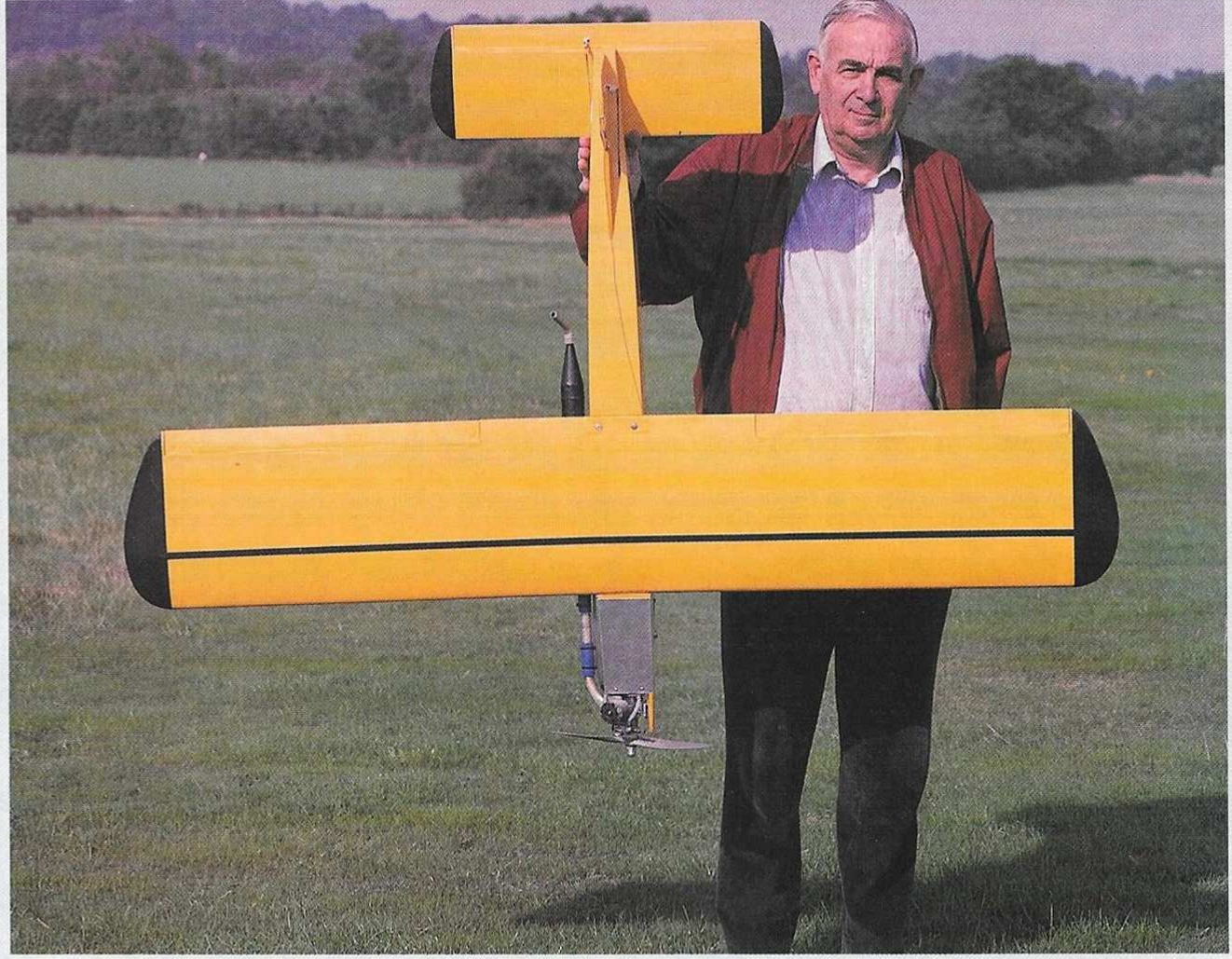


Chris lends scale to the 66" Uproar

UPROAR Revisited

Back in 1962, RAF Kenley was the venue for the 2nd World R/C Championships. After a spirited fly-off, Tom Brett took the trophy for the U.S., with Harry Brooks placing equal first for Great Britain, having come within 2% of the American's score (the FAI rules required that the scores had to differ by at least this amount). In third place came Chris Olsen (GB), with Frank Van den Bergh (GB) fourth, the resulting 2-3-4 earning Great Britain top place in the team results. Now, 34 years on, Chris Olsen presents an updated version of the model that he flew at the '62 World R/C Champs, designed with radios and engines of the '90s in mind...

The first Uproar was built in 1957 as one of a series of models designed for a Fox 29 that I had purchased earlier that year. Uproar seemed to fly pretty well compared to other models I had made that year. This came as no great surprise as one of them had a wing area of nearly 1000 sq.ins. and weighed 7 lbs, slightly under powered, even by the standards of those days!

The next year I started contest flying. Uproar was the best model that I had available so I used it, and continued to do so until 1964. The main reason that I used Uproar for so long was that the model mortality rate at this time was such that in some years up to ten models were used up. In the six years that I was flying Uproar in competition forty models were made, twenty eight of which were Uproars!

The aerobatic schedule used during this period was much less complicated than that used today and the advantages of a low wing position over that of a shoulder wing were, in my opinion, minimal - shoulder wing models were easier and quicker to build.

I have built thirty six Uproars since 1957, none of which were exactly the same. Each time a model was built some changes were made. This had the effect that with the large number of models built in a year problems were sorted out in less time than if only one or two models were produced. I also learned the hard way a lot about the aerodynamics and construction of aerobatic models in a much shorter time than other competitors in that era. This might be called the "up" side of tearing up a lot of models.

Uproar was designed at a time when the airborne radio, actuators and batteries weighed over 2 lbs. The receiver was about 3 x 2.1/4 x 2.1/4 ins. and weighed over 1 lb; some systems were even larger and heavier. For this reason the size of the model, particularly the dimensions of the fuselage were determined by the radio equipment. In recent years however it has been useful to have a model which is fully aerobatic and has room to put extra bits of equipment with which one might like to experiment.

Designed in the 50s, Uproar has been fully updated for flying in the 90s.

A number of people who have flown Uproar in recent years have been surprised that using modern radio equipment and engines the model performs so well. It was suggested that it would make a good aerobatic trainer. Uproar, with modern equipment, will perform any manoeuvre in the current aerobatic schedules. It is also simple to build.

The original model had some major changes made to the wing in 1960, a different aerofoil section (NACA-0015) and different wing construction. Since then the important changes have been to reduce the width of the elevator and ailerons and increase the length of the ailerons. It seems that, especially with proportional control, narrow control surfaces moved a lot work better than narrow surfaces moved a little. Conversely the fin and rudder were enlarged in the hope that this would increase rudder control, but I am not sure that this has worked as well as I had hoped.

The structure has been altered to an all sheet fuselage, wings and stabiliser. This has increased the airframe weight slightly but has also increased its strength and rigidity. This was necessary as modern engines are more powerful than older types. Early models were powered with Fox and ETA 29's; since then I have used a Merco 49 & 61, Irvine 40, OS 40SF, 46SF, 46VF and 61RF. The vertical performance of the latter was quite interesting as the model only weighed 6.1/2 lbs.

Basically what is needed for reasonable performance is an engine that will turn a 12 x 6 prop at 11,000 - 11,500 rpm. This means a .40 or .46 with a tuned pipe or a .60 with a muffler.

Construction

When building any model it is worthwhile taking the trouble to make it as accurate as you can, even if it takes longer to build. If the model is not made accurately it will not fly well and will be difficult to trim, particularly if it is an aerobatic model. Trimming out an aerobatic model is not easy and a lot of pain and anguish can be avoided on the building board.

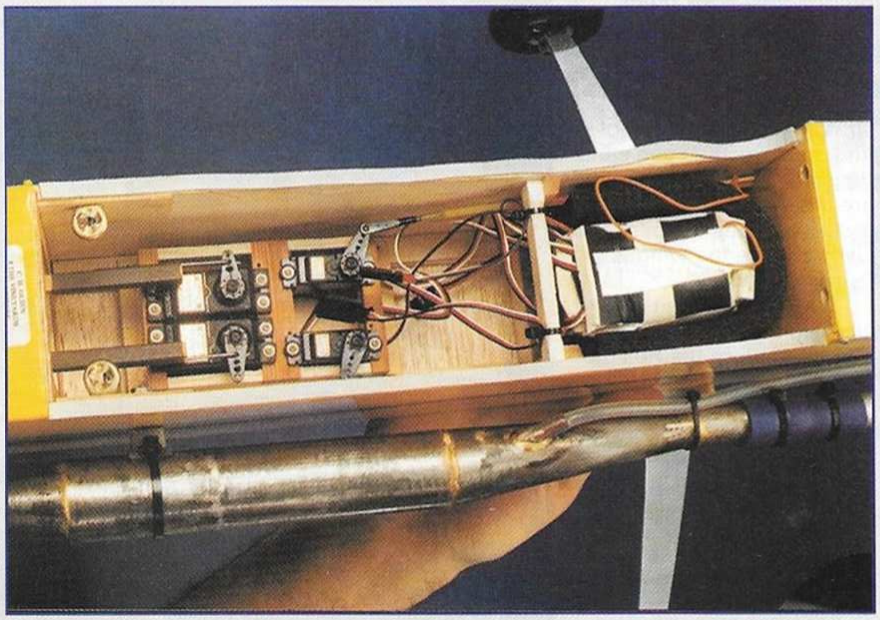
For some years I have been using a system for building models by "making a kit of parts". This means cutting out all the major parts at one time and then assembling them, helping to reduce the time it takes to build a model.

To start with the wing sheeting, you will need to join four pieces of 3/32 in. sheet to make a panel 12 x 31 ins., allowing an extra inch for errors. You will need four panels. To join pieces of sheet balsa together you will first need a straight edge, as most balsa sheet is not straight. Trim both sides of each sheet using the straight edge, then arrange four sheets edge to edge on a flat surface and stick Sellotape along each join. Turn the panel over, open up each join and run a bead of balsa cement down it. When this is done scrape all excess cement off with a wood chisel or similar tool and allow to dry. When dry remove the Sellotape. The Sellotape side will be the outer surface of the wing. Make in the same manner two panels of 1/16 x 6 x 21 in. for the stabiliser.

The fuselage sides can be cut out from two pieces of 1/4 x 6 x 48 ins. but it is cheaper and less wasteful to join pieces of 1/4 x 4 x 36 ins; the join lines are on the plan. To butt join the rear half of the fuselage smear a small quantity of balsa cement on both sides of the joint, let them dry and place them together. Then stick a piece of Sellotape across the joint, this side will be the outside surface. Bend the joint, put some more cement in the gap, lay the sheet down on a flat surface, scrape off the excess cement and allow to dry. This method gives a stronger joint and is called pre-cementing. Make sure that the join angle on each side is opposite to that of the other as shown on the plan. When the sides are finished carefully mark the positions of the formers, servo rails and spacers on the inside surface as you will need reference points when you fit them.

Cut out the fin and rudder and join the two parts of the fin with balsa cement in a similar manner to the fuselage sides.

Cut out all the fuselage formers, wing and stabiliser tips. The wing leading edges are made up from two pieces 1/2 x 3/8" with a piece of 1/2 x 1/16" sandwiched between them so that a 1/8" tongue sticks out for the wing ribs to register on, see plan.



Originally designed for the big and bulky radio gear of fourty years ago, smaller modern equipment fits in with ease.

Full house controls and a powerful, well silenced engine - what more could you want?

The wing spars are made from 1/16" sheet leaving an extra 1/8" on the top. This is done because when the slots are cut the wood tends to bend, then they can be cut to the correct size. The size on the plan has deliberately been drawn slightly smaller so that it does not extend above the ribs.

Make two servo boxes as per plan, the length may vary for different servos.

Cut out a piece of 1/4 x 7/8 x 20 ins. for the stabiliser trailing edge spar and the 1/16" spar in the same manner as the wing. The elevator is cut from 3/8" sheet.

Before cutting out the wing and stabiliser ribs it is useful to make ply templates as this makes cutting out the ribs much easier. When you have cut out the ribs, stack them together with pins making sure that all the slots line up. This is most important as the wing will not be straight if the slots do not line up correctly. Then sand the stack so that all the ribs are the same. The slots for the servo leads are easier to cut out while the wing is being assembled.

If you are going to use a wing jig that uses two 1/4" rods then place the ribs on two 1/4" dowels before checking the slots and sanding the ribs.

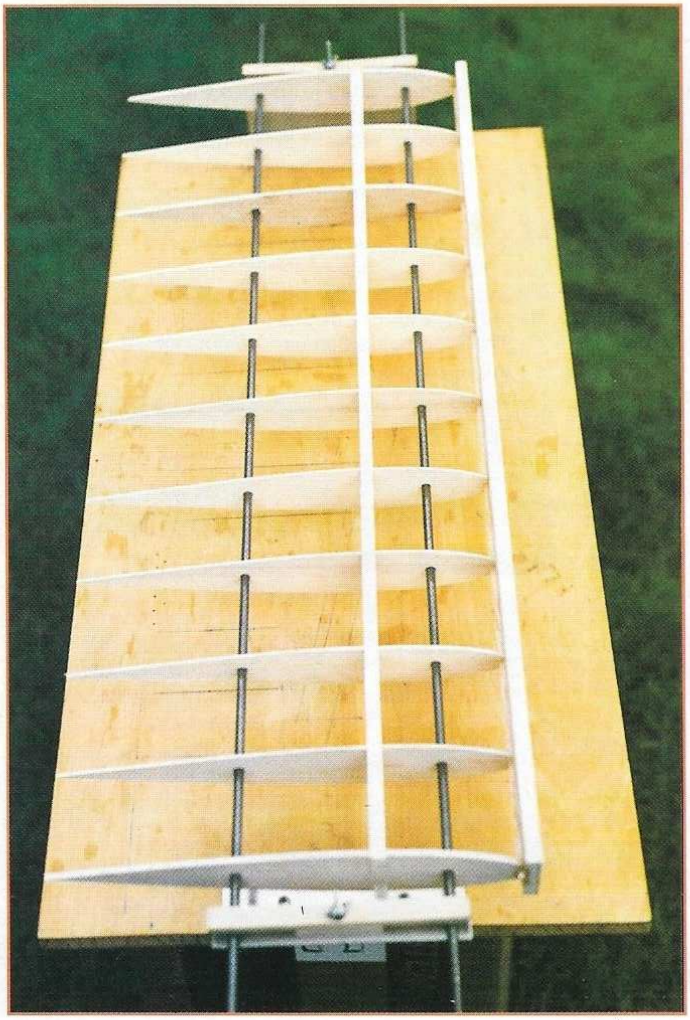
All the wing and stabiliser sheeting and the fuselage sides should be sanded on a flat surface before assembly. The less sanding done on the model the better.

This completes the making of the kit, apart from a few bits and pieces which need to be made up from scrap as you go along.

The plan also shows templates for making foam wings and stabiliser.

Fuselage assembly

If you have a fuselage jig now is the time to use it. If not lay one fuselage side on a flat surface and carefully tack F2 to the side using cyano, making sure that it is vertical and not overlapping at the bottom. Do the same with F4 then turn the side vertical so that the bottom of the formers are resting on the surface, then tack the other fuselage side to the formers. Check that both sides are touching the surface and that everything is square. If so glue them firmly. Glue two pieces of 1/4" to the sides where F3 is marked and two pieces of 1/4 x 1/2" across the sides as per plan. Fit the servo rails, pull the sides together at the nose and stick with PVA. If the two sides are the same length leave a 1/16" overlap on the right side to allow for side thrust, then clamp and allow to dry. Taper the sides of F6, pull the sides together on either side of it and stick with cyano, making sure that the sides are symmetrical. Fit the plates for the U/C and tailskid. Fit F5 and rear fuselage spacers, sand and shape the formers so that they do not obtrude above the sides. Sheet the fuselage top and bottom using cross grained sheet for the curved part. Fit all the reinforcing around the front compartment. Paint the inside of the front compartment and the front bulkhead with fuel proofer. Fit F2A behind F2 and stick the fin to the rear fuselage.



Building the wing on a wire jig will ensure the accuracy needed for 'straight and true' aerobatics.

Wing

The problem with symmetrical wings is that they can not be built on a flat surface without some sort of jig, the most suitable being the type that slots the ribs on to two rods. If you do not have one of these then one will have to be built as shown on the plan. If you have a wing jig now is the time to get it out. Holes are marked on the rib template for the type that has two 1/4 in. rods.

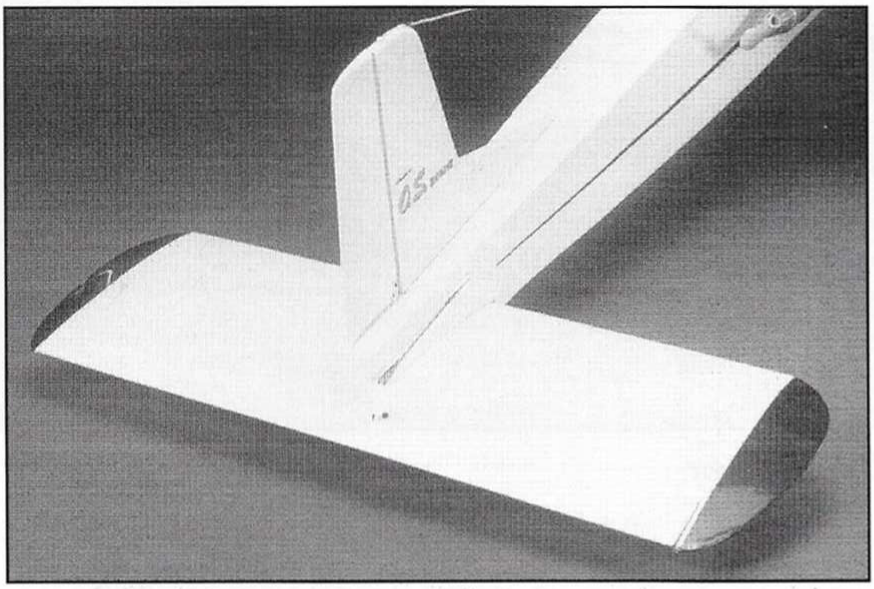
To make the jig you need four pieces of 1/4 in. sheet balsa scrap, shaped as shown on the plan, one piece of 1/2 x 3/8 x 30 ins. and one piece of 1 x 1/4 x 30 ins. hardwood. Screw the 1/2 x 3/8" piece to the building board, stick the four pieces of balsa to the piece of hardwood 10 ins. apart, then tack this to the board 10.11/16" from the 1/2 x 3/8" strip.

Before you use any jig it is a good idea to check that it

is level with a spirit level or some similar device. Pin the assembled leading edge to the 1/2 x 3/8" strip, fit the ribs to the 1/16" spar. Remember the wing is built bottom up. Offer this assembly to the L.E. and tack the root and tip ribs, making sure that they at 90 degrees to the L.E. Tack the other ribs to the L.E., checking that the ribs are lined up correctly with a straight edge. Check that the root rib is set at the two degree angle for dihedral and the top of the spar is below the level of the ribs. Glue the ribs to the L.E. and spar, fit the 1/4" spar in the slots and glue. Now cover the wing with one of the 3/32" panels and allow to dry. The panel can be attached to the L.E. with pins. Plastic bags filled with sand, or a similar material, can be used to hold the panel down on to the ribs while drying.

Cut the excess sheet from the wing T.E. so that the chord is 11.3/4 ins. This is to allow for the 1/4" sq. strip to be glued to the trailing edge when the wing half is finished. Turn the wing over and fit the servo box. Mark the position of the servo box on the outer surface of the wing so that you will know where to cut the hole when the wing is finished. Glue a piece of tapered 3/8" sheet between ribs 1 and 2 at the trailing edge as a support for the wing mounting bolts. Remove the 1/8" tongue from the leading edge between ribs 1 and 2 and glue a piece of ply 1/16 x 2 x 1/2 in. to the L.E. to support the 1/4" wing holding dowel. Cut out 1/2 x 3/8 in. slots for the servo leads in ribs 1, 2 and 3 and line one side and the bottom with 1/16 sheet, leaving the top open.

Make a reference mark on the outer surface of the wing outside of rib 4, one inch from the T.E. Do the same on the inside of rib 11. These marks help when you cut out the ailerons. Cover the top of the wing and allow to dry. Trim all excess sheet, glue the 1/4 sq. strip to the T.E. and fit the wingtips.



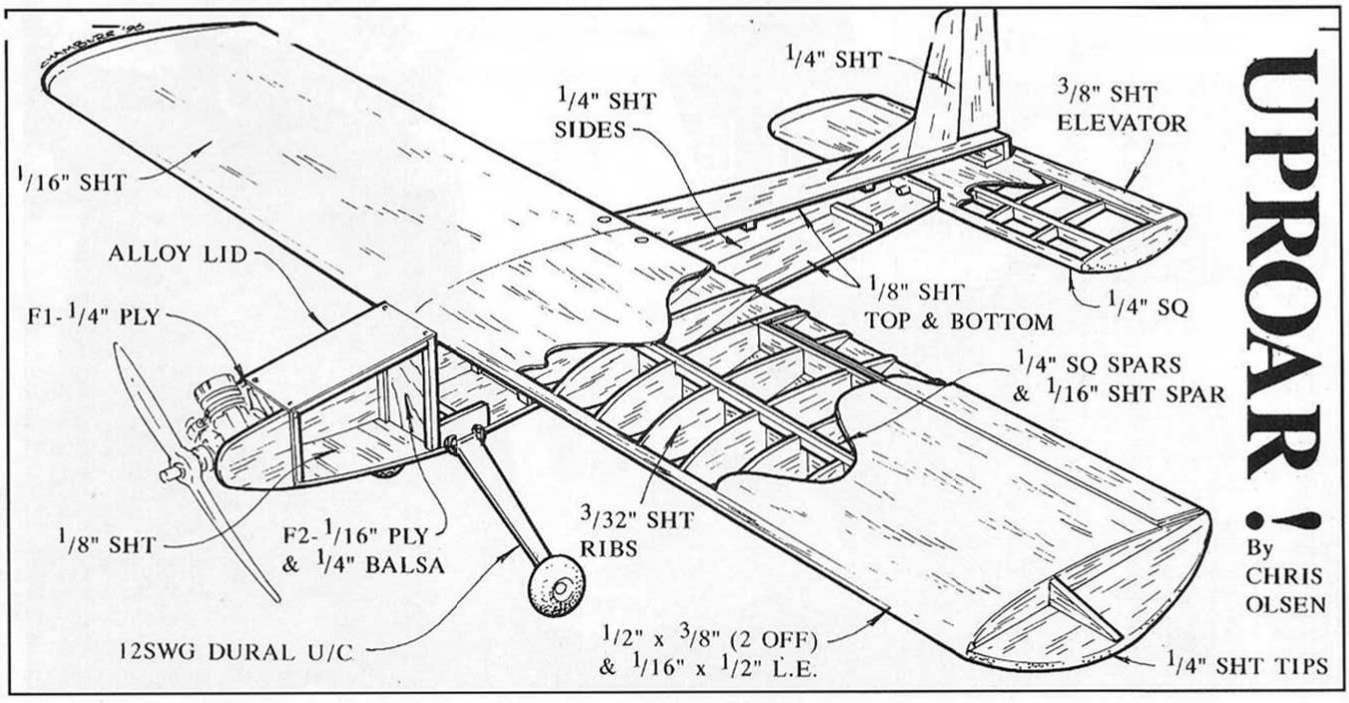
The generous area and lifting section of the tail are distinctive characteristics of the Uproar

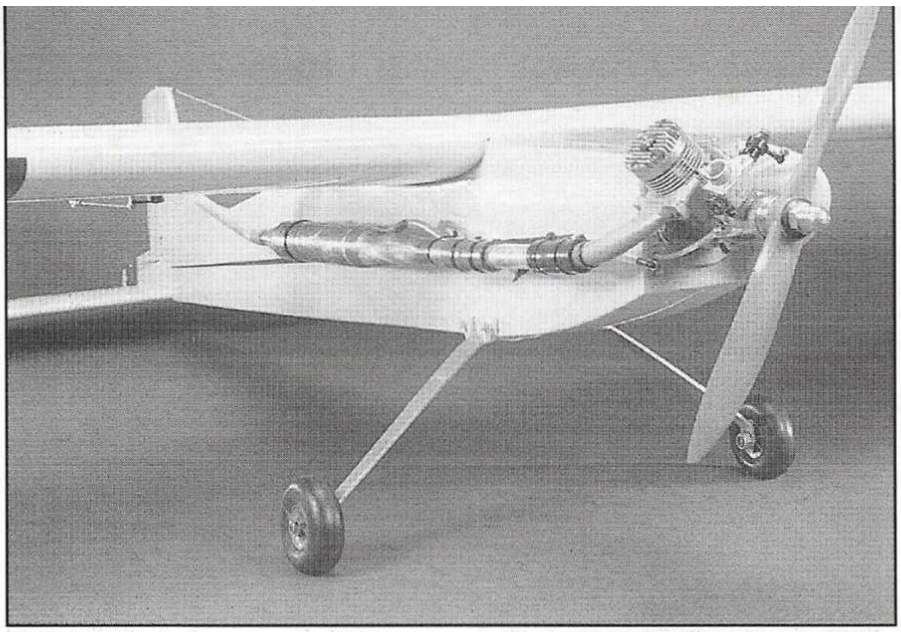
The other half of the wing is constructed in a similar manner, remembering that it must be a mirror image of the first.

When both wing halves are finished, use a razor plane to remove most of the excess wood on the L.E. and T.E. and sand to shape. Sand root ribs and make sure they are flat. Find the marks you made on the under side of the wing, using a square draw a line across the chord about 2 ins. long at each position and make marks at 1.1/4" and 1.3/4". Then cut out the 1/2 x 24 ins. strip. Similarly mark the top surface at 1.3/8" and 1.5/8" and cut out the 1/4 x 24 ins. strip. Saw through the exposed ribs and each end of the aileron. Add the 1/4 in. sheet riblet at each end, cut and sand each face and cover with 3/32 in. sheet. Sand the sheet so that it is flush with the wing surface. Sand the ends so that the aileron is 1/16 in. shorter than the gap.

Cut holes in the bottom surface of the wing where the other marks are for the servo boxes. Cut a hole 1/2 x 1" in the bottom of the wing at the root to allow access to the servo leads.

Cut two pieces of 1/4 in. dowel, 1/2 in. long and glue them into the jig holes. Fix one wing to the building board, then fit the two wings together. Pack up the wing to give two degrees of dihedral, 2 ins. above the board at the tip and check that you have a good fit. If so glue the wings together and allow to dry. Put a 2 ins. fibreglass and epoxy bandage around the centre section.





A piped OS 46 SF provides more than enough poke to enable Uproar to fly the latest aerobatic shedules.

Stabiliser

The stabiliser is built in a similar manner to the wing. The jig is made by using the rear spar as part of the jig, the centre spar rests on a strip of 1/16 in. sheet while the top is covered, then when the panel is turned over the 1/16 in. strip is removed and the panel rests on the sheet covering. Shape and sand the elevator so that it is 1/16 in. shorter than the gap.

If the jig with two rods is used the method is similar to that of the wing.

Covering

This model being mostly straight lines is tailor made for covering with film. I use the polyester variety as it adds strength to the structure and is more resistant to dings.

Finishing

When the model is covered put saddle tape on the wing seat, place the fuselage on a flat surface and carefully align the wing on the seat. Then using a 1/4 in. drill pushed through the holes in F2 start a hole in each half of the wing. Remove the wing and finish drilling the holes. Sharpen two pieces of 1/4 in. dowel with a pencil sharpener. Put a small amount of glue on the point and carefully push it into the wing until it touches the spar, check that the dowel is lined up correctly and push hard so that the pointed end goes into the spar. Put some cyano around the dowel at the L.E. and repeat with the other dowel.

Fix the threaded blocks for the wing mounting bolts on the pieces of 1/16" ply, making sure that they are at 90 degrees to the top surface of the wing at the T.E. Stick them to the fuselage sides and clamp. Measure where the holes need to be on the wing and drill them. The stabiliser is treated in a similar manner.

With this type of model it is necessary to rotate the engine axially so that the exhaust system is clear of the fuselage. So mount the engine on the mounts you are going to use and attach the exhaust system to the engine. The angle that the engine is attached to F1 will depend on a number of factors - size and type of engine, exhaust system and mounts - so it will be necessary to juggle the lot around until the mounts are approximately in the centre of the bulkhead; the angle is not very important. This is best done with the fuselage vertical.

If using a muffler or mini pipe, try to get that as low as possible to avoid getting too much of the exhaust on the wing. If using a tuned pipe and soft engine mounts make sure that the pipe is at least 1 in. below the wing as they tend to move quite a lot during manoeuvres. Mark the position of the engine mount and pipe support. Remove the engine from the mounts and fit them to the bulkhead.

Fitting the fuel tank is not critical but if possible the centre should be about 3/8 in. below the needle valve.

The instalment of the radio equipment will, to a certain extent, depend on how much the engine weighs. If you are using a servo tray fit the servos to the tray, screw the tray to two 3/8 x 3/8 x 3 ins. hardwood and put the assembly on the servo rails. Put the receiver behind F2 then move the servos and battery about until the model balances about 3.1/4 ins. behind F2; the wing is not needed for this. When a satisfactory position is found, glue the tray in position.

The undercarriage shown on the

Chris placed second with this Uproar at the 2nd R/C World Champs back in 1962

plan is the type that I used on the original model and I still use. It is made of a dural alloy known as L72. Most modellers will not have access to this type of material or the tools to make it, so it is suggested that one of the many commercial U/C's is used. Do not screw any U/C to the plate as the first hard landing will tear out the plate. Use rubber bands; they may be old-fashioned but do work well.

I have always used an aluminium lid to cover the top of the front compartment. The access to the tank and plumbing is useful, although a piece of 1/16 in. ply would be just as good. However do not allow anything in the front compartment to rely on the lid to keep it in.

Holes are shown for dowels to allow the use of rubber bands to be used to hold on the wing and tail. There are many good reasons for using rubber bands on this type of model but for some reason they seem to be out of fashion.

Flying

The amount of movement on the control surfaces is as follows:

Elevator	+/- 3/8"
Rudder	+/- 1"
Ailerons	+/- 1/2"

Check that the C.G. is about 3.1/4 ins. behind the leading edge. It can be farther back but it is advisable to start with it the stated position. If you have the means to check the rigging angles it is a good idea to do so. The wing should be at +1 degrees and the stabiliser 0 degrees. The engine thrust line will depend on the power of the engine; a good starting point is 2 degrees down and 2 degrees right. If all these things are correct, the model should fly off the board.

Finally when you start trying more advanced manoeuvres, remember there is no substitute for altitude.●

Tweaking the needle before competing for the 'King Of Belgium Cup' in 1958 at Darmstdat, Germany.

List of wood

1 sheet	1/16 x 12 x 12"	ply
8 sheets	1/16 x 4 x 36"	balsa
12 "	3/32 x 4 x 36"	balsa
3 "	1/8 x 4 x 36"	balsa
4 "	1/4 x 4 x 36"	balsa
8 pieces	1/4 x 1/4 x 36"	
4 "	3/8 x 1/2 x 36"	

Weights In ounces

All in ounces

	Uncovered	Covered
Fuselage, Fin and Rudder	15.4	18.0
Wing	15.2	18.4
Stabiliser	2.4	3.2
OS 40SF pipe, tank and mounts	23.2	
U/C and wheels	5.0	
Radio	13.2	
Extras	7.0	
Total	**88.0 (5.1/2 lbs.)**	