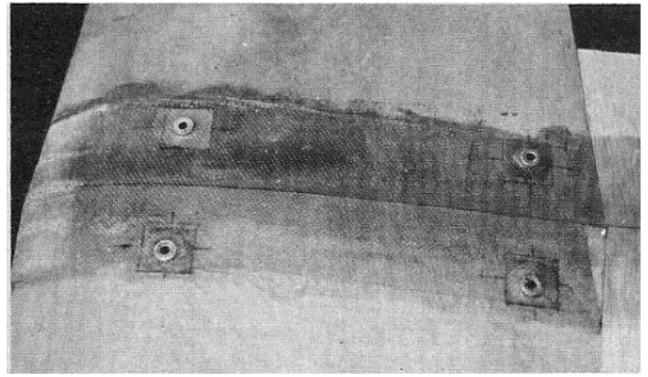
**Photo 7:** Use a square to insure the formers are square with the sides of the fuse.



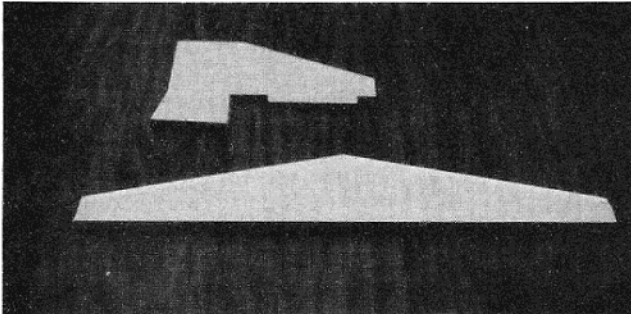
**Photo 8:** The best method of holding down the top sheet while the glue dries is to use pieces of 3/4" pine approximately 3" x 12" laid across the top and tightly rubberbanded around the bottom.



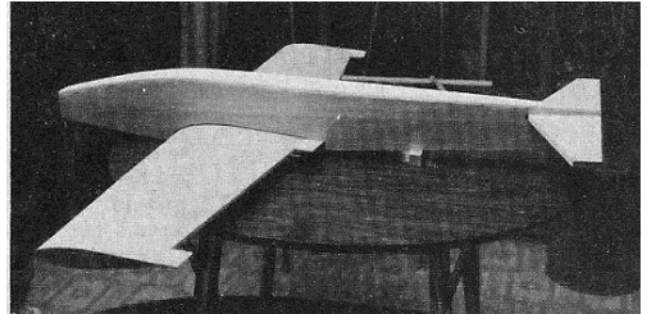
**Photo 9:** . . . it is important to cock the engine at about a 15 degree angle to get the fuel intake on the engine at the same level as the pickup on the fuel tank.



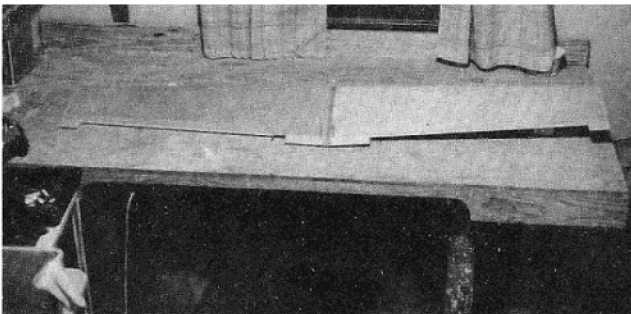
**Photo 13:** Put the second strip of glass cloth over #10 thrust washers.



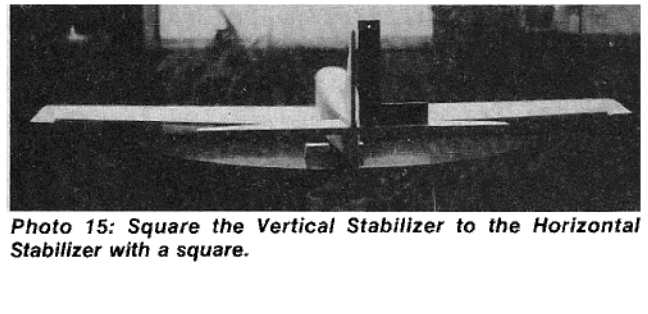
**Photo 10:** Completed rudder and elevator before sanding.



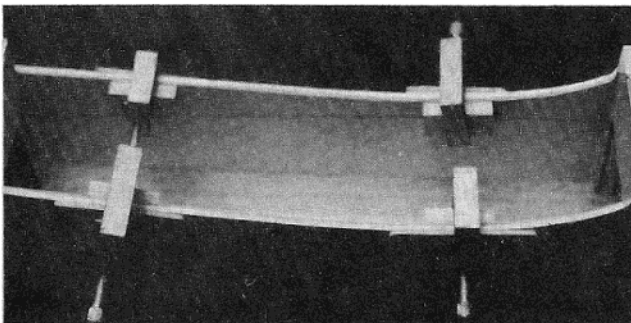
**Photo 14:** Be sure the wing, stab and fuse centerlines are parallel to the table.



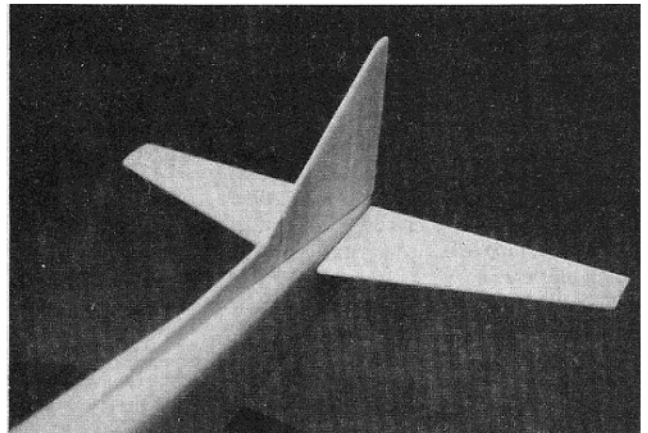
**Photo 11:** . . . join the two halves. Do not fiberglass the center at this time.



**Photo 15:** Square the Vertical Stabilizer to the Horizontal Stabilizer with a square.



**Photo 12:** . . . glue the maple hardwood blocks on the fuse sides for the wing bolts.



**Photo 16:** Rudder and stab in place.

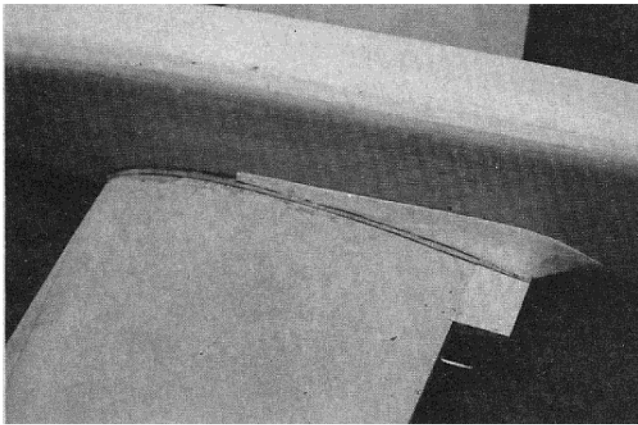
bottom sheet.

At this point you now have a square box. Don't be in a hurry to start planing and shaping just yet. You will take a layer of

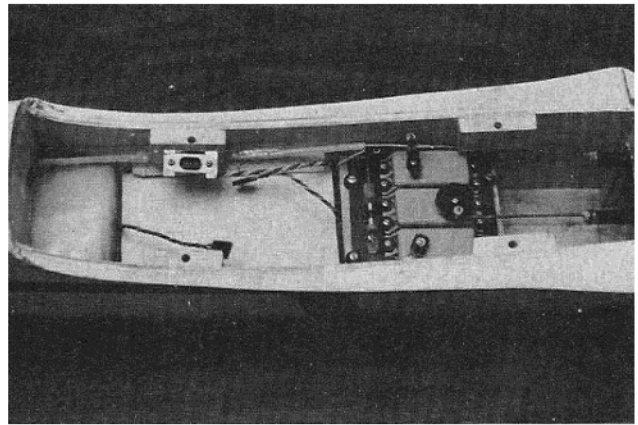
balsa off of almost the entire fuselage and the longer you wait, the more of the little bumps and nicks we all get on our planes around the shop will be taken out at that

time. This speeds up finishing and takes that much less of that heavy filler to prep for finishing.

You should now mount your engine and



**Photo 17:** Glue 1/64" plywood base to wing saddle, then wood fillet over it. Finish with glass resin and micro-balloons.



**Photo 18:** More than adequate room for equipment installation.

do the fitting on your spinner. You'll notice that on the plan the engine is cocked at about a 15 degree angle. This is important to get the fuel intake on the engine at the same level as the pick-up on the fuel tank (Photo 9).

The last thing I do, while I still have a nice flat surface to work on, is mark a centerline on the top sheet for my rudder. At this point, set the fuselage aside in a place where it won't be bumped or knocked around.

#### **Vertical Stabilizer:**

The entire rudder can be made from one sheet of 3/8" x 4" x 48" balsa. Butt join pieces of 3/8" and lay out the shape of the rudder. Cut this out and mark a centerline around the edge of the entire rudder. Plane and sand the rudder to the shape shown on the plan. After all shaping is done, you can cut the rudder away from the vertical stabilizer.

#### **Horizontal Stabilizer:**

The stab is conventional built-up construction. Start by laying out a sheet of 3/32" x 6" x 36" balsa to the shape of the stab. Build the framework over it as shown on plans. Use a piece of scrap 1/32" plywood to shim the leading edge as the overall thickness of the stab is 9/16" and the leading edge is made from 1/2" x 1/2". After all of this has dried, put on the top sheet. Sand the leading edge round as shown on the plan. Do not round the tips at this time as you will do that after you make and fit elevators (Photo 10).

For the elevators, you need a sheet of 1/2" x 2" x 24" balsa. I normally do my tapering and rounding to the trailing edge before cutting out the center as it seems to help in getting them to come out identical. After the shaping is done and the surfaces are cut out, you can shape and round the tips of the horizontal stab and the elevators simultaneously.

#### **Wing:**

After cutting your foam cores from the templates shown on the plans, glue a 1/2" x 1/2" balsa edge to them.

I won't delve deeply into landing gear installation. I prefer, as the plan shows, the horseshoe system using 3/16" plywood

with 1" dowels drilled and glued into the wing. This system can be easily adapted to most any of the popular brands of retracts and has worked quite well for me. If you wish to use conventional fixed gear, I suggest the old 3/4" x 3/8" x 6" maple block method.

Sand the entire wing lightly with 400 grit sandpaper to remove any ridges made by the hot wire cutter. Brush thoroughly or vacuum to remove all foam dust.

Now you are ready to apply the skin to the wing. I use 1/64" plywood for a number of reasons. (1) It is very little, if any, heavier than balsa. (2) It can be purchased in sheets large enough to cover an entire wing without any seams. (3) What little weight difference there might be between it and balsa is more than made up for in the finish saved. (4) The time savings accrued by not having to join balsa and butt fit to a leading edge, since when using plywood you wrap the entire leading edge.

Rough cut the plywood to the size required and apply a thin coat of Southern's Sorgham to the wing and the plywood.

Let the Sorgham dry completely, a minimum of 45 to 60 minutes. At this time you should apply a small amount of water to the outside surface of the plywood to make wrapping the leading edge a little easier. The best way I've found to apply the sheeting is to lay the sheeting down flat on a table and line up the rear edge with the trailing edge of the wing. Press on the top of the wing with your hands and roll it to the thickest part of the wing. **Caution:** Southern's Sorgham works well for this but be careful lining things up before touching the wing to the skin --- once you touch the two parts there is no turning back because they are stuck! Now put one hand under the wing while keeping pressure on top with the other hand and roll the plywood to the leading edge working to the center and the tip of the wing from the middle. Pull the sheeting over the leading edge being careful to keep the sheeting pulled tight. After pulling the sheeting down to the root, again lay the wing flat on your table and roll it back to the trailing edge.

You now need to make the torque rods for the ailerons. Make these from 3/32" music wire inside of 1/8" brass tubing.

Install the torque rods into the 3/8" x 1 1/2" trailing edge stock. Be sure to recess these completely into the trailing edge stock because the front edge will make your hinge line.

Now glue the trailing edge stock to the rear edge of your wing. Your aileron should not be cut away at this point. Apply glue to the center and the tip that will remain a permanent part of the wing and just-tack the aileron in two or three places. The reason for this is so the trailing edge of your wing will be completely centered when you're finished.

When this has dried, check to see what kind of fit your ailerons have at the hinge line. If the leading edge of the aileron is thicker than the trailing edge of the wing, sand it before you cut the aileron loose.

After you've cut the ailerons away from the wing, install the tip blocks. You'll notice the plan calls for 1/4" thick tips. There is no good reason to use anything thicker because the tip blocks serve no real function other than aesthetics and the extra weight you save there can be put to good use in other places. Sand the entire wing with 220 sandpaper and then join the two halves. Do not fiberglass the center section at this time (Photo 11).

#### **Assembly:**

You'll notice that the plan calls for using four bolts rather than two bolts and two dowels, which seems to be popular. This is because past experience has shown that over a period of time the dowels will wear notches in themselves and the holes in the former will begin to elongate. This causes the decalage of the wing to be constantly changing. This will cause continual changes in the flight characteristics of the airplane.

In the following text I will describe a way of making the difficult chore of attempting to locate four wing bolts accurately almost foolproof.

Check the wing saddle on the fuselage to insure it fits the contour of the wing tightly. Now, glue the 3/8" x 3/4" x 1 1/2" maple

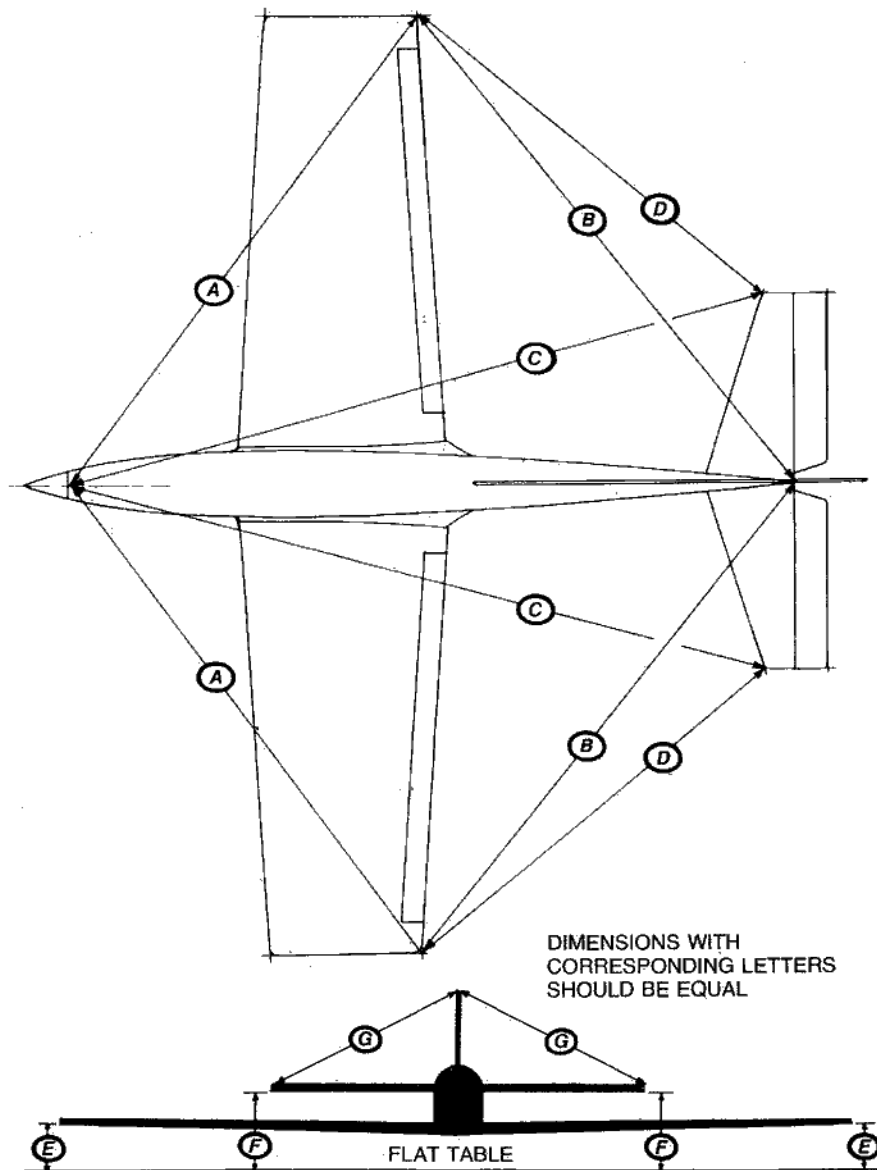
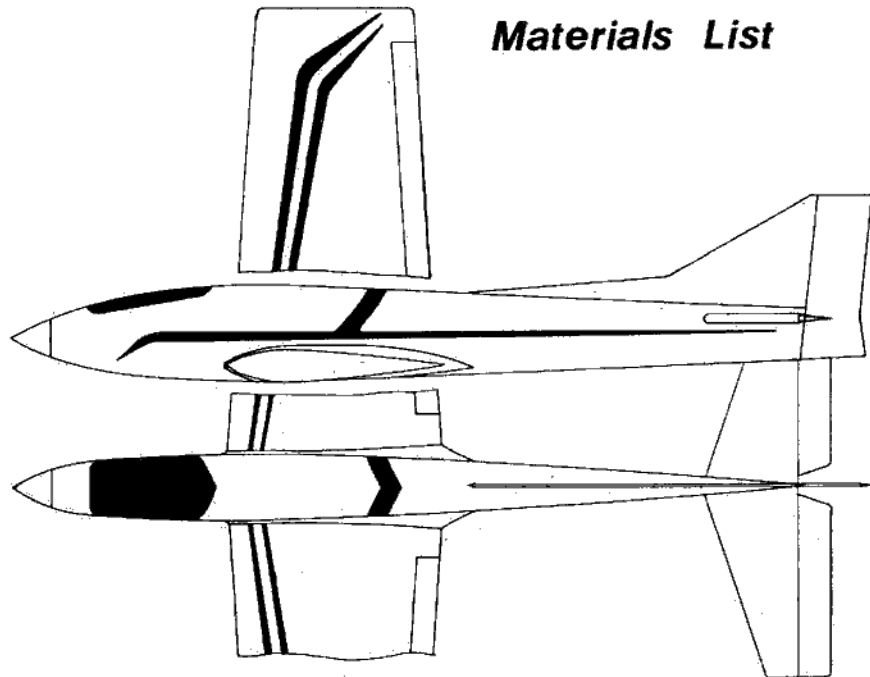


FIGURE 1

## Materials List



hardwood blocks on the fuselage sides for the wing bolts (Photo 12).

Draw lines on the bottom of the wing at the approximate center of the maple blocks. Cut a 1" x 1" square in the top and bottom of the wing and remove the foam at these points.

Lay the fuselage upside down on a flat table. Carefully measure from the centerline of the side at both the tail and nose. Block the tail up until the measurements are exactly even. Now lay the wing in the saddle. Measure the distance from the leading edge to the table then the distance from the trailing edge to the table. These measurements should be equal. If they are not, sand the wing saddle on the fuselage until they are equal.

Measure from the wingtip to the centerline at the tail of the fuselage. Adjust the wing location until this measurement is the same from the leading edge of the tip to the center of the nose.

It will take some time to get it located just right, but it is time well spent. I think that insuring the wing, stabilizer and rudder are square and plum is as important as building all of these straight and true. (See Figure 1).

After the wing is located to your satisfaction, reach through the hole where the 1" x 1" balsa blocks go with a felt tip pen. Mark where the center of the hardwood blocks are on the foam inside then transfer it to the top of the wing.

Install the 1" x 1" square balsa blocks for the wing bolts but do not disturb the marks you just put on top.

After the blocks have dried and you've trimmed them, mark the centerlines for the bolts on the top side of the wing.

With a drill press, or very carefully with a hand drill, drill the holes you marked as straight as you can through the wing

### Fuselage

- 2 — 1/8" x 6" x 48" balsa
- 1 — 1/16" x 12" x 24" plywood
- 3 — 3/4" x 36" triangle stock
- 5 — 1/2" x 36" triangle stock
- 1 — 3/8" x 36" triangle stock
- 1 — 1/32" x 4" x 24" plywood
- 1 — 1/4" x 4" x 48" balsa
- 1 — 1/4" x 4" x 36" balsa
- 1 — 1/8" x 6" x 12" plywood
- 1 — 1/16" x 6" x 12" plywood
- 1 — 3/16" x 6" x 12" plywood
- 2 — 1" x 1" x 12" balsa

### Wing

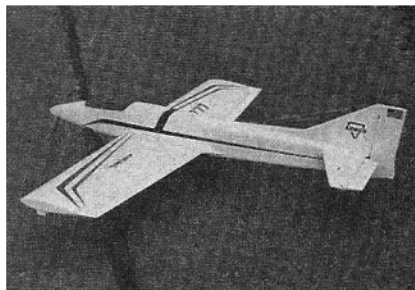
- Wing cores — styrofoam
- 2 — 1/2" x 1/2" x 36", trailing edge
- 2 — 3/8" x 1 1/2" trailing edge stock
- 2 — Aileron torque rods and tubing
- 2 — 1/64" x 24" x 36" plywood

### Vertical Stabilizer

- 1 — 3/8" x 4" x 48" balsa

### Horizontal Stabilizer

- 2 — 3/32" x 6" x 36" balsa
- 1 — 1/2" x 1/2" x 36" balsa
- 1 — 3/8" x 3/8" x 36" balsa
- 1 — 1/2" x 2" x 36" balsa



perpendicular to the maple blocks on the fuselage with a 9/64" drill bit. Replace the wing in the saddle where you located it earlier. I always check my measurements again just to be sure. Take a hand drill with a 9/64" bit and, using the holes you just drilled in the wing as a guide, drill holes approximately 1/8" deep in the hardwood blocks. Remove the wing again and check the location of the holes. If they are fairly well centered, replace the wing and drill the holes the rest of the way through the hardwood blocks. You can now tap the hardwood with a 10-24 tap. Put the wing in the same position it was in when the original holes were drilled on the drill press. Enlarge these holes to 13/64". The wing should now fit the fuselage exactly as you laid it out.

Now you can fiberglass the center section of the wing. I've seen quite a few airplanes come apart in the air because of wings folding in the center section. To keep this from happening to me I double wrap the center section with 6 oz. glass cloth. First put a strip about 1" wide around the wing. After it is dried and sanded, put another 4" wide strip over the first one. Before putting on the second strip, epoxy #10 flat washers over the holes as a thrust bearing for the wing bolts. After applying the second layer of glass cloth they will stay in place (Photo 13).

Cut the slot in the top sheet of the fuselage for the rudder to set in.

Before mounting the rudder or elevator the fuselage should be planed and sanded to the shape shown on the plans.

After this is done put the wing on the fuselage. Set it up square to a table as you did to mount the wing. In addition to the fuselage centerline being parallel, each of the wing tips should also be the same distance from the table. Now slip the stab into its saddle and measure to be sure the centerline of the leading and trailing edges are an equal distance from the table (Photo 14).

To align the stab, adjust the position of it until the distance from the tip of the stab to the tip of the wing on each side is equal. When these measurements are equal, measure from the tips of the stab to the top centerline at the front of the fuselage. These measurements should also be equal. It is also important to note that when the wing tips are an equal distance from the table, the

tips of the stab should also be an equal distance above the table.

If you measure the wing and stab position as I have described it, you can go ahead and glue in the stab and be sure that the wing and stab are square with each other as well as to the fuselage.

After the stab is in place, the vertical stabilizer can be mounted. The thing to watch here is to make sure it is on the centerline you drew earlier and that it is exactly perpendicular to the elevator. You can do this by setting a tri-square on the stab and eyeballing it. Or, if you don't trust your eyes, you can measure from the top of the rudder to the tip of the stab from each side until the distances are equal (Photos 15 & 16).

The wing fillets are the next thing to be installed. You're probably pondering at this point as to whether those fillets are worth the trouble it takes to make them. Believe me, they are. They do much more than just make the plane look nice where the wing intersects the fuselage. The major cause of sloppy control response in the tail and fish tailing is from turbulence kicked up around the center section of the wing where it meets the fuselage. With fillets, that turbulence can be smoothed out to a large degree and it does make a difference.

The fillets are made from a piece of 1" x 1" x 12" balsa. Cut the bottom to fit the wing and rough cut the top and side profiles as shown on the plans with a Dremel saw. After this is done it is not difficult to get the desired shape with a knife and some sandpaper.

Mount the wing on the fuselage with a scrap 1/64" plywood under the saddle. Mark a line where the side of the fuselage hits the plywood. Get the outside shape of the fillet from the top view shown on the plans. Five minute epoxy these to the fuselage while the wing is in place. When these are dry you can now epoxy the wood fillet to the fuselage and the plywood. This will leave you with approximately 1/8" to fill between the balsa fillet and the edge of the plywood and about 1/4" fillet in front of the balsa. With some glass resin and micro-balloons you can have professional looking fillets in two or three hours (Photo 17).

The fillets on the bottom of the wing are very simple. Use 1/4" scrap balsa for the sides and ends with 1/8" sheet for the bottom. Five minute epoxy this in place. Plane and sand to the contour of the fuselage, then smooth the sharp corners with resin and micro-balloons.

#### Finishing:

Sand the entire airplane thoroughly with 220 sandpaper. Fill any nicks or gouges. For large areas such as around the rudder and stab use micro-balloons and resin. For nicks and dents, DAP-Vinyl Spackling Compound works well.

Give the entire plane two coats of clear dope, sanding after coats with 320 sandpaper. Follow this with one coat of thin filler. Aero Gloss sanding sealer thinned

about 60% works well. Sand again with 320 sandpaper.

The secret to a good finish is in the sandpaper. By sanding all of the filler off, except for that in the pours of the wood, you build a nice finish and add very little weight.

Now give the whole airframe another coat of clear dope. Lightly sand with 400 sandpaper, wet. Carefully cover the entire fuselage and all control surfaces with Silron.

On the wing you should be able to apply one more thin coat of clear, sand, and be ready to paint.

After covering, apply two more coats of clear and then two more coats of filler. Again, the critical thing is sanding. Sand carefully, but sand off everything except what's in the pores between each coat.

Follow the filler with two more coats of clear and you should be ready to paint. Look the plane over carefully after sanding the final coat of clear. Your finish will be no smoother than what you have right now.

If you're satisfied with this then you're ready for color. I use acrylic lacquer. Sand with 500 sandpaper wet, between color coats. Wait about two weeks after the final painting. Sand with 600 sandpaper wet. Rub the plane out with a fine machine grade compound to a beautiful finish. There's nothing more enjoyable than having people ask if that's a glass fuselage on your new bird.

I realize there are faster ways to finish airplanes, but I have found nothing that makes a more durable, long lasting finish than this. You end up with a hard shell rather than just paint over balsa.

#### Flying:

If you're building a high performance aircraft such as this, I would assume you are experienced enough to have your own method for trimming airplanes. Also, every article written has one so I won't bore you with mine.

However, if this is your first such aircraft, I'll go along with everybody else and say, "Get somebody experienced to help the first few times." This is about as good advice as you can get. There's nothing worse than taking out that beautiful new ship with all of your blood and sweat in it and bringing it home in a basket the first day.

#### Conclusion:

If you have carefully followed these guidelines and paid close attention to your building, you now have that clean flying, straight and true aircraft it takes to win contests. But remember, the only way you can win is to give your 95%. That means many long hours of practice. Also, don't be surprised if there are a few more Tropic-Aires at the field after seeing yours perform. We currently have four in our club.

I would like to wish you the best of luck with your new Tropic-Aire. Also, don't forget how you built it, because if you're as happy with yours as I am with mine, I'm sure it won't be your last one. □