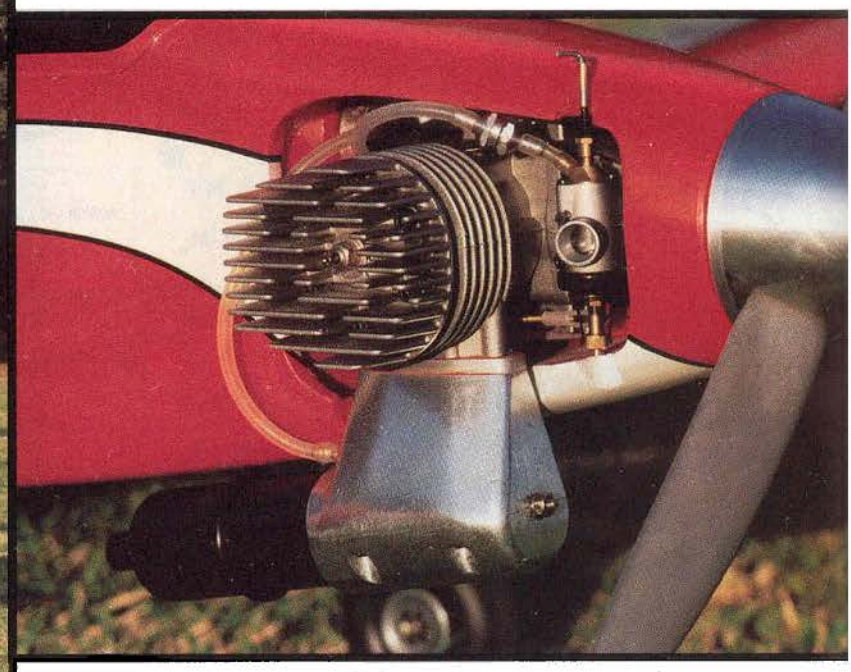
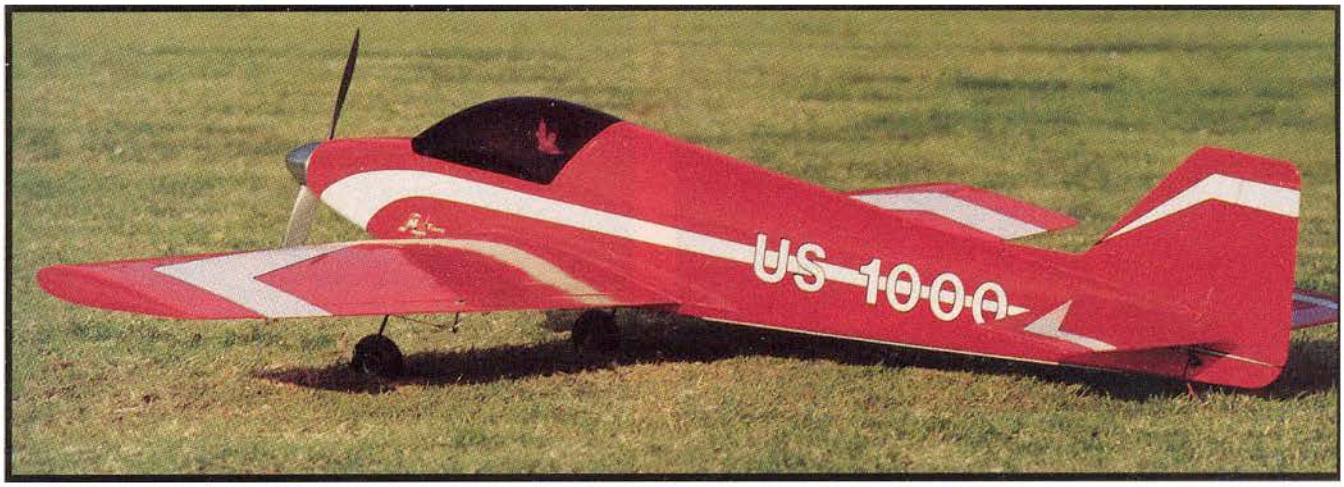


By Jim Feldmann

ULTRA SPORT 1000

"BIGGER FLIES BETTER" MEETS "THE BEST FLYING SPORT PLANE EVER"



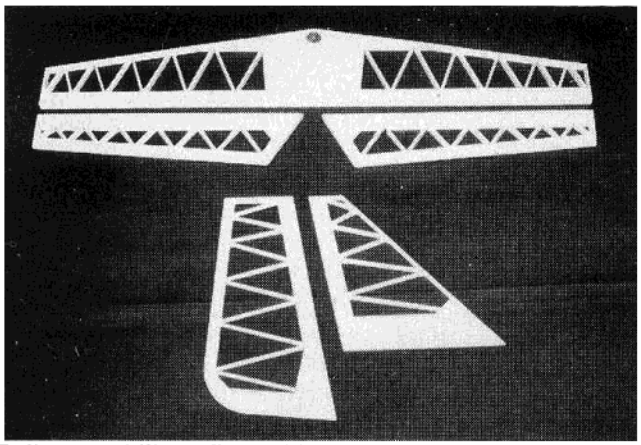
Three years ago I felt there was too big a gap between the average sport airplane and true competition pattern planes. The Ultra-Sport 60 (RCM plan #1048) was designed to fill that gap by offering pattern like performance, with the simplicity and easy handling of a sport model. Apparently many of you agreed with me because the Ultra-Sports, both 60 and 40, have been very successful.

Today, I see another big gap in the marketplace. O.S. makes an exotic (and expensive) supercharged 1.20, but there are very few airplanes available to put it in which can utilize its potential. Super Tigre makes a simple (and not very expensive) 1.5 cu. in. 2-stroke (the 2500) but most of the airplanes you could put it in are in the giant scale category, where the slower turning Super Tigre 3000 with more torque is a better choice.

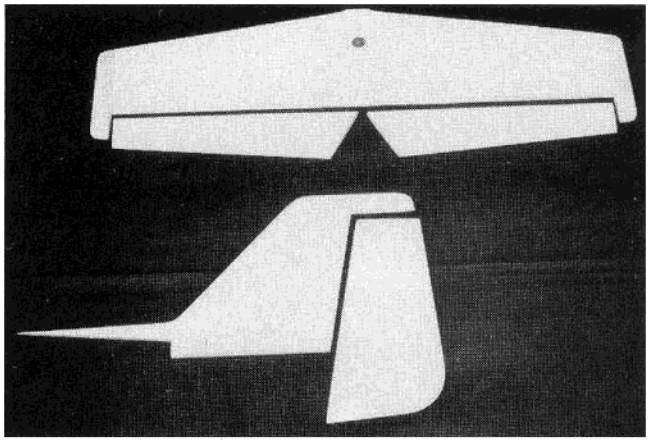
There are a few aerobatic sport planes available which can comfortably handle a regular 1.20 and a very few suitable for the 3000, but nothing that offers advanced sport performance for the engines in-between. So there's the challenge; a single airplane that offers Ultra-Sport performance and simplicity for engines in the 1.08 to 1.60 range.

And the challenge has been met! The Ultra-Sport 1000 (that's 1000 sq. in.) flies just about like the Ultra-Sport 60, and it performs very much the same on a 1.08 2-stroke, a second generation 1.20 4-stroke, or a 2500. A 1.60 twin 4-stroke will fly it very nicely, and with a supercharged 1.20 it's out of sight (literally).

Well, okay, suppose you don't have one of those engines lying around. Why would you want to go to the expense of buying one and building a big airplane that flies "just about like a 60?" Well, big airplanes **are** easier to fly, and that means that with the



Built-up stabilizer, fin, rudder, and elevator cores before sheeting. Round spot on front of stab is 3/4" fender washer.



Cores are sheeted with 1/16" hard balsa, then solid balsa leading edges and tips are added, which may be rounded or sanded to an airfoil.

same skills, you can fly the big one better than you can fly the smaller one. They're easier to see, and those big engines sound better too. And last but probably not least, big airplanes are **impressive**! If you went to the field with an Ultra-Sport 60 and Ultra-Sport 1000, which one do you think would draw a crowd?

Requirements

The Ultra-Sport 1000 is no more difficult to build than the 40 and 60 size Ultra-Sport, and it's even easier to fly. Because of its extra size and weight though, the potential for destruction is greater in the event of a mishap. For this reason, I wouldn't recommend the Ultra-Sport 1000 to novice builders or novice fliers. If you're thoroughly comfortable with building and flying an all balsa, symmetrical airfoiled, low wing aircraft, then you're ready for the Ultra-Sport 1000.

The Ultra-Sport 1000 uses six standard servos (plus a 180 degree retract servo for the retract gear option) and an 800 mA receiver battery.

You will need to have your chosen engine on hand before you build the fuselage, and if you will be using retracts, you will need those to build the wing.

Cautions

Every experienced modeler has his favorite "rules of thumb" concerning control systems and set-up. But remember, the Ultra-Sport 1000 is in a new size category, and some of the things that work fine on smaller (or larger) aircraft won't work here.

All of the hardware and accessories recommended on the plans and in the Bill of Materials have been tested and found to be adequate for a 12 lb., 100 mph airplane. Why take a chance on something else?

The recommended control travels and C.G. were selected to provide responsiveness typical of a 60 size sport plane, without any nasty surprises. Use them for your first few flights, then adjust to your own preferences after you've gotten used to the airplane.

CONSTRUCTION

Tail Feathers

Mark the center of the 3/8" plywood stab spar and drill a 5/32" hole for the stab mount screw. Glue the 3/4" fender washer over the hole.

Assemble the stabilizer and elevator cores, and the vertical fin and rudder cores over the plans. (Don't add the stabilizer and fin leading edges or tips yet.)

Remove the cores from the board and sand the outline of the rudder to match the shape on the plans.

Sand the stab and fin smooth and then sheet both sides with 1/16" hard balsa. (Cut a hole in the sheeting to clear the fender washer.)

Draw a line down the center of the trailing edge of the elevators and rudder, then sand one side of each piece down to the line.

Sheet the sanded side of the elevators and rudder with hard 1/16" balsa. Turn each piece over and sand the other side down to the centerline, then sheet that side.

Pin the stab and vertical fin back over the plans and glue on the leading edges, tips, and the dorsal fin.

Tack glue the elevators to the stab and the rudder to the fin, trim the stab and fin tips to match the outline on the plans, and sand the rear of the tips to match the taper on the elevators and rudder. Sand the top of the fin tip and the outer edges of the fintips to a rounded cross section.

The leading edge of the vertical fin, dorsal fin, and stab can either be rounded or sanded to an airfoil shape. (See plans.)

Now remove the elevators and rudder and sand their leading edges to a "V" shape.

Temporarily install the hinges and make sure that the elevators and rudder move freely.

WINGS

Prepare LG Components

Fixed Gear:

Measure 1/4" from one end of the 1/2" x 3/4" x 7¼" grooved hardwood main gear block and draw a line across the ungrooved side of the block.

Glue the 1/2" x 3/4" x 1½" grooved hardwood vertical gear block to the main gear block with the grooved side on the line and facing the short end of the main block.

Using the groove in the short block as a guide, drill a 3/16" hole through the main block.

ULTRA SPORT 1000

Designed By:
Jim Feldmann

TYPE AIRCRAFT
Advanced Sport

WINGSPAN
74 Inches

WING CHORD
13¾ Inches (Avg.)

TOTAL WING AREA
1015 Sq. In.

WING LOCATION
Low Wing

AIRFOIL
Symmetrical

WING PLANFORM
Double Taper

DIHEDRAL, EACH TIP
1⅜ Inches

OVERALL FUSELAGE LENGTH
62 Inches

RADIO COMPARTMENT SIZE
(L) 16" x (W) 4½" x (H) 2¾"

STABILIZER SPAN
28½ Inches

STABILIZER CHORD (incl. elev.)
7½ Inches (Avg.)

STABILIZER AREA
225 Sq. Inches

STAB AIRFOIL SECTION
Flat

STABILIZER LOCATION
Top of Fuselage

VERTICAL FIN HEIGHT
8½ Inches

VERTICAL FIN WIDTH (incl. rud.)
10 Inches (Avg.)

ENGINE SIZE
1.08-1.5 (2500) 2-stroke
1.20-1.60 4-stroke

FUEL TANK SIZE
12-16 Ozs.

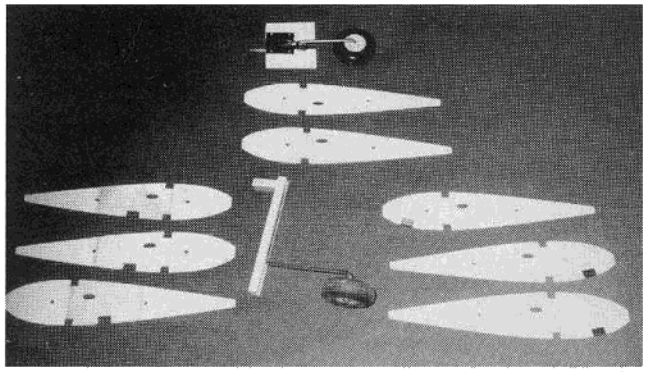
LANDING GEAR
Conv./Tricycle/Retract

REC. NO. OF CHANNELS
4-5

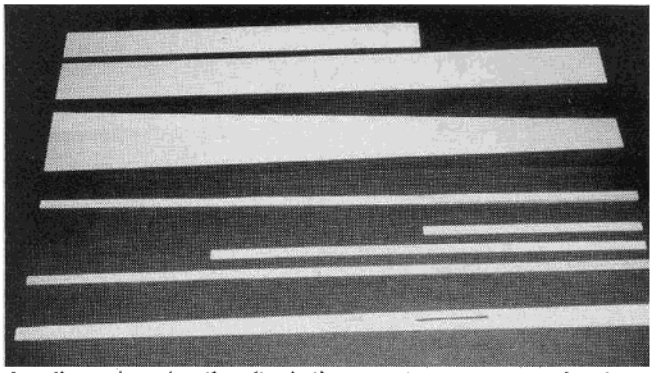
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail., Ret.

BASIC MATERIALS USED IN CONSTRUCTION

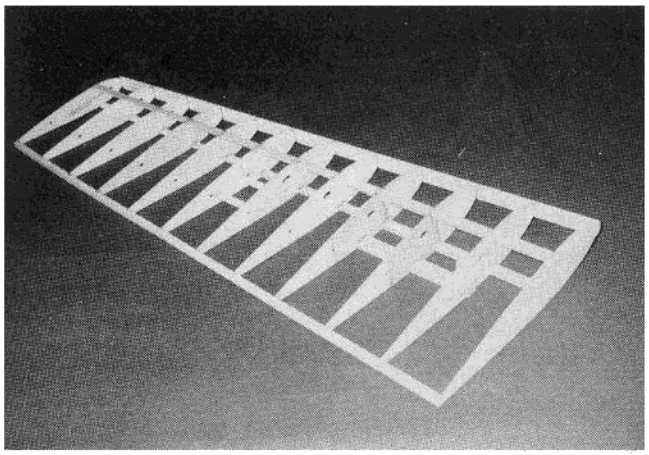
Fuselage	Balsa & Lite Ply
Wing	Balsa & Spruce
Empennage	Balsa
Wt. Ready To Fly	184-200 Ozs. (11 Lbs. 8 Ozs. - 12 Lbs. 8 Oz.)
Wing Loading	26-28 Oz./Sq. Ft.



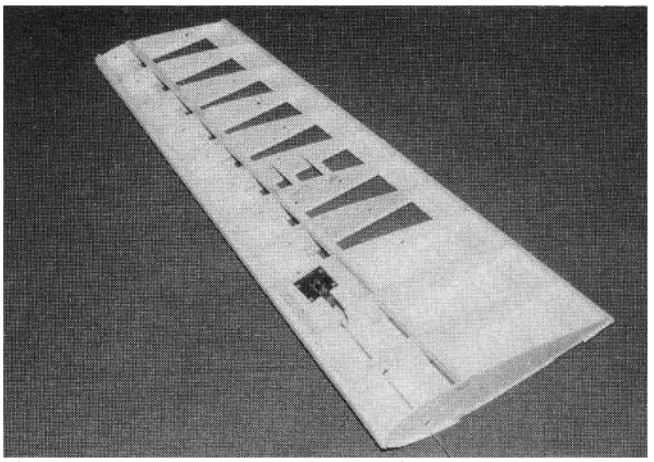
The basic landing gear parts are shown for fixed tricycle (left), fixed tail dragger (right), and retracts (top).



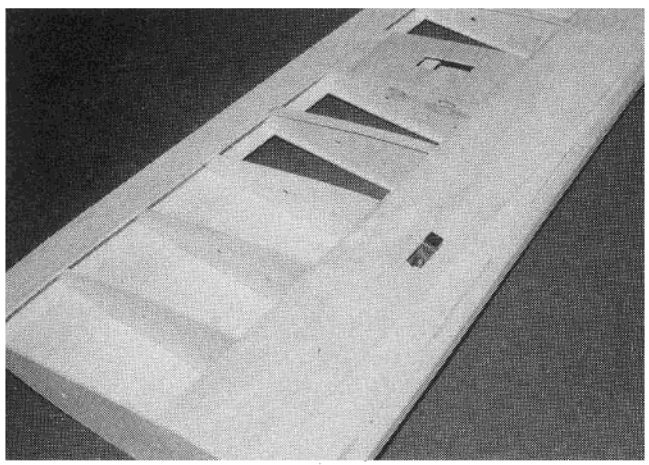
Leading edge sheeting (top), three part spruce spars (center), and the trailing edge support jig are made up before assembling the wing.



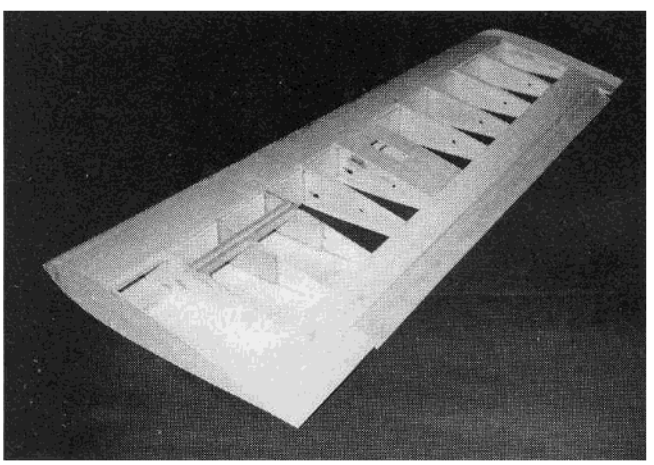
The basic wing structure is very simple. Note trike gear blocks and servo rails already in place.



This wing has been sheeted on top and turned over to show the retract installation. The next step is to sheet over the retract mechanism.



After the bottom sheeting is applied, the gear strut and wheel are installed and the wheel well cut to fit. Note sheeting over servo bay.



Spar webs, aileron, and wingtips installed, but no bottom center sheeting yet.

Test fit the 3/16'' wire main gear struts into the assembled gear blocks. Using scrap balsa, fill the notch beyond the strut at both ends.

Glue the 1/16'' plywood landing gear doublers to ribs W-2, W-3, and W-4. For fixed tail dragger gear, use the front doublers, and for tricycle gear, use the rear doublers. Check the plans and be sure to build **a right and a left** version of each rib.

Cut out the gear block notches and test fit the gear blocks. The block must extend 3/32'' below the rib so that it will be flush with the bottom sheeting.

Retracts:

Glue the 1/16'' plywood rib doublers to the front of W-3 and W-4. Check the plans and be sure to build a **right and a left** version of each rib.

Draw a line on each doubler from the rear bottom corner of the leading edge to the front bottom corner of the bottom spar. Now draw a line 1/4'' above the first one. These lines indicate the position of the gear mounting rails.

Glue 1/4'' triangle balsa reinforcement to the doubler with the wide side of the triangle on the upper line and facing down.

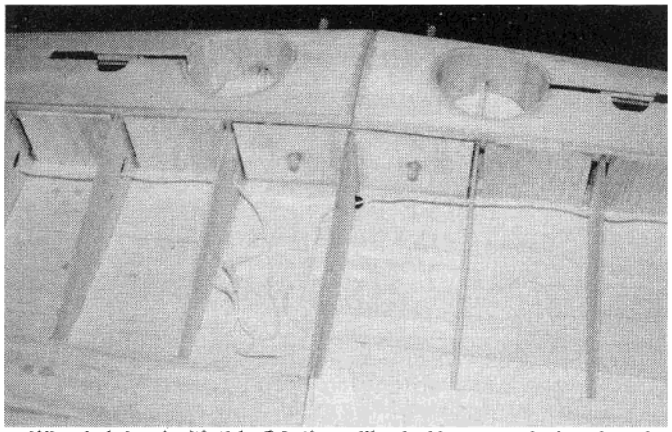
Prepare Wing Components:

Cut the spar doublers and spar triplers to length and taper the last 2½'' at one end of each piece. Assemble the spars as shown on the plans.

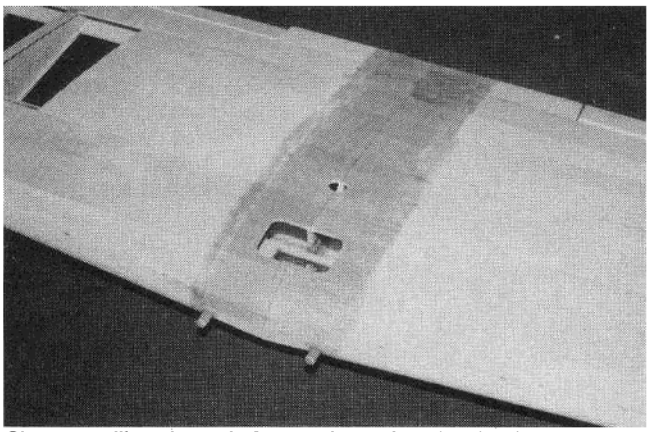
Glue a 3/32'' x 1¾'' x 24'' balsa sheet to the front of each 3/32'' x 3'' x 36'' balsa leading edge sheet.

Using a straight edge, cut each leading edge sheet so that it is 4⅝'' wide at one end and 2¼'' wide at the other end.

Cut the T.E. support jig from 1/4'' balsa. It should be 36'' long, 1¼'' wide at one end and 5/8'' wide at the other end.



Wing is joined with thin CA, then dihedral brace and wing dowels are added. The cord is tied to the servo rails on each side, and will be used later to pull the servo wires through.



Six ounce fiberglass cloth completes the wing joining process. This is the retract wing with servo mount visible below access hole. Note servo wire exit behind spar.

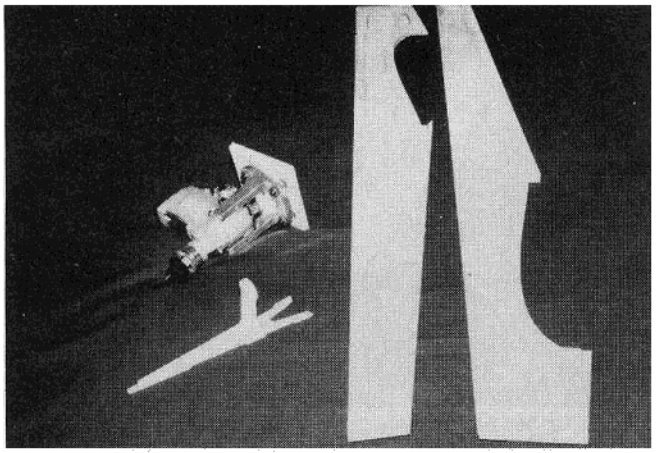
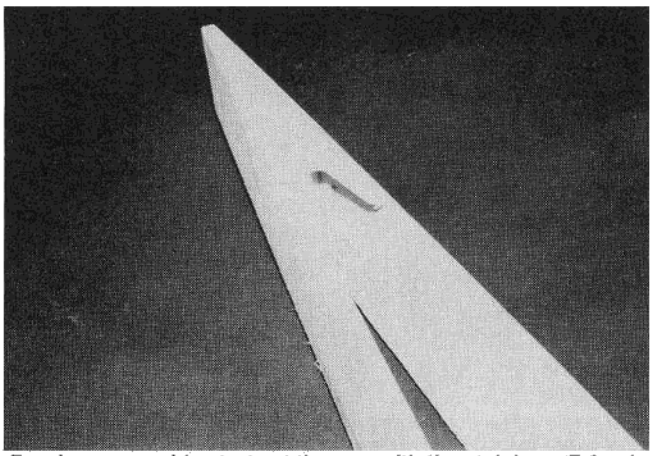
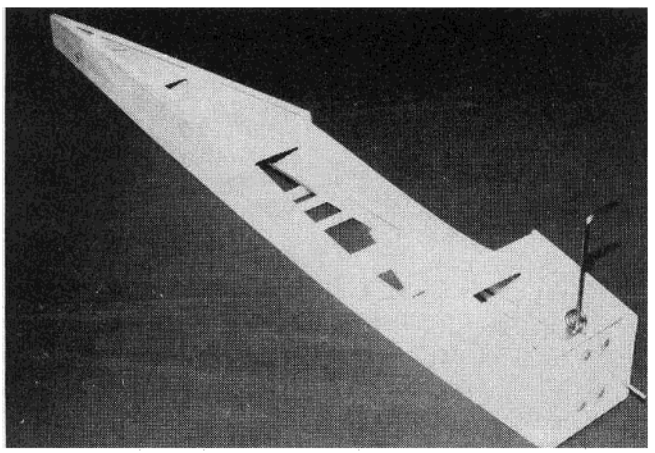


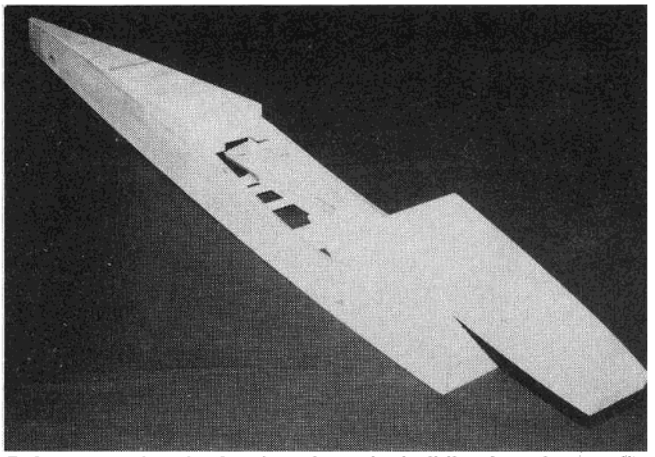
Photo doesn't show much detail, but these are the assembled fuselage sides, isolated engine mount, firewall, and the stab base/F-6 sub assembly.



Fuselage assembly struts at the rear with the stab base/F-6 sub assembly glued between the fuse sides. This is actually done upside down over the plans.



The basic fuselage box is very simple. Here the nosegear brackets and all of the pushrods are already installed.



Before removing the fuselage from the building board, you will sheet the bottom rear and add the chin block to the front. The fuel tank is already in.

Assemble Left Wing:

Pin the wing plan to your building board, pin the T.E. support jig in position, then cover the plans and the jig with protective plastic.

Pin down the bottom spar with the doubler and tripler at the root end and facing up.

Mark the rib positions on the leading and trailing edges with a pencil.

Glue all of the ribs to the bottom spar except W-1.

Glue the 3/8'' x 3/8'' x 36'' balsa T.E. to the ribs, then pin it down to the T.E. support jig.

Glue the 1/2'' x 1¼'' x 36'' balsa L.E. to the front of the ribs. The L.E. must extend at least 1/8'' above and below each rib, so that the L.E. sheeting can be glued to it.

Glue the top spar in place, with the doubler and tripler at the root end and facing down.

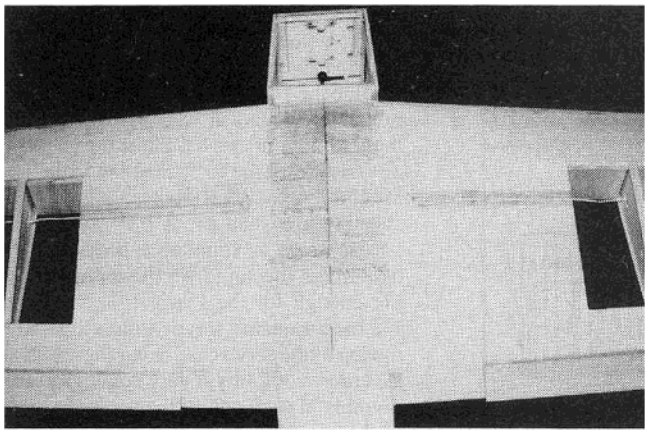
Now install W-1 using the W-1 angle template against the root side to set the proper angle.

Sand the top of the T.E. to match the slope of the airfoil, then using a long sanding tool, go over the ribs and spar to eliminate inperfections.

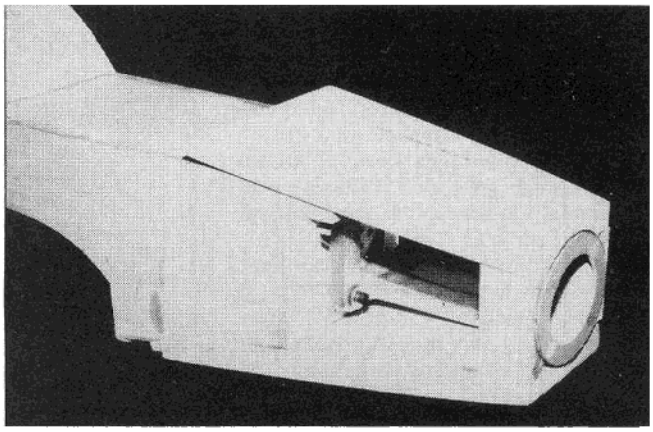
Glue the 3/32'' x 2'' x 36'' T.E. sheeting in place.

Block up the L.E. with scrap balsa, sand the front of the L.E. sheet to an angle to match the back of the L.E., then glue the L.E. sheet in place. Note that the sheeting only covers the front half of the spar.

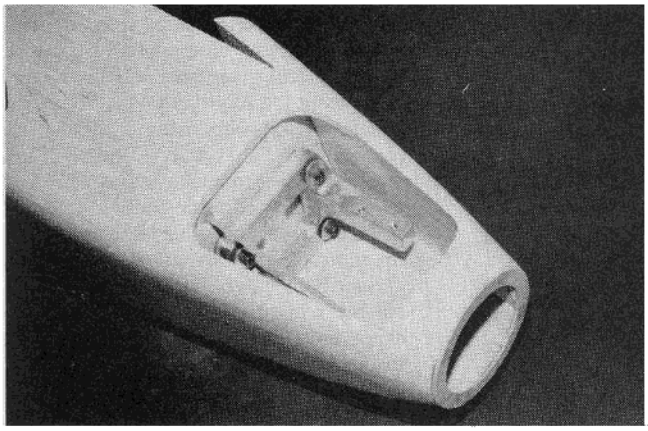
Glue on the 3/32'' balsa center sheeting and add 3/32'' x 3/8'' balsa cap strips to all remaining ribs.



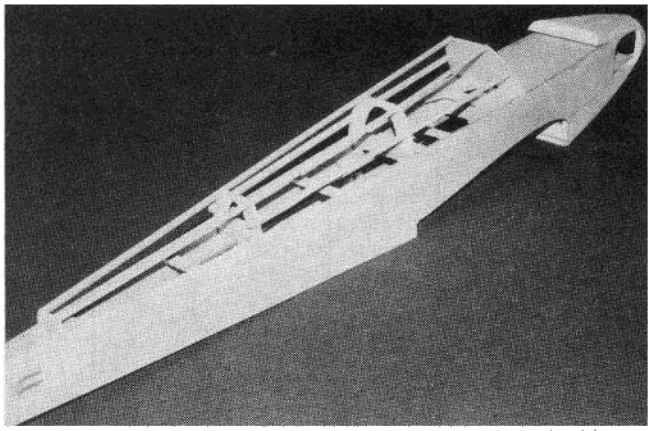
Fitting the wing to the fuselage. This view clearly shows the nose gear set-up and the right thrust built into the firewall.



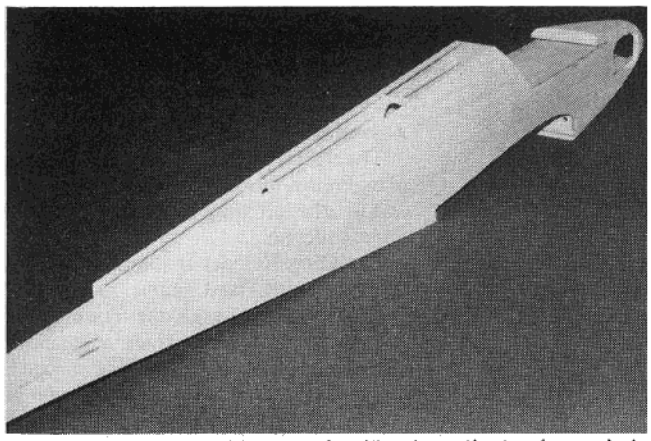
The cowl is carved from balsa blocks assembled around the engine. That way you know it fits. Get out your knife and a coarse sanding block.



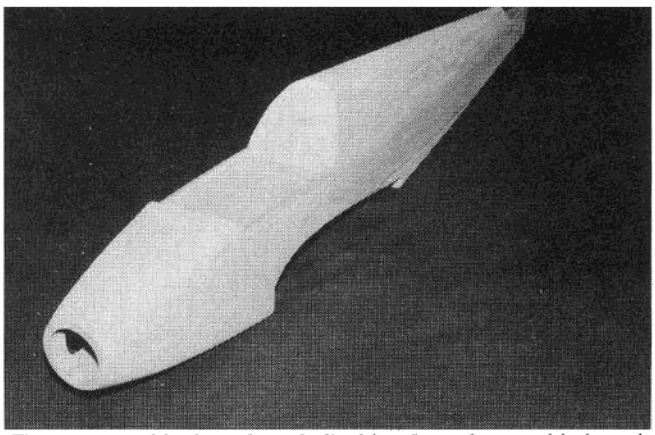
And this is the result. This is actually an easy shape to achieve, there are no concave surfaces, and the curves are gentle.



Hard balsa stringers provide support for the turtledeck sides.



After the sheet balsa sides are glued in place, the top is sanded flat for the 5/8" balsa rear top block.



The rear top block and cockpit sides have been added, and everything sanded to shape. Use 80 grit (coarse) sandpaper, and this phase goes quickly.

Remove the wing panel from the board and touch up any dry glue joints. Remove the T.E. support jig and the plans from the board.

Now place the wing panel upside down on the board, pin the T.E. to the support jig and block up the leading edge.

For Retract Gear:

Glue the 1/4" plywood retract mounting rails in place between W-3 and W-4.

Install the retract mechanism with the gear strut but without a wheel. Cut clearance holes in the ribs as required for the mechanism and its pushrod (see rib detail). Hook up the pushrod and cycle the gear a few times to make sure everything clears.

Remove the strut, but leave the retract mechanism in the mount. Measure exactly where the strut socket is, so that you can cut the L.E. sheeting in the right place to find it after the sheeting is installed.

For Fixed Gear:

Install the assembled gear block. Use epoxy, and be sure to put the vertical grooved block at the root end (at W-2).

Glue the 1/2" balsa triangle reinforcement under the main gear block at W-4.

For All Options:

Install 1/16" plywood reinforcing plate to the back of the L.E. between W-1 and W-2.

Sand the T.E. to match the slope of the airfoil, sand off any glue blobs or other imperfections on the bottom of the wing, then install the bottom T.E. sheeting.

Sand an angle on the back of the L.E. sheet, and glue it on. If you are using fixed tail dragger gear, you will need to cut a slot

in the sheeting to fit around the main gear block. If you are using retracts, you will be sheeting over the retract mechanism.

Glue the 1/8" x 1/2" x 3½" spruce servo rails into the slots in W-6 and W-7, spacing them to fit your servos. Sheet the bottom of this bay, from the L.E. sheeting to the T.E. sheeting with 3/32" balsa, allowing the sheeting to extend about 1/8" past the ribs on each side to simulate cap strips. Cut a hole in the sheeting over the servo rails just big enough for the servo to pass through. For most standard servos, this will result in the top of the servo case being flush with the sheeting, with only a very small gap in the sheeting at each end of the servo for access to the mounting screws.

Glue a cap strip on W-5 and W-8 through W-12. Do **not** install the bottom center sheeting at this time.

Remove the wing panel from the board and recheck your glue joints. Install 3/32" balsa **vertical grain** spar webs in each rib bay except the root bay (W-1, W-2).

The ailerons are made by gluing two pieces of 1/4" x 1½" x 36" balsa aileron stock together to make one 1/2" x 1½" aileron. Cut a 2" piece and a 6" piece off the aileron stock and glue these pieces to the tip and root end respectively.

Sand both ends of the wing panel smooth, cut the wingtip block to the approximate shape and glue it to the tip end, then sand it to shape.

Make a light ply template for the L.E. shape as shown on the plans. The shape of the L.E. is very important to the performance of the finished airplane. Carve and sand the L.E. to match the template at the root and tip, and taper it smoothly from one to the other (also be sure the two wing panels match).

Sand a "V" on the front of the aileron, cut hinge slots and test fit the aileron.

Assemble Right Wing:

The right wing is built over the right wing plan. Follow the directions for the left wing, and use the left wing plan as a guide to the internal details.

Completing Retract Installation:
(Omit if using fixed gear)

Cut a hole through the bottom L.E. sheeting over each retract mechanism. These holes should be just large enough to allow the gear strut to be installed with the gear in the extended position.

Mount a 2¾" wheel on each gear strut and install the struts in the retract mechanisms. With the gear in the "down and locked" position, make sure the wheels are properly aligned (0 degree to 1 degree toe in).

Slowly retract the gear, cutting away the L.E. sheeting and W-2 rib as required to clear the struts and wheels as they retract.

Re-extend the gear, then enlarge the wheel well to 3⅛" diameter. Check frequently to be sure that the opening remains centered around the retracted wheel. W-2 should be removed all the way to the top sheeting.

Use either vertical grain 1/16" balsa or a section of foam cup to form the walls of the wheel wells.

Cut retract pushrod clearance holes through both sides of the wheel wells so that the pushrods have a straight route to the retract mechanism.

Install pushrods and verify that the retracts work properly with no interference or binding.

Joining The Wing Panels:

Place the two wing panels together on a flat surface and block up one wingtip 2¾". Sand the root end of the wing panels until they fit together properly at that angle.

With protective plastic under the center section, hold the leading and trailing edges together with pins and lock the wings together by dripping thin CA into the center joint. Fill any minor gaps with thick CA.

Turn the wing over and cut a slot for the dihedral brace through the W-1 ribs immediately behind the spars.

Drill 5/16" holes for the wing dowels in the 1/8" plywood dihedral brace as shown on the template, then using epoxy, glue the dihedral brace to the back of the spars.

Put a mark on the front of the L.E. 1¾" from the center joint on each side. Drill 5/16" holes for the wing dowels on these marks. Now install the dowels with 1/2" protruding in front of the L.E. and the rear of the dowel passing through the dihedral brace.

Now turn the wing over and cut a 3/4" hole in the center of the top sheeting about 1" behind the spars for the servo wires to exit the wing. This hole should include a section of W-1 so that it provides access from one wing to the other.

Tie a string to the servo rails in one wing, pass the string through the servo wire holes in the W-6 through W-1 ribs and on out the other wing and tie it to the other servo rails. Leave plenty of slack and be sure you can reach the string through the servo holes in the servo bay sheeting, and through the 1/2" hole in the center sheeting. You will use this string to pull the servo wires through the wing after the wing is covered.

Install the 3/32" balsa bottom center sheeting. If you are using tricycle gear, you will need to cut a slot in the sheeting to clear the main gear block.

Looking down at the wing from the top, the leading and trailing edges at the center section should be sanded straight across to match the formers in the fuselage. The straight section of the L.E. is 5¼" wide and the straight portion of the T.E. is 4½" wide.

Apply a 4" wide strip of 6 oz. (heavy duty) fiberglass cloth to the center joint, top and bottom, using resin, thinned epoxy or thin CA.

Glue the 1/16" plywood wing bolt plate on top of the fiberglass at the trailing edge on the bottom of the wing.

For Retract Gear:

Cut an opening in the top sheeting for the retract servo (see plans). Glue the retract servo mount to the top of the wing dowels.

Install a 180 degree servo, hook up the retract pushrods and do a final check that everything is working properly.

FUSELAGE

Basic Box:

Pin the fuselage sideview plan on the board, and select the correct firewall position for your engine from the engine application table on the plans. If you are using an engine which is not listed on the chart, assemble the engine and engine mount, and check the total length against the plan and pick the combination of firewall and spinner which comes closest. Cut the fuselage sides and front doublers to the correct length for the selected firewall position. (Note that the firewall is installed with 2 degrees right thrust built in so the **right** side and **right** front doubler are 3/16" shorter than the left.)

Cut the firewall to fit in the position selected, then bevel the top and bottom edges as shown on the plan. Mark the "front and top" of the firewall for future reference.

Draw a line on the front of the firewall 1/16" above the vertical center.

Determine the correct left offset and make another line that far to the **right** of the horizontal center of the firewall. The center of the engine mount must be at the point where these two lines cross.

I strongly recommend an isolated (soft) engine mount for improved airframe and radio life. Carefully center the mount over the lines on the firewall and drill the required holes. Then temporarily install the mount.

If you are using tricycle gear, turn the firewall over and draw a line along the horizontal center. The gear strut will go on this line. Drill holes to mount the nose gear brackets. The bottom bracket is located 1/16" above the bottom of the firewall and the top bracket should be just below the top engine mount bolt.

Temporarily install the engine in the mount and determine where the throttle cable and fuel line holes will be. Then remove the engine and mount and drill the holes.

Now is the time to permanently install the nose gear brackets if you're building a trike. Remember to drill them out for the 3/16" wire strut.

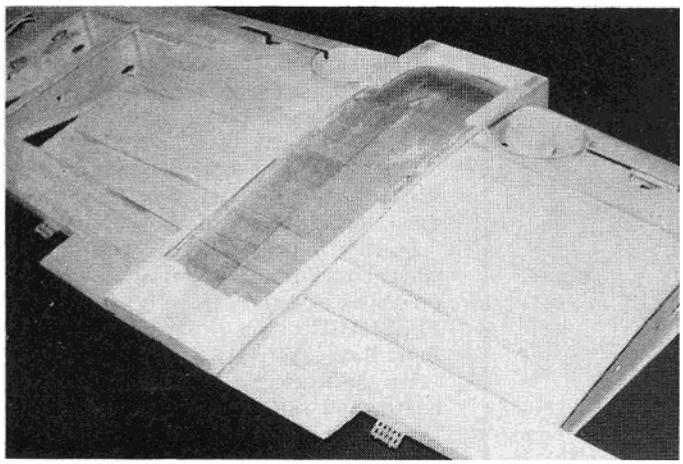
Assemble the left fuselage side and the left rear fuselage side over the plan. Then install the front and rear doublers. Note that the front doubler ends 3/8" behind the front of the fuse side, and the rear doubler ends 1/8" below the top of the fuse side and 1¼" from the rear edge.

Now assemble the right fuselage side but be sure to turn it over before gluing on the doublers.

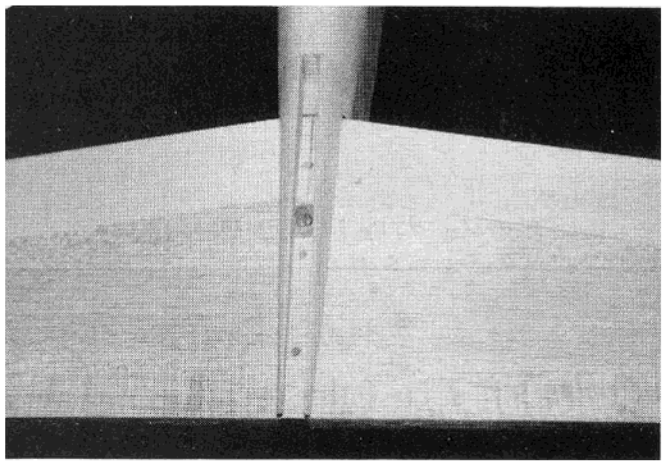
Drill pushrod exit holes through the fuselage sides as shown on the plans. Glue the tail wedge to one of the sides.

Glue the 3/8" triangle servo mount supports in place. Note that the flat side of the triangle faces down.

Install the 3/8" triangle along the bottom edges of the fuselage sides from the rear of F-4 to the front of the tail wedge. Then pin the sides together back to back and sand all of the edges to match.



The belly fairing is built up while the wing is mounted on the fuselage. Note the 4" heavy fiberglass reinforcement on the bottom of the wing.



After the horizontal stab is mounted in the usual way, a large sheet metal screw is installed through the fender washer and into the stab anchor in the fuselage.

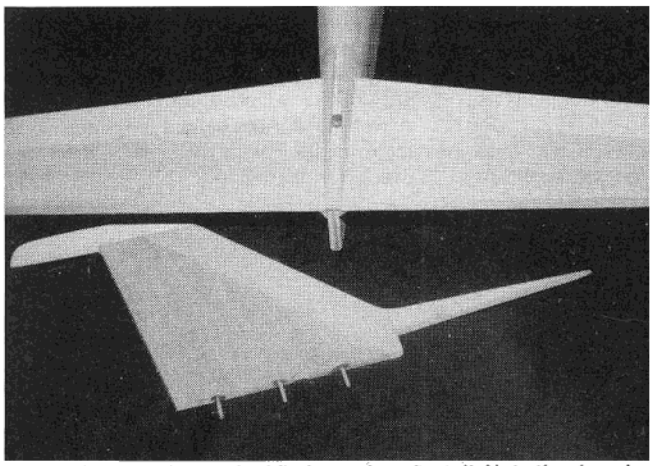
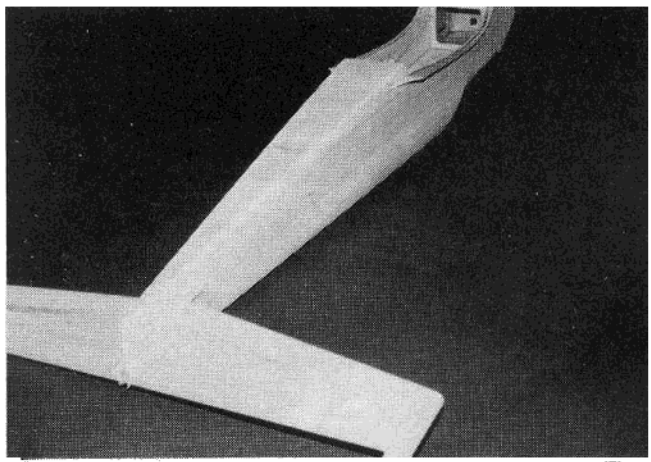


Photo showing the vertical fin is ready to install. Note the dowels already in place and the notch to clear the head of the screw in the stab.



1/2" balsa triangle is added under both sides of the stabilizer. The stresses on large airplanes are high, but this one doesn't need bracing wires. Also note the plywood wing fairings.

Draw a line on the bottom of the stab base 1/8'' from each side. This line is a guide to show the position of the rear doublers.

Glue F-6 to the bottom of the stab base, glue the 1/4'' plywood stab anchor block in place as shown on the plans, then add 1/4'' triangle along both sides of the stab base with the flat side on the line and facing outward.

Pin the fuselage bottom view plan to the board and pin the assembled stab base over the plan. Mark the position of F-2 and F-3 on the light ply fuselage top, then pin the fuselage top down over the plan.

Glue F-2A to F-2 and drill the wing dowel holes as shown on the plans.

Pin F-4 and F-5 over the plans and glue F-2 and F-3 to the fuselage top, making sure each is perpendicular to the board and centered between the fuselage sides.

Sand the tail wedge and the bottom triangle stock as required so that the fuselage sides fit together properly with the stab base in-between. When satisfied with the fit, glue the fuselage sides together and to the stab base and F-6. Do this over the plans and be sure that the stab base stays flat on the board and that both sides are perpendicular to the board. Use epoxy here to fill any gaps and to give you time to get the alignment right.

After the epoxy has thoroughly set, begin putting the sides together. Pin the sides to the board every few inches and glue them to F-5 and F-4 as you get to them.

When you reach the fuselage top, slip the firewall between the sides at the front and use a couple of rubber bands to hold the sides together. Then hold the fuselage top and the sides firmly against the board as you glue the sides to the top and to F-3 and F-2.

Now glue the firewall in place (remember, the fuselage is upside down so the ''top'' mark on the firewall goes at the bottom).

Add 1/2'' balsa triangle behind all four sides of the firewall, allowing enough of the triangle to extend beyond the top and bottom of the firewall so that the triangle can be sanded to match the angle of the top and chin blocks.

If you are using tricycle gear, use a long 3/16'' bit to drill through the gear brackets and the balsa triangle and light ply fuselage top. You will need this hole later to line up the gear strut hole in the chin block.

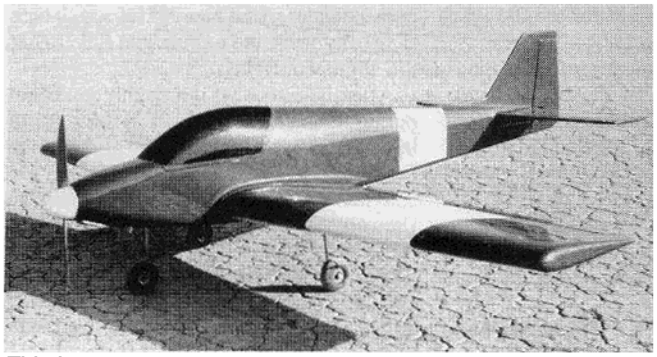
Install the throttle cable casing and the nose gear pushrod outer tube (if used), and then fuelproof the tank compartment including the part of the chin block which will be exposed inside the tank area.

Sand the fuselage bottom flat from F-2 to the firewall. Fit your fuel tank (as low in the fuselage as possible) with plenty of foam padding, then glue on the chin block.

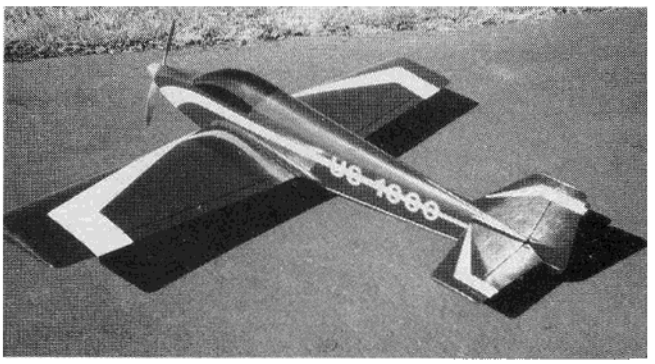
Glue in the servo rails and the two 1/4'' x 1/2'' balsa spreader bars as shown on the plans.

Now is the best time to install the elevator and rudder pushrod outer tubes. Glue the tubes to the fuselage sides at the exits and to the center support at F-5. Don't install the forward pushrod support yet.

Assemble the wing mount by gluing 3/8'' triangle along the three outer edges of one side of the 3/8'' plywood mount and 1/4'' triangle along the same edges of the other side. Sand the edges to provide a good fit between the sides and against F-4. When



This is prototype #1 with tricycle gear, an O.S. 1.20 Surpass II, and an ugly, but functional, hi-visibility trim scheme.



The second prototype with retracts, a Super Tigre 2500, and a lot more eye appeal.

satisfied, use epoxy to glue the assembled mount into the fuselage (1/4'' triangle facing you).

Now sand the bottom of the fuselage flat from F-4 to the rear end and sheet it with 1/8'' balsa applied with the grain running across the fuselage.

Remove the fuselage from the board and sand the top flat. If you're using tricycle gear, drill through the fuselage top, nose gear brackets, and the chin block with a long 3/16'' bit. Insert the nose gear strut and carve out enough of the chin block so that the axle is 5'' from the surface of the block.

Draw a line along the horizontal center of the rear edge of the chin block. Carve and sand the block down to this line in a smooth curve from just behind the firewall (see side view on plans).

Fitting The Wing:

Trial fit the wing in the wing saddle. You may have to enlarge the holes in F-2 in one direction or another, and you will probably have to sand the wing saddle a bit to allow the wing to seat properly. **Important!** Make sure the center of the L.E. and the center of the T.E. on both sides of the fuselage are exactly the same distance from the top of the fuselage sides.

Mark the location of the wing bolt holes on the wing bolt plate. Carefully center the wing by measuring from each wingtip to the rear of the fuselage. Hold the wing in position and drill the wing bolt holes through the wing and the wing mount with a 13/64 (#7) bit.

Thread the holes in the wing mount with a 1/4-20 tap, and drill out the holes in the wing with a 1/4'' bit. Then tighten the bolts and recheck the wing alignment.

Belly Fairing:

Glue the front and rear belly fairing formers to the leading and trailing edges, using scrap 1/16'' plywood as a temporary spacer to separate these formers from the fuselage formers.

Glue the front and rear belly fairing sides in position and then sand them to flow smoothly into the angles of the bottom sheeting and the chin block. (See plan side view.)

Cut two 1/2'' balsa filler blocks about 1½'' x 2'' and make a 1/2'' hole through each one to clear the wing bolt. Glue these blocks on top of the wing bolt plate, in front of the rear belly formers.

Add 1/4'' balsa triangle along the bottom edge of the belly fairing sides to provide extra material for rounding the corners.

Sand the blocks and triangle flush with the sides and formers, and then sheet the bottom of the fairing with hard 1/8'' balsa, grain running across the fairing.

Now round the corners of the bottom of the fuselage, the belly fairing, and the chin block (forward to the firewall). Use the drawing of F-2 and F-4 on the plans as a guide.

Cowl:

Determine from the engine application table which spinner size you need. Use the spinner backplate to draw the outside circle of the spinner ring.

Glue four small pieces of 3/32'' hard balsa scrap to the back of the spinner backplate, equally spaced around the circumference, then use the balsa pieces to glue the backplate to the spinner ring. Be sure the backplate and ring are properly aligned.

Temporarily install the engine and engine mount.

Shorten the chin block until the spinner ring just touches the chin block when the backplate is tightened against the engine. In this position the spinner ring should overlap the chin block by 3/8'' to 1/2''. Glue the spinner ring to the chin block.

Sand the top front of the fuselage to the correct angle and fit the front top block. The rear of the block should be in the position shown on the plans and the front should overlap the spinner ring by the same amount that the chin block did. Glue the front top block in place.

Fit the 1/2'' balsa left cowl side so that it protrudes 1/16'' beyond the fuselage side at the rear and overlaps the spinner ring 5/16'' at the front. Glue the left cowl side in place.

Remove your engine and engine mount. Make front and rear right cowl sides from 1/2'' balsa which approximately fill the spaces in front and behind the engine. Glue them in place with the same spinner ring overlap as the left side.

Don Anderson, inspiration and mentor (and he likes the airplane).

Nobody told me it was a dry lake. Ultra Sport 1000 on Stream 1.20 size ARF floats. The Ultimate in water sports.

BILL OF MATERIALS

Balsa Sheet & Strip
7 — 1/16 x 3 x 30 — tail sheeting wheel well sides
5 — 3/32 x 3/8 x 36 — cap strips
6 — 3/32 x 2 x 36 — TE sheeting, LE front sheeting
19 — 3/32 x 3 x 36 — Ribs, LE and center sheeting, turtle deck sheeting, spar webs
2 — 1/8 x 1/4 x 30 — fin and rudder ribs
3 — 1/8 x 3/8 x 36 — stab and elevator ribs
3 — 1/8 x 3 x 36 — W-1 ribs, bottom sheeting, belly fairing, F-6
4 — 3/16 x 3 x 48 — fuselage sides
4 — 1/4 x 1/4 x 36 — (hard balsa) turtledeck stringers, cockpit sides
1 — 1/4 x 1/2 x 30 — rudder TE, spreader bars
1 — 1/4 x 3/4 x 24 — rudder LE, fin TE
1 — 1/4 x 3 x 36 — rudder bottom, fin bottom, tail wedge, TE jig
2 — 3/8 x 3/8 x 36 — wing TE
1 — 3/8 x 1/2 x 30 — elevator TE
2 — 3/8 x 3/4 x 30 — elevator LE, stab TE
1 — 3/8 x 2 x 30 — stab center, fin LE and tip, dorsal fin
2 — 1/2 x 1¼ x 36 — wing LE
1 — 1/2 x 3 x 36 — stab LE and tips, cowl sides
1 — 5/8 x 3 x 36 — turtledeck top block
2 — 3/4 x 3 x 30 — chin block, front top block, stab filler blocks
2 — 1¼ x 2 x 12 — wingtips

Shaped Balsa
1 — 1/4 x 1/4 x 36 — triangle stock reinforcement
2 — 3/8 x 3/8 x 36 — triangle stock reinforcement
2 — 1/2 x 1/2 x 36 — triangle stock reinforcement
4 — 1/4 x 1½ x 36 — aileron stock, ailerons, center and tip TE's

Spruce or Bass
4 — 1/8 x 1/2 x 36 — spars
4 — 1/8 x 1/2 x 48 — spar doublers, triplers, servo mounts

Birch ("Aircraft") Plywood
1 — 1/64 x 6 x 12 — wing fairing base
2 — 1/16 x 6 x 12 — LE doublers, rib and landing gear doublers, wing bolt plate
1 — 1/8 x 6 x 12 — dihedral brace, retract servo mount
*1 — 1/4 x 6 x 12 — retract mounts
1 — 3/8 x 6 x 12 — firewall, stab spar, wing mount, stab anchor

Poplar ("Lite") Plywood
3 — 1/8 x 6 x 48 — fuselage doublers, formers, fuse top stab base

Other Wood
1 — 1/8 x 6 — birch dowel, fin reinforcement
1 — 5/16 x 12 — birch dowel, wing dowels
*2 — 1/2 x 3/4 x 12 — grooved hardwood landing gear blocks (3/16 grooves)

Hardware/Accessories
1 — Great Planes #CANPY 051 canopy
*1 — Great Planes —#WBNT 128 tailwheel strut
5 — Du-Bro #493 — control horns
*1 set — Du-Bro #156 — nosegear brackets
*1 — Du-Bro #166 — steering arm
18 — Sonic Tronics #129 — one piece hinges
3 — Sullivan #511 — solid wire pushrods
*1 — Sullivan #505 — nosewheel pushrod
1 — Sullivan #508 — throttle cable
2 — 6" threaded pushrods for ailerons
*2 — 9" threaded pushrods for retracts
*1 set — B&D mechanical main gear retracts
1 — 3/16 x 36 — music wire for main gear (fixed or retract)
*1 — 3/16 x 36 — music wire for nosegear
1 sq. ft. — 6 oz. fiberglass cloth
*1 set — landing gear straps, Goldberg #291
2 — 1/4-20 x 1½ nylon bolts
1 — #10 x 1¼ sheet metal screw
1 — 3/4" fender washer

Note: For engine mount and spinner selection, see Engine Application Chart on plans.

Clevis, wheels and wheel collars, fuel tank, screws nuts, covering and finishing materials are left up to the builder.

*Optional depending on landing gear configuration selected (see plans)

Fit and glue 1/2" triangle along all four corners inside the cowl from the spinner ring to the firewall.

Now cut away just enough of the right cowl sides so that you can reinstall the engine mount and engine.

Remove the engine and carve and sand the cowl to shape. (Use the spinner ring and the drawing of the firewall on the plans as a guide to the correct shape.)

Turtledeck:

Prepare the turtledeck sheeting as follows: Use a 3" x 36" sheet of 3/32" medium balsa. Make a mark at the top edge 20" from the left end. Make another mark at the left end 2" from the top. Connect these marks with a line, then cut along the line. Now flip the cut off piece over and glue it to the remaining top edge of the sheet, so that the line you drew is carried on past the right end of the sheet. Finally, cut the right end off 33" from the left end. You should now have a 3/32" balsa sheet 33" long, 1" wide at one end and 4½" wide at the other end.

Make a second sheet just like the first one, and sand both of them smooth.

Using the F-3A angle template, install F-3A in the location shown on the plans. Also install F-4A, F-5A and F-6A, making sure that each former is centered from side to side.

Install **hard** 1/4"square balsa stringers.

Now install the sheeting. Glue the bottom of the sheet to the top of the fuselage side, wet the outside of the sheet and then glue it to the formers and top stringer. Now you can use thin CA to glue the sheeting to the lower stringers.

Sand the top of the sheeting, formers, and stringers to a level flat surface and glue on the 3/4" balsa rear top block.

Carve and sand the turtledeck to shape and blend it into the fuselage sides.

Install 1/4" square balsa cockpit sides and scrap balsa filler which may be required where the cockpit sides meet the front top block. Add a piece of balsa between the bottom edge of the front top block and the light ply fuselage top to seal off the cockpit from the tank compartment. Sand the cockpit sides to blend with the fuselage sides.

Glue the 1/2" balsa stab spacer block behind F-6A. The grain should run front to back on this piece, not across the fuselage.

Cover the leading edge of the stab and fin with plastic wrap and pin them in place on the fuselage.

Prepare the 1" x 3/4" stab filler blocks by tapering them in two dimensions (see side view and bottom view plans).

Glue the filler blocks to the back of F-6A and the top of the stab spacer, but **not** to the stab or fin. Remove the stab and fin as soon as possible to avoid stray glue.

Sand the filler blocks to match the fuselage contours.

Wing Fairings:

Cover the center section of the wing with plastic wrap (do the top and both ends of the belly fairing), then mount the wing on the fuselage.

Press the 1/64" plywood fairing base against the surface of the wing and push it up against the fuselage side. Glue the base to the fuselage side with a bead of thick CA. Any gaps you find can be bridged with balsa scrap if the CA won't fill them. Note: The fairing base should extend 1/16" beyond the T.E.

Laminate a second layer of 1/64" plywood on top of the first, and do the other side of the fuselage the same way.

The 1/8" light ply wing fairing extension butts up against the rear of the wing fairing base, and is flush with the top of the base. Note that the extension is parallel with the top of the fuselage side, it does not continue the curve of the airfoil.

Now remove the wing and form the fairing with light spackle, rough shaped with a wet thumb. When the spackle has dried about 24 hours, sand off any high spots with a round sander and give the fairings a smooth coat of regular spackle or wall joint compound. Sand to final shape, then give all the spackle a coat of thin CA or UFO. This final coat is easy to sand smooth and gives the spackle a hard durable surface which covering sticks to very well.

Spackle fairings should also be used on the bottom of the wing and around the fin and stab. (Modelers often swear that this fuselage is fiberglass.)

Mounting The Tail:

Mount the wing to the fuselage, slip the stab into its slot and measure carefully to see that it is parallel with the wing when viewed from the top and from the rear. When satisfied, glue the stab in place with epoxy, rechecking alignment until the epoxy sets. Note that the fender washer must be facing **up.**

Drill a 3/32'' pilot hole through the fender washer, stab, stab base, and stab anchor, then install a #8 x 1¼'' sheet metal screw.

Drill 1/8'' holes straight into the bottom of the fin as shown on the plans, and glue in the 1/8'' reinforcing dowels. Drill corresponding holes through the stab and stab base. Check the fit of the fin in its slot. You may have to ''notch'' the bottom of the fin to clear the head of the sheet metal screw. Make sure the fin is lined up straight with the centerline of the fuselage and 90 degrees to the stab. When satisfied, glue the fin in place with epoxy, rechecking alignment until the epoxy sets.

Add 1/2'' balsa triangle reinforcement under the stab on both sides of the fuselage.

For Tail Draggers:

Cut a slot in the rear of the fuselage for the tailwheel bracket and drill a 3/32'' hole in the rudder for the strut. Test fit the rudder and tailwheel assembly to be sure no binding or clearance problems remain.

FINAL ASSEMBLY:

Covering, finishing, final assembly, and balance are left up to the builder. I prefer low-temp iron-on to keep the weight down. Start with the recommended control travel and C.G. and be sure to balance the airplane side to side as well as front to back.

FLYING:

Like all of the Ultra-Sports, the 1000 is capable of precise high speed aerobatics, but retains very gentle low speed characteristics. It goes exactly where you point it with no surprises.

If you've been flying smaller airplanes you will find that the Ultra-Sport 1000 is a little bit slower to respond, although the response is smoother than in the smaller models.

If you've been flying giant scale airplanes you will find that the Ultra-Sport 1000 is much quicker to respond than the average big model.

In either case, after a couple of flights, you will find that the compromise is easier to fly and more fun than either extreme.

Happy Flying! □

From RCModeler Apr. 1992