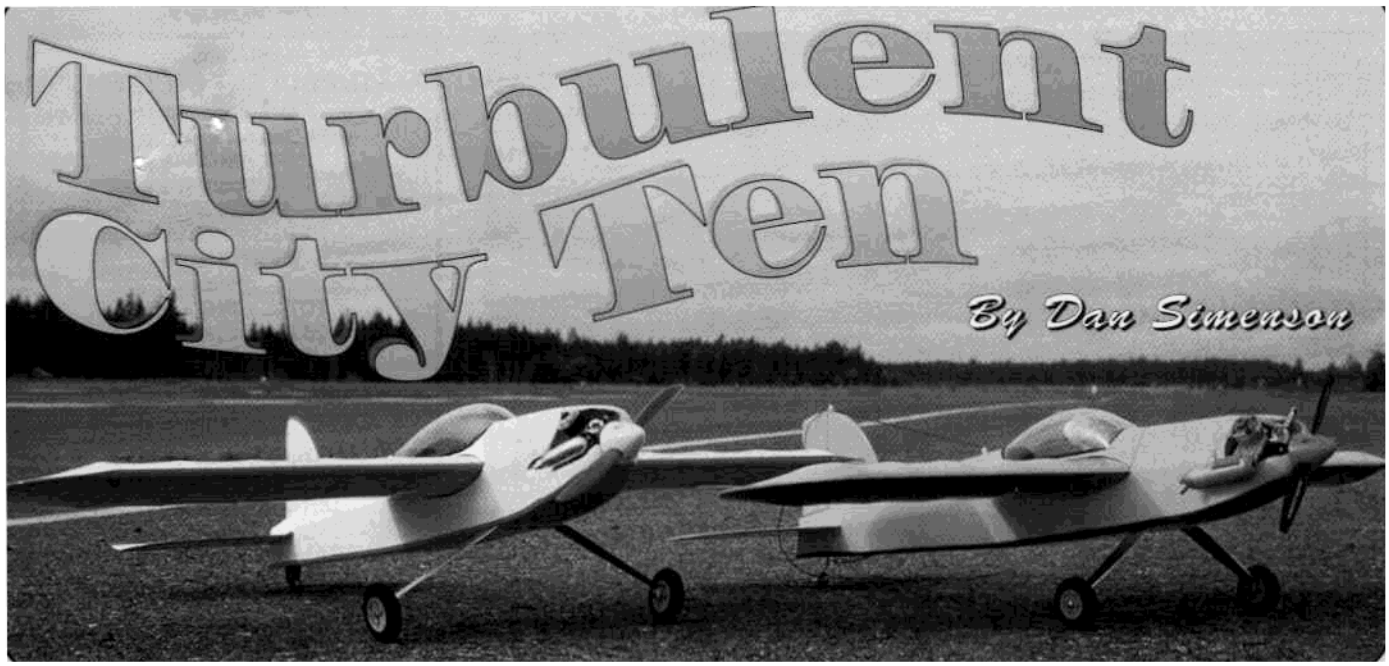


A SMALL SIZED MODEL, THAT'S BIG ON PERFORMANCE!

Have you ever sketched airplanes on the back of a placemat while relaxing in a restaurant? I had this O.S. 10 that was suddenly released from duty by a crash and there is nothing that precipitates ideas like a loose engine. One such idea that found its way onto a placemat was eventually enlarged to good thinking size and with a little work became the Turbulent City Ten. It was to be small enough to fit in a compact car without removing the wings or could be taken along to the field for a second plane. It turned out to be a good flier and is fairly fast at full throttle, but handles well. You will find it exciting to fly and though it is not recommended as a first aileron model, if you are comfortable with a .40 size sport plane you should have no trouble.

CONSTRUCTION

Wing:

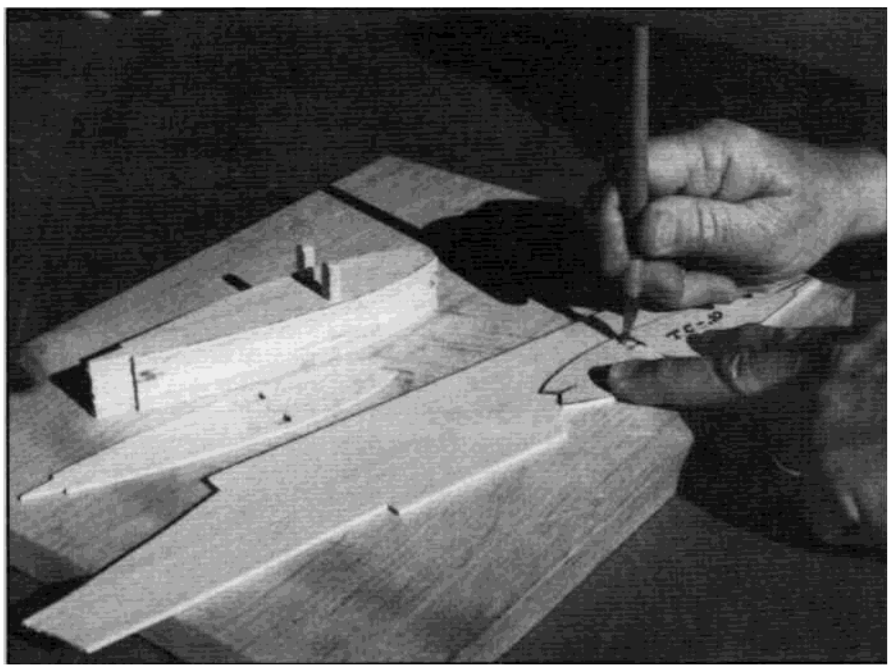
Since the wing is needed to fit the hatch/canopy assembly to the fuselage we will start with the wing. The spar holes in the ribs can best be made using a template. Formica works well as does thin aluminum. The 1/4" square spar holes can easily be cut out with a #11 X-Acto blade. As you cut out the ribs, allow about 1/32" excess of wood near the leading and trailing edges (for final sizing later). Stack the ribs on two short pieces of spar material. This will align them for sanding and trimming the leading and trailing edge notches. A final sanding of the "pack" will assure a good contour. Take the two center ribs from the stack and trim off 1/16" from both the top and bottom. These will be the R-2 ribs for the center section.

Lightly sand two lengths of 1/4" square balsa for the wing spars. Lay one on the plan and mark the rib positions with a pen. Then holding both spars in one hand, slide the two center ribs into position followed by the remaining ten. Set the assembly aside and cut two lengths of 1/4" square into 6" lengths. Pin or nail them in place over the plans to form the base of the wing building jig. Then pin one long piece across the tops of the other six where indicated to form a trailing edge support. Now cut two 3/4" wide pieces and one 5/32" wide piece from 3/32" sheet. Pin one 3/4" piece in place over the 1/4" square and then place the rib assembly over the jig. Pin the spar down and align the ribs one at a time. CA the assembly together before adding the leading edge and two remaining trailing edge pieces.

A short piece of aileron stock fills in the center section of the T.E. to strengthen the wing screw holes. The lite ply wingtips are positioned with a slight upwards slope. This qualifies as dihedral angle; however, we do it because it looks better than straight. Cut the

ABOUT THE AUTHOR

Dan is 65 years young, and has been hooked on model building ever since 1939. In that time rubber power, hand launch, towline, powered free-flight, indoor microfilm, U-control, and radio control have all interested him. Most have been and continue to be scratch designed and built. After a four year hitch in the Air Force (Korean War) as a B-29 and B-50 mechanic, he returned to college for a BS in mechanical/aeronautical engineering at U.C. Berkeley. Upon graduation he worked in the basic aero loads group at Radio Plane/Northrop until they lost their contract. He then moved up to Lockheed Sunnyvale and worked there for 28 years on various programs mostly involving dynamics, mechanical, and some aero/thermal testing. When their three children were grown and settled he and his wife Flo retired to Oak Harbor on Whidbey Island in Washington. As a member of the Whidbey Island Radio Control Society (WIRCS) he flies at the auxiliary Navy field 13 miles South of town.



Cutting and stacking the ribs.

NAME
TURBULENT CITY TEN
Designed by:
Dan Simenson
TYPE AIRCRAFT
Sport
WINGSPAN
36-1/2 Inches
WING CHORD
7-7/8 Inches
TOTAL WING AREA
263 Sq. In. (Approx.)
WING LOCATION
Mid-Fuselage
AIRFOIL
Symmetrical
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
None
OVERALL FUSELAGE LENGTH
31 Inches
RADIO COMPARTMENT SIZE
(L) 7" x (W) 2-1/2" x (H) 1-3/4"
STABILIZER SPAN
14 Inches
STABILIZER CHORD (inc. elev.)
4-1/2 Inches (Avg.)
STABILIZER AREA
64 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Mid-Fuselage
VERTICAL FIN HEIGHT
4-1/2 Inches
VERTICAL FIN WIDTH (inc. rud.)
4-1/2 Inches (Avg.)
REC. ENGINE SIZE
.09-.10 Cu. In.
FUEL TANK SIZE
4 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
C.G. (from L.E.)
2 Inches
ELEVATOR THROWS
3/8" Up — 3/8" Down
AILERON THROWS
3/16" Up — 3/16" Down
RUDDER THROWS
5/8"-3/4" Left — 5/8"-3/4" Right
SIDETHRUST
0 Degrees
DOWNTHRUST/UPTHRUST
0 Degrees
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply, Basswood
Wing ..... Balsa, Ply
Empennage ..... Balsa
Wt. Ready To Fly .. 31 Oz. (1 Lb. 15 Oz.)
Wing Loading ..... 17 Oz./Sq. Ft.

upper spar at the outer ribs and trim the short piece to slope down to the ply tip. Trim it so the spar will not contact the covering. The lower spar can be done after lifting from the jig. Add the aileron servo mounting rails and the 1/16" sheet webbing tip to tip. Clamp the T.E. together against the ply tip and glue. Later it will be sanded so the wood does not contact the covering. The center section sheeting is then added and the aileron servo access hole is cut out over the servo location. With a plane or sanding block, shape the leading edge to the section shown.

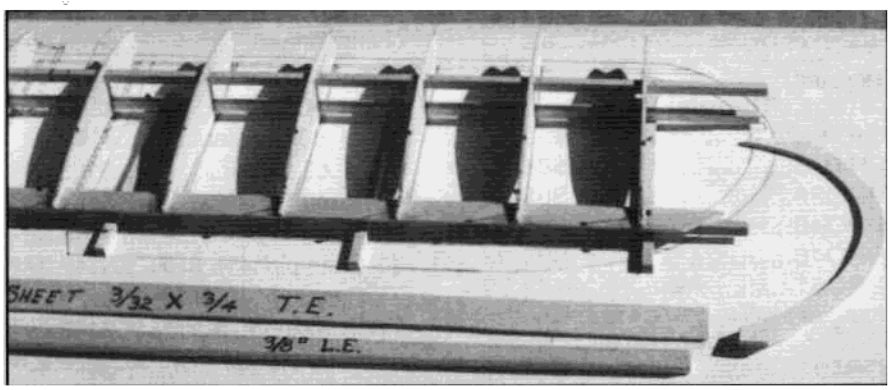
The ailerons are cut and shaped from 1" aileron stock. Bend the 1/16" music wire torque rods as shown with a short piece of tubing or inner NyRod on each one to act as a bearing. Later at assembly, the bearing can be secured to the wing, and the torque rod to the aileron by a few turns of thread and CA.

Aileron hinges as well as rudder and elevator hinges are a matter of personal choice. On the first three models, I used Kwik Hinges, and two different methods of using covering film. All three were satisfactory but I liked the covering film as that sealed the hinge gap without an additional step.

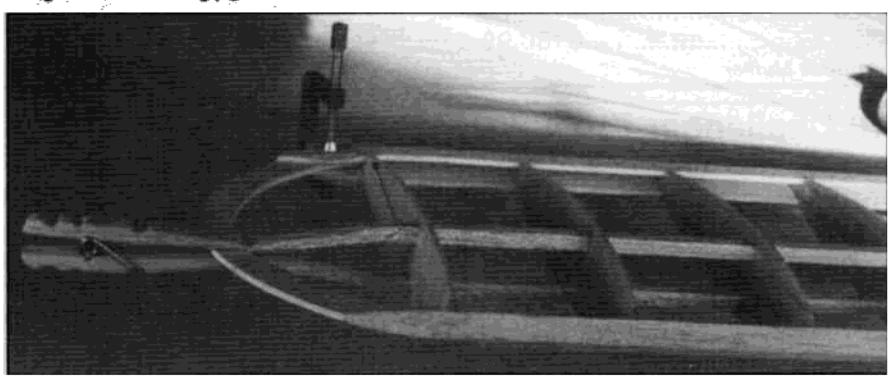
Fuselage:

Start by cutting out the plywood frames and doublers. I find it helpful to mark center-

Sliding the ribs onto the spars.



Wing on the building jig.



Detail of spars at tip and T.E. clamp.

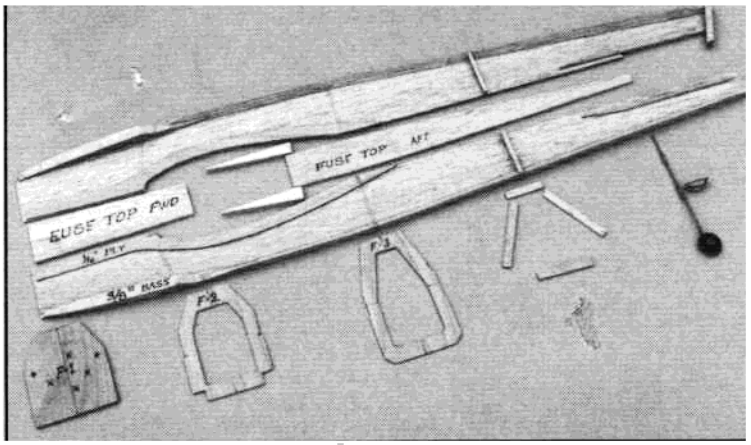
lines on the frames after trimming them to final shape. Cut out the fuselage sides and pin them together for trimming to ensure that they are identical. While still together, mark the frame positions on the top and bottom edges. Separate them and connect the edge marks on the inside surface only for a guide during frame placement. Now cut out and add the plywood wing saddle doublers. The basswood landing gear supports can be shaped and glued in place. Note that the 3/8" square pieces are tapered both ways to reduce weight. A disk sander makes short work of this but a knife will do the job. Cut a 1/4" square tail post and glue it to one side at this time. Make it in one piece for now, you will cut the stab notch after the fuselage top is sheeted. Add the triangle stock to the lower edges from the basswood chines to the tail post. Note the short overlap with the chines. A piece of 3/32" x 1/4" balsa is added to each side at F-4, later to become a complete frame. The 3/32" x 1/4" stab support doublers complete the side assemblies.

Score the forward surface of F-3 where shown but do not bend it yet. Drill the holes in the fire wall and add the blind nuts. The 45° engine position is optional but was selected to put the exhaust under the wing, and to lower the throttle spraybar to the correct level relative to the fuel tank. If you plan to use the Cox RC 09 engine, make the cut-out on the right fuselage side. A 1/2" x 3/4" x 1-1/2" balsa block should be added inside to back up the cut-out. Don't forget the cut-out on the fire wall to clear the muffler.

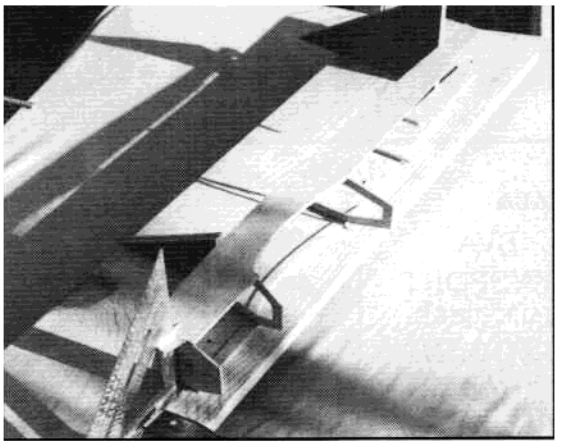
That done, lay one side assembly down on a flat work surface. Epoxy F1, F2, and F3 in place using squares or blocks of wood to hold them true. When the glue is cured, epoxy the other side to the assembly, being sure that they are parallel. Wait for a full cure before proceeding. Next, with a weight on the forward half of the fuselage to hold it down, bring the aft ends together to determine the angle required on the tail post for a good fit. The triangle stock will need a trim also to fit at the aft end. When satisfied, cut a scrap of 1/16" balsa sheet 1-1/4" x 2" wide. Place it under the tail post of one side and push the other side down to meet it for a trial fitting. You may have to adjust the 1-1/4" dimension to ensure that the centerline of the tail post is exactly where it should be. Once done, glue the aft ends together. Cut two 3/32" x 1/4" sticks to fit as crosspieces at F4 and glue in place. As to their length, just let

BILL OF MATERIALS

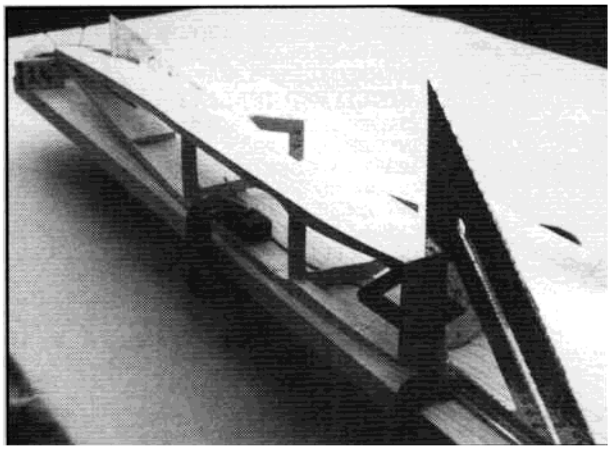
3 — 1/16" x 3" x 36" sheet balsa
4 — 3/32" x 3" x 36" sheet balsa
1 — 1/8" x 3" x 36" sheet balsa
1 — 3/16" x 4" x 36" sheet balsa
5 — 1/4" sq. x 36" balsa sticks
1 — 3/8" sq. x 36" balsa stick
1 — 3/32" x 1/4" x 36" balsa stick
(can be cut from 3/32" sheet)
1 — 3/32" x 5/16" x 36" balsa stick
(can be cut from 3/32" sheet)
2 — 3/32" x 3/4" x 36" balsa sticks
(can be cut from 3/32" sheet)
2 — 1/4" x 36" triangular stock
1 — 1" x 1/4" x 36" aileron stock
1 — 4" x 10" 1/32" birch ply
1 — 14" x 3-1/2" 1/16" birch ply
1 — 3" x 3-1/2" 1/8" birch ply
1 — 6" x 9" 1/8" Lite ply
2 — 3/8" sq. x 7" basswood,
or other hard wood
1 — 1/4" sq. x 12" basswood,
or other hard wood
1 — 1/4" x 3/8" x 6" basswood,
or other hard wood
1 — NyRod, 36" or equivalent
pushrod material w/clevises
4 — 2-56 or 4-40 blind nuts (your choice)
1 — 13.5" x 1" x .063, 6061-T6 Aluminum sheet
or Sig tapered flat blank #GB-004
for landing gear
2 — 6-32 x 1" socket head machine screws
2 — 6-32 elastic stop nuts
2 — 6-32 nuts, plain
2 — #6 steel washers
1 — #2 x 1/2" sheet metal screw, for hatch
1 — 1/16" dia. x 36" music wire
1 — 3/4" dia. tail wheel
1 — Paper clip, 2" size (.050 wire)
2 — #8-32 x 3/4" nylon machine screws
(wing retainers)
2 — #8-32 x 1/2" nylon machine screws
(L.G. retainers)
1 — Canopy, Sig #53286, WC-809
or alternate: Sig #CS-011
1 — Roll of covering,
or equivalent in chosen colors
2 — Wheels, Dave Brown Lectra Lite, 2" dia.
1 — Fuel tank, Sullivan S-2 or equivalent 2 oz.
1 — Spinner, 1-1/2" dia.
10" — Fuel line
12 — Kwik Hinges or use covering film
2" — 5/32" O.D. brass tubing
1 set — Aileron connectors or ball and socket set



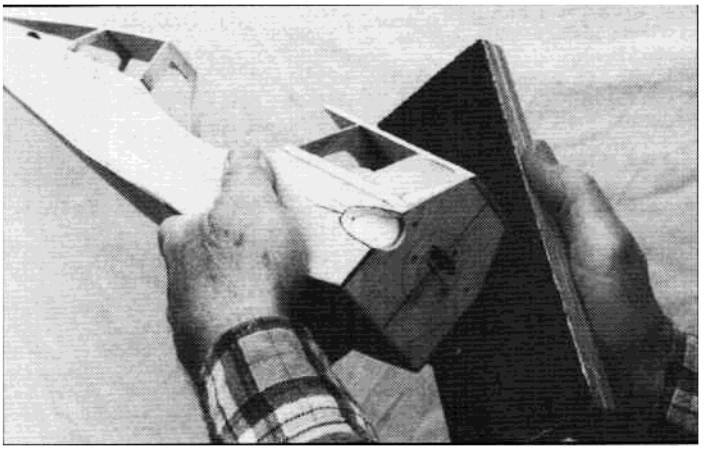
Fuselage parts ready for assembly.



Checking fuselage assembly for square.



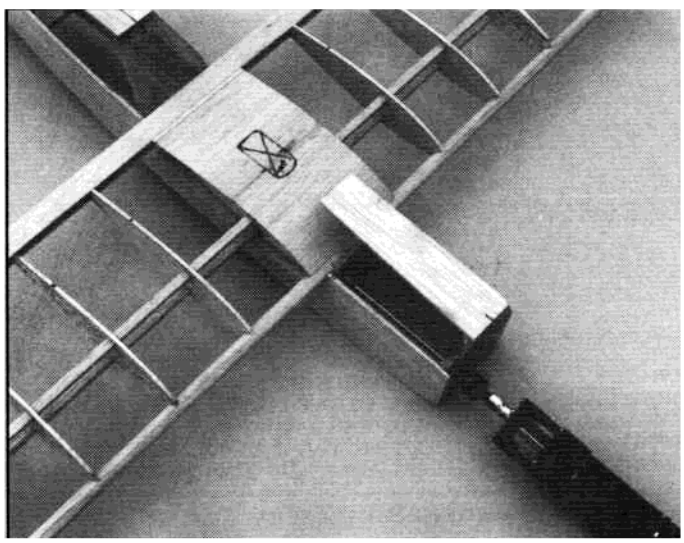
Second fuselage side in place.



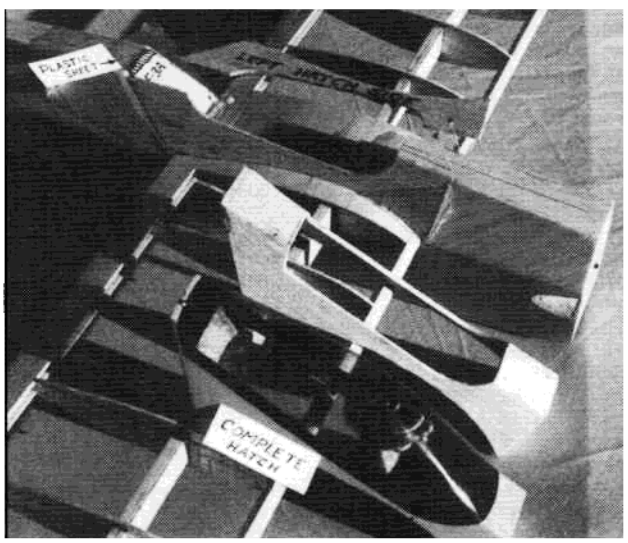
Sanding the bevel prior to sheeting.

the sides take their natural curve. Push the top of F3 back now so it cracks at the score. CA the joint and prop it at the correct angle. Cut out the 1/8" sheet fuselage top pieces now and glue in place. Do not cut off the forward piece at the hatch line yet. That will be done when the hatch is completed. The Rx tray and tray back should be put in place now as well as the 1/4" square servo tray rails. The frame at F3 can be completed by adding the top crosspiece and the two sloping side pieces. Add the 1/4" triangle stock to the backside of the fire wall with epoxy. Installation of the two basswood wing anchor bolt blocks to the inside of the wing saddle doublers allows us to fit the wing.

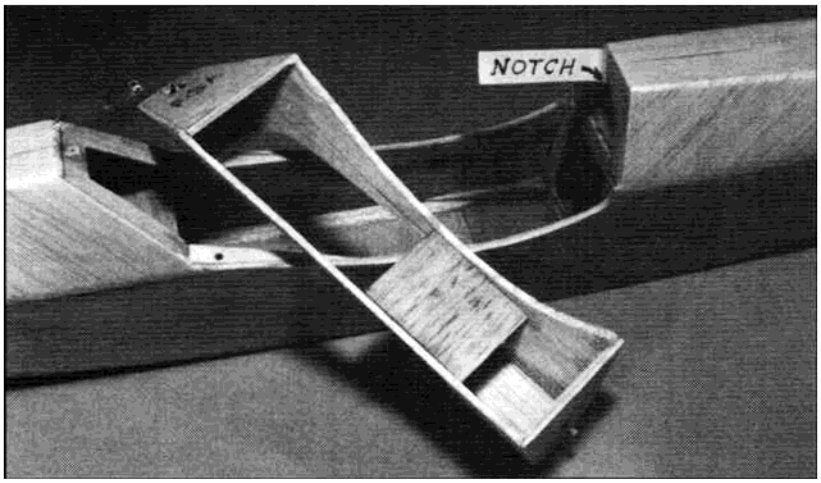
Trial fit the wing. Align it to the fuselage in both top and front views. With the fuselage sitting on a flat surface, the wings should be level. Also, a square held against the forward part of the fuselage should line up with the wing spar. With a pencil, lightly mark the wing sheeting at the sides of the fuselage so you can replace it in the same position. With a ruler, locate the screw hole position. Drill down (perpendicular to the slope of the wing trailing edge) through the wing and anchor blocks with a small drill (1/16" or less) for a pilot hole. Making sure the wing doesn't shift, drill the second hole. Follow up with a 1/8" drill. Run an 8-32 tap through the blocks, harden the holes with thin CA and run the tap through again. While waiting for the CA to cure, enlarge the wing holes to 5/32". Now mount the wing and snug the bolts. With a sharp pencil, mark the wing dowel hole locations opposite the center of the airfoil at the leading edges on F2. Remove the wing and, with a small drill, make a pilot hole on each side of F2. Reinstall the wing, and with a drill at least 5 inches long, come



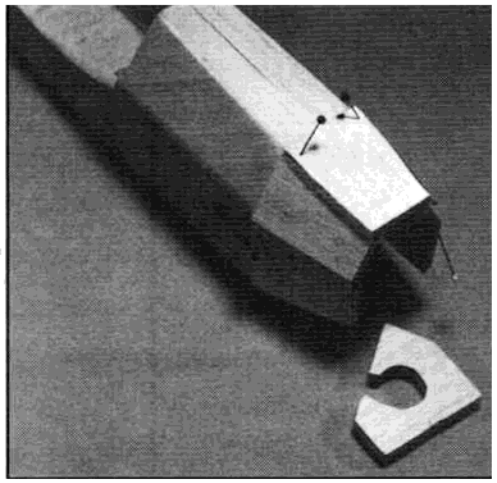
Match drill wing dowel holes.



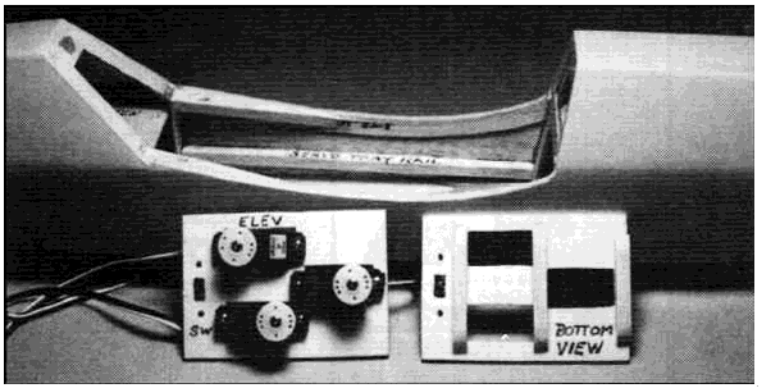
Pin hatch parts in place and partially complete the hatch.



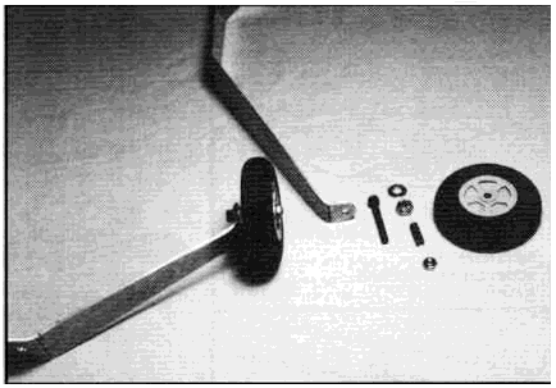
Hatch details. Note dowel and retaining screw.



Cowl cheeks pinned in place.



Servo rails and tray.



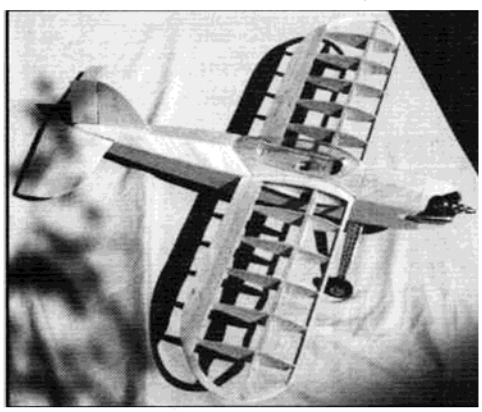
Landing gear parts.

through the fire wall, F2, and into the wing L.E. Follow up with a 3/16" drill. Make up two dowels long enough so that they will extend into the webbing. Don't glue them until after the wing is covered. The holes in the fire wall can be plugged later.

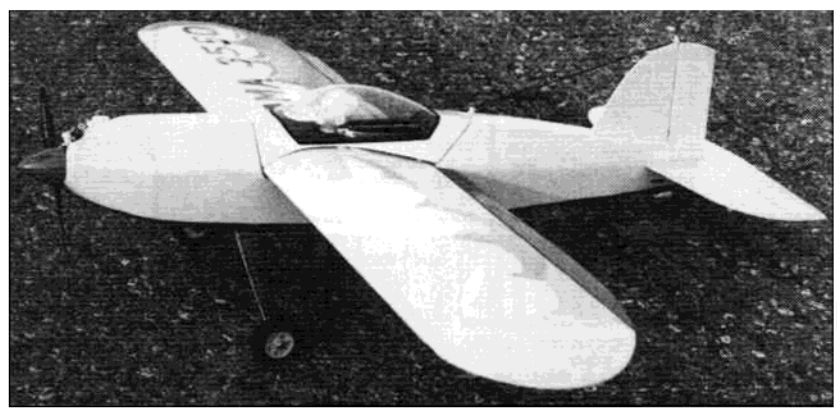
The fuel tank is added while there is access to the forward compartment. An easy mounting system is to cut two pieces of foam about 3/4" in thickness to the shape of the fire wall. Cut a hole in each one to fit the shape of the tank. Slip the tank into them and place the whole thing in position behind the fire wall. One foam "bulkhead" holds each end of the tank. The brass fuel and vent tubes should protrude from the hole in the fire wall. When all is positioned correctly, a few tics of silicone will secure the tank in the foam and CA will keep the foam from shifting. Silicone makes a weak bond that can be broken if the tank must be removed for repairs later. Silicone also makes a good seal around the fuel lines coming through the fire wall. Plug the fuel lines so sanding dust doesn't get into them.

With a large flat sanding block (I use a 3" x 9" block with 100 grit for this job) bevel the top edges of the fuselage sides and the outer edges of the top pieces to the angle of the frames. Omit the edge under the stab slot. The diagonal sheeting can be cut and glued in place now and trimmed. Take care in the area of the stab slot as the sheeting is unsupported. With a straightedge, mark the sheeting and cut the 3/16" stab slot.

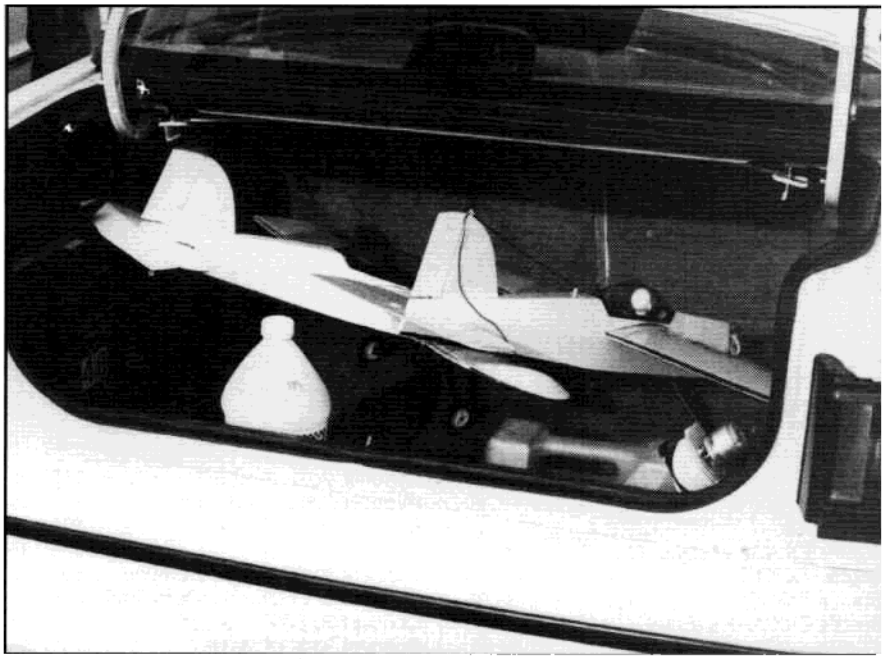
Cut out the cowl pieces. Note that C4 is made from two pieces with the grain at right angles. The easiest way to do this is to CA two pieces together, then cut it out once. Sand a bevel on the back edges of the two C1's to get the angle shown in the top view. Glue in place with the offset shown. The C2's are beveled on two edges to get a good fit. After trimming the top edges of the C2's, the top, C3, is put in place. With the sanding block, dress the front edges of the cowl and glue C4 in place. When cured, the bottom edges of the cowl can be dressed to a smooth curve to accept the plywood bottom. Cut a piece of 1/32" ply 2-7/8" x 9" long. Glue it to the bottom from the front edge of C4 back as far as it will go. Add the two pieces of 1/4" triangle stock to the inside of the cowl at the bottom. The cowl is ready for shaping with the sanding block. Rough shape the outside of the cowl and then pencil in the engine cut-outs. When you have made the cut-outs, make a trial fitting with the engine. Note that for the Cox engine, the parts C1, C2, and C3 are made 1/8" shorter



Complete, ready to cover.



Completed model, ready to fly.



Two assembled models will fit in the trunk of a compact car with room left over for gear.

and a 1/4" thick plywood spacer is put behind the engine mounts. A small drain hole in the bottom of the cowl is a good idea. At this point the fuselage bottom cross planking can be put on back to within 2-1/2" of the aft end. Cut the 1/4" square basswood crosspiece that supports the tail wheel and epoxy it in place. Drill a 5/32" hole up through the center at the approximate angle of the rudder hinge line. No fear, the hole is a loose fit for the inner NyRod bearing and will be set in place with epoxy at rudder installation. Cut a piece of 1/32" ply 2-1/2" long and roughly to shape, mark the location of the hole and glue it in place. When dry complete the bearing hole. With a ruler, mark and cut out the vertical fin slot in the fuselage top.

Hatch/Canopy:

Cut F2A, F3A, two F5's, and F6 from soft 1/8" sheet balsa. Mount the wing on the fuselage. Pin F2A and F3A in place with a piece of wax paper between them and their mating frames. Trial fit the side pieces (F5's). You will have to sand the edges to get the right bevel. Then glue F2A to the forward fuselage top (the wax paper keeps it from bonding to F2) and glue the sides on. Trim the aft top edges and glue on F6. The F5 surfaces should be flush with the diagonal sheeting. When dry, remove the hatch by sawing through the fuselage top between F2 and F2A with a razor saw. Now add the pilot support. A small piece of basswood 1/4" square is epoxied to F3 to accept a hatch retaining screw. The block should be drilled to prevent splitting. A small recess is cut in F3A to clear the block. A small piece of dowel is mounted in a hole in F2A to hold the front down. Locate the dowel just under the edge of the cut-out in F2.

Next, the canopy is fitted. Unit #1 had a canopy "heat shrunk" from the material in a 2-liter pop bottle. This requires the carving of a plug in the desired shape. If you are up to trying that method or the more conventional way of forming, have at it. Units #2 and #3 used readily available (and inexpensive) canopies from the Sig catalog. The Magnum powered unit (#2), looks "sporty" with the Sig #WC-809 (shown on the plans), while the Cox powered model (#3) looks more "racy" with Sig #CS-011. For either canopy, trim it to shape, press it down on the hatch assembly, particularly at the aft end, and heat very gently with a hot air gun. Work very slowly and, as the back edges start to soften, it will spread and take the shape of hatch top. Both canopies are a bit narrow at the aft end as they come, but can be easily made to fit good by this method. You may have some other left-over canopy sitting on the shelf that will work just as good. RC-56 glue is recommended for canopy mounting.

Empennage:

The tail surfaces are all cut from 3/16" soft balsa sheet. The shaping of the elevators and rudder can be done quickly with a razor plane, but a sanding block will do it also. The leading edges are rounded rather than sharp so the soft balsa is less vulnerable to damage. At the hinge lines the stab and fin are square, while the elevator and rudder are rounded. A small piece of inner NyRod is glued in a drilled hole in the leading edge of the rudder to accept the end of the torque rod. Hinging can either be the Kwik, Easy, or covering film kind. But do seal the gaps whichever type you use. I prefer to cover all parts before mounting on the fuselage. The covering film makes a poor gluing surface so mount the bare stabilizer and fin on the fuselage, and with a soft pencil mark the surfaces on both sides at the fuselage. When you cover these parts, cover only up to the line, leaving all the gluing surfaces bare.

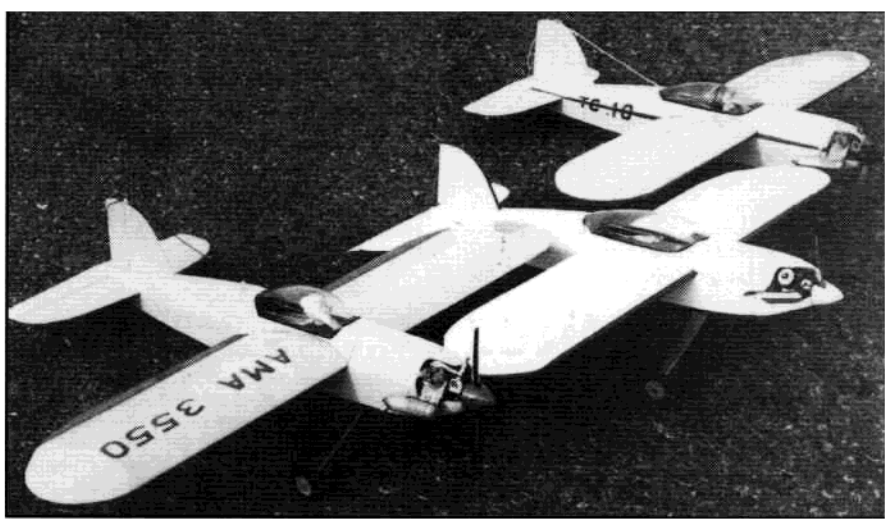
Covering:

In preparation for covering, the whole structure should be thoroughly sanded with 220 grit paper. Any nicks or voids can now be filled with your favorite brand of lite spackle. When dry, resand those areas. A final polishing with 300 or 400 grit improves the surface. Brush off all the dust and then vacuum the whole plane. The three models built were covered with a combination of Black Baron, Solarkote, and Flite Kote, so take your choice. After covering, coat the fire wall, the inside of the cowling, and the edges of the covering (on the cowling) with 5-minute epoxy as a sealer.

Tail Wheel Assembly:

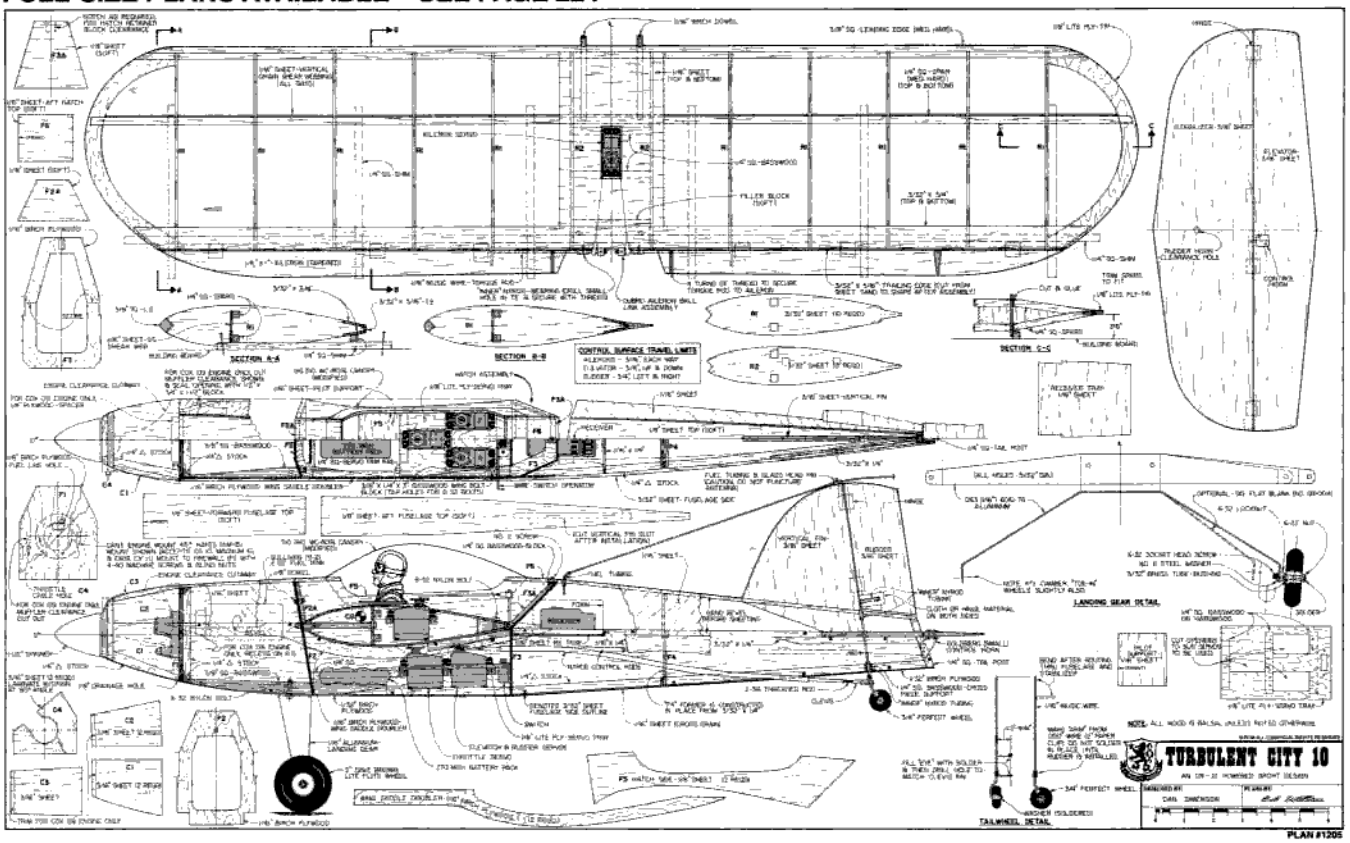
Bend the tail wheel axle and torque rod from 1/16" music wire to the shape shown. Do not bend the top over yet. The 3/4" dia. wheel can be put on and retained with a small washer or a single turn of copper wire (like a washer) soldered in place. The steering arm is bent from a 2" size paper clip. It is easy to shape yet strong enough to do the job. (Trying to use music wire for the arm is difficult because of the tight bends.) Bend the eye first, then holding it with a pair of pliers, wrap the wire tightly around the music wire torque rod three or four turns. The arm from the center of the eye to the torque rod should be about 1/2" to 9/16". With a soldering iron, fill the eye with solder. Then drill a hole in the solder to accept your rudder pushrod clevis. Do not solder the arm to the rod yet.

The empennage can now be mounted. Fit the vertical fin and stab in place and check for alignment. This is best done with the wing on and fuselage resting on a flat surface. Make adjustments if needed and then glue in place.



Three completed models, all with different engines.

FULL-SIZE PLANS AVAILABLE – SEE PAGE 224



Make sure the vertical fin trailing edge is lined up with the bearing hole on the bottom. Slide the steering arm and the lower NyRod bearing onto the torque rod, then push the assembly up through the hole and out the top. Check to see that the rod does not rub in the clearance hole in the stab. Slip the upper bearing on the rod where it comes out the top. You may have to cut a small piece of covering away and make a depression on the aft edge of the fin to fit the bearing. Now make the 90° bend in the rod with long nose pliers, taking care that the bend is in plane with the wheel. Attach the rudder by its hinges and check for smooth action. If okay, CA the upper bearing in place and epoxy or thick CA the lower one. With the rudder held in neutral, slide the steering arm up to the bearing and solder it to the rod while holding it at 90° to the plane of the rudder. Install the elevator and the control horn and the task is done.

Landing Gear:

Since we often have a crosswind where we fly, an extra wide tread landing gear was used. It seemed to work good but the second unit had the "standard" tread and worked all right too, so take your pick. A flat blank available from the Sig catalog or your local hobby shop will make the "standard" or you can cut either from a piece of 1/16" 6061-T6 aluminum. While you are at the drill press drilling the blank, chuck a piece of 1/4" dowel in the drill press and at slow rpm put a watch case finish on the aluminum. To prepare the end of the dowel, just bring it down on a piece of sandpaper to dress it flat. The extra class it adds is well worth the twenty minutes it takes.

On small gear like this I don't heat the aluminum to soften it. Make the bends by clamping the blank between two pieces of wood. The corners of the wood will crush slightly, giving the bend a small radius. A coat hanger wire pattern bent from the pattern on the plans helps to get it right the first time.

A lightweight axle can be made from a #6-32 socket head screw with a steel washer under the head and an elastic stop nut locking it in place on the leg. This is lighter than most of the small commercial axles I've seen. Once the nut is in place and tight, take a file and remove tops of the exposed threads. This reduces the diameter just a bit so a piece of 5/32" O.D. brass tubing will slide on and cover the threads, making a bearing surface. Redrill the wheels for a sliding fit on the tubing and install them. Wheel collars look bulky on small wheels. A better way is to hold them on with a plain #6-32 nut (even on those partly filed away threads). With the brass tube trimmed just slightly longer than the width of the wheel hub and slipped in place, mount the wheel. Put the nut on and snug it against the end of the tube. This gives the wheel the required clearance. Cut the excess axle off flush with the face of the nut.

With a soldering iron, flow a smooth coat of solder over the face of the nut and axle. Looks like a "full moon" hub cap when completed. They will never come off unless you want them to. A slight twist with a pair of pliers will remove them without damage.

Two #8 nylon screws tapped into the hardwood support in the fuselage give plenty of holding strength for a 31 oz. model. Haven't had a screw break or pull out yet even with dead stick landings in the weeds. To dress up the wheels and make them look more "scale," mount them one at a time on a #8 machine screw and chuck them in the drill press or on your drill motor. Use a piece of coarse sandpaper and round them off as shown. One last thing: Align the wheels with a slight camber (it just looks good), and a very slight toe-in (that helps tracking).

Receiver, Servos, And Battery:

Both the small sized receiver (Futaba FP-R114) and the standard size (FP-R128 DF) were used. For the larger receiver, the hole in F3 can be widened. For servos, I used the small Futaba S133's and RCD Apollo 24's. Silicone cement has proved excellent for mounting servo trays to the side rails. It's a good vibration damper and the trays can simply be pulled free if need be. Though NyRod are shown for the hook-up of controls, pushrods work just as good. Unit #1 had split bamboo pushrods. The 270 mAh size pack is large enough for several flights and saves a little weight; however, Unit #1 carried a 600 mAh pack with only a small weight penalty. The batteries can be moved forward as far as the fire wall if required and the servo tray could be moved also, though that should not be necessary. Don't forget to mount the batteries in foam.

Set-up:

Make sure the wing is not warped. It should be checked with the wing screwed down and the bottom surface near the screws in contact with the top of the fuselage. A Robart wing incidence meter is the easiest way to go, but a simple jig with some straight sticks can be set-up to do the job. Just eyeballing a symmetrical wing is not reliable. I tried that on #1 and it required considerable aileron trim the first flight to get it down shiny side up. A check with the meter at home revealed a difference of about 1° from left to right. If you do find a warp, cut an airfoil shaped hole in a piece of foam packing and clamp it to your workbench. Stick one wingtip in the hole and gently twist in the opposite direction while heating with your hot air gun. It will take several tries to get it just right.

Aileron throw should be about ± 3/16", elevators ± 3/8", with the rudder set at about 5/8" to 3/4" each way. Check to see that the tail wheel is set for a straight roll with the rudder at neutral. Don't forget the toe-in on the mains. The engine is aligned 0°-0°. You may want to shim it later but start with 0°-0°. Assuming the controls all work smoothly and the battery is charged up, you are ready to head for the field.

Flying:

For your first test flight you want the C.G. 2" aft of the wing leading edge. There is plenty of room ahead of the servos or under the fuel tank to move the battery for balance. After a range check you are ready to start the engine. If the engine is new out of the box, run a few tankfuls through it so you can establish a reasonable idle. Taxi out and try a few turns before trying a high speed run down the strip. Like most taildraggers it takes full back on the stick to keep the tail down at low speeds. As you add on throttle, a bit of right rudder will hold it straight. As you build speed, ease off on the elevator and the tail will come up for faster acceleration. When you get flying speed, a touch of elevator will give you climb-out. Get some altitude and try a few slow turns. After checking out the trim you can have some fun. The ailerons are quick but not overly so. You can adjust the throws to your liking after the first flight. After a few flights you will be ready to start moving the C.G. aft. Try moving it back not more than 1/8" at a time, measured with the tank empty. A little arithmetic tells me the C.G. moves back almost 0.3" when the tank runs to empty.

Landing is the same as with the larger sport models. Throttle back and get the feel of where it starts to settle. In the downwind leg, ease back on power. Bring it around and on final you can set up a sink rate to put it right where you want it.

Small models need not be flitty or wild. They will behave and perform well if you build straight, manage the C.G., and have reasonable control throws.

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