

# SKYBUSTER



## MIKE WHITE GUIDES US THROUGH THE CONSTRUCTION OF HIS FUN-FLY MACHINE

*The tailplane is always the bit that gets in the way when transporting model aeroplanes, so why not make it detachable?*

**D**o you remember those days, about two hundred years ago, when we were kids and had real fun with our model 'planes? Well, I've found them again with 'Skybuster'. Yee-Ha!

In truth this really is a big fun model. With over 900 square inches of wing area, a loading of 12 - 13 ounces per square foot and with a .60 engine doing the work, it will go straight up almost forever. It's fairly cheap to build for its size, it's one piece and the overall performance, slow or fast, will satisfy even the most demanding hot dogger. You can fly it as fast, or as slowly, as you want. Take it up high, power down, drop some flap and, if you are lucky, even catch a thermal - true! Fly some aerobatics, while still gliding, that works too. In a 10 - 15 knot wind you can even fly backwards, not tail first, but backwards - you know!

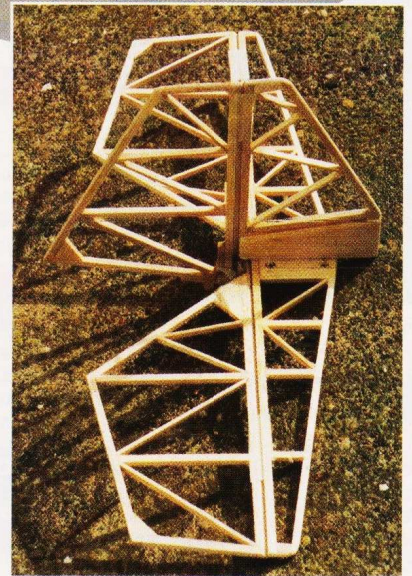
On its maiden flight Skybuster came around onto the approach at the end of the first circuit and 'bang', the starboard half or the tailplane disintegrated. I thought that it had been fired at by the farmer with a 12 bore shotgun. Luckily, the remaining half was the piece holding the elevator control horn. I landed P.D.Q. I can tell you. When I was doing the repairs I found that the remaining half was also broken and was only being held together by the Solarfilm covering. So, modifications now include a removable tailplane section as I think damage may have occurred getting the model into and out of my Citroen BX. Just in case the original built-up construction was not up to the loads put upon it a part sheet balsa tailplane is now used.

Performance with a .40 engine is more like that of the true lightly loaded fun model but does require more flying finesse. I should also say at this point that Skybuster is not for the beginner and requires a flier adept with an aileron model, as the roll rate is quite high even on low rate. My previous two smaller models of the type, 'Peppersprout' and 'High Five' were a compromise between those and the normal high performance sport aerobatic models. As the wing area increases it is easier to control the weight and therefore keep the wing loading down. On the prototype model I fitted a little used Super Tigre .60 engine, circa 1975, which I suppose is approximately equivalent to a modern Schneurle ported engine of .45 capacity. With the Super Tigre I can do a rolling loop of 10 - 12 ft. diameter. It does this quite easily and I only use a Futaba Skysport transmitter, not one of the super computer types - one day though, one day! With a computer tranny almost anything could be flown as so many control surface combinations may be dialled in. With my Skysport tranny I am frequently flicking switches - sometimes the wrong one and often I forget which combination I have selected with hilarious results.

Some suggested control surface combinations for computer radio users, would be:

### **Flaperon:**

- Where, with low throttle, some up flap is automatically set (about 1") which will bring the model down very quickly for rapid touch and go manoeuvres.
- 1" down flap set for maximum glide time from a specific motor run time.



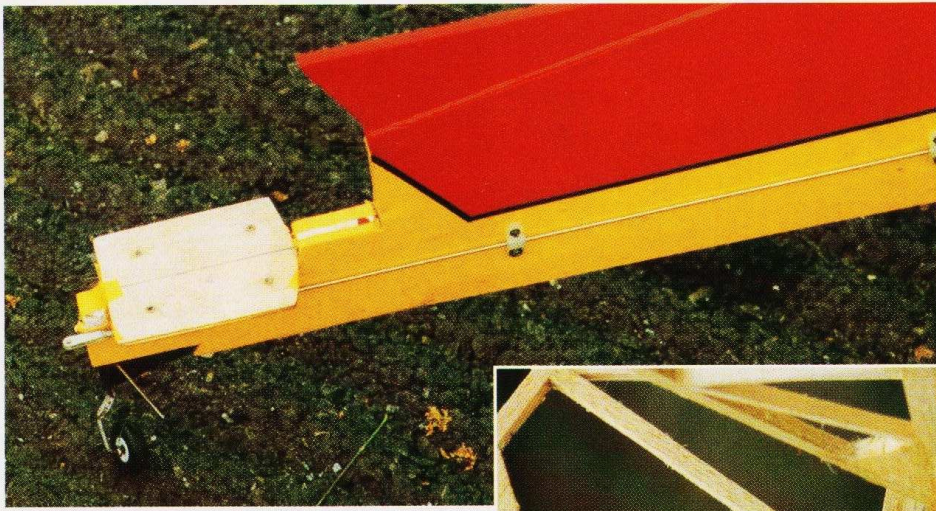
### **Flap and elevator mixing:**

- 1" down flap, or more to suit, with up elevator selections, rates off, for very small loops.

### **Aileron and elevator mixing:**

- Where with right roll demanded from the aileron - i.e. right aileron up, the elevator half on that side goes up and the other down. This requires that each elevator half is separate and driven by its own servo - your mod.

Control surface movements given are start points only and may be adjusted to suit your experience or requirements as can the balance!



As the elevator is large and the balance point is well forward, the elevator response is smooth but very positive. Aileron response is fairly fast, even at the minimum throws suggested, so for your first flight I would suggest reducing them to 75%. Do not reduce the elevator throw though - it's not over sensitive and will be required for the round-out on landing.

I have not flown the model with the balance point aft of that shown. Well, I have but I'm not telling you so! These models need to be very positive to control and not at all twitchy. If you like it to be more responsive then by all means move the balance aft in small increments, reducing the elevator throw if necessary, until it becomes uncomfortable to fly, then move it forward to the last point.

So then, any good .40 to .60 engine will fly 'Skybuster'. A .40 will produce beautifully slow figures. On the other hand a .60 will give almost unlimited pulling power, will go up almost forever and will do aerobatics on a very low throttle setting - quiet too - and if you're one of the clever chaps, it will make hovering easy (I'm still working on that one). Low pitch props are the ones to use for these slow flying manoeuvres. I wish the prop manufacturers would produce their wares in the range of 12 - 14" diameter with 4" pitches for these slow models. They haven't, have they?

So, to the building then. Do read this section carefully because the sequence is quite important.

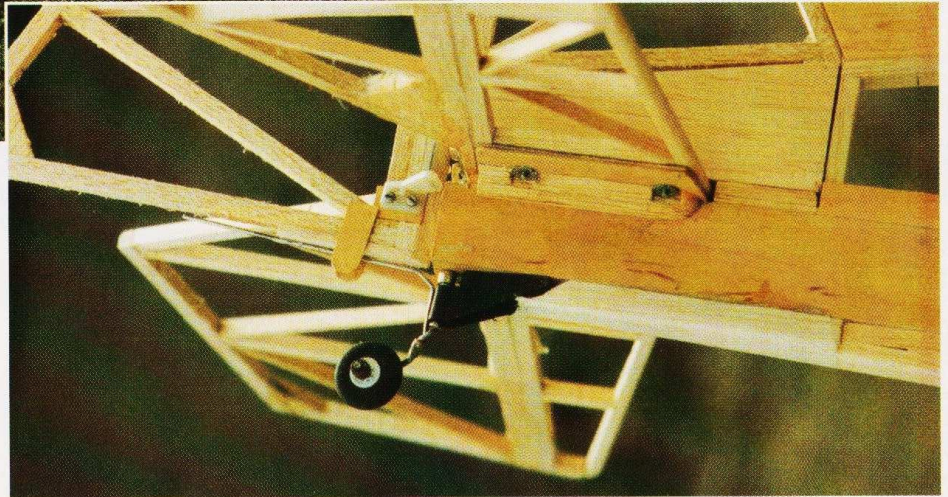
## FUSELAGE

The spine of this unit is built from spruce, ramin or pine longerons sandwiched between ply. They should be degreased with thinners and the ply lightly rubbed down with sandpaper before assembly. With the half inch sheet balsa at the nose glued to the longerons the distance across them must equal that between your engine bearer lugs. This distance may be adjusted to suit your engine dimensions by the addition of a spruce spacer placed between the longerons and engine bearers. Glue on the engine bearers and then the polystyrene foam between the longerons.

you don't want to cut out all those different shaped wing ribs you could always build the wing without the sweep back on the leading edge. If you decide to go this route, use the root ribs for the lot. Go on, put something of yourself into the machine.

## WING

The wing is built in two halves directly over the plan. Lay the bottom spar over the plan and glue on the ribs.



Alternatively use very soft balsa sheet. Pin down over the plan to set.

When ready, cover both sides with 1/16th ply, weigh down or clamp and leave for at least 24 hours. Build the remaining balsa parts of the fuselage but do not glue in place yet.

You might not like the fuselage outline - so why not change it for something a little more curvaceous. While we're on the subject of change, if

They may be laid down with the straight section aft of the main spar, directly onto the plan. Fit the top spar, leading edge and false trailing edge and then add the leading and trailing edge sheeting and cap strips. Omit the top centre section sheet until the wings and fuselage are glued together. When ready, turn over and pin down again making sure that you have not built in a warp.

## DATAFILE

<b>Name:</b>	<b>Skybuster</b>
<b>Designed by:</b>	<b>Mike White</b>
<b>Aircraft type:</b>	<b>Sport / fun-fly</b>
<b>Wing span:</b>	<b>54" (1372 mm)</b>
<b>Wing chord:</b>	<b>19.1/4" (root)</b>
<b>Wing area:</b>	<b>938 sq. ins.</b>
<b>Wing section:</b>	<b>Symmetrical</b>
<b>Dihedral:</b>	<b>0°</b>
<b>All-up weight:</b>	<b>5 lbs (with ST .60)</b>
<b>Wing loading:</b>	<b>12 - 13 oz / sq. ft.</b>
<b>Fuselage length:</b>	<b>53.3/4" (1365 mm)</b>
<b>Tailplane span:</b>	<b>25" (635 mm)</b>
<b>Tailplane area:</b>	<b>144 sq. ins.</b>
<b>Fin height:</b>	<b>9" (228 mm)</b>
<b>Engine range:</b>	<b>.40 - .60 two-stroke</b>
<b>Fuel tank:</b>	<b>8 - 12 oz</b>
<b>Required No. channels:</b>	<b>4 (5 servos)</b>
<b>Control functions:</b>	<b>Rudder, elevator, aileron, throttle</b>
<b>C of G:</b>	<b>4.5 - 5.5" (measured at root)</b>
<b>Elevator throw:</b>	<b>1.5 - 2.25"</b>
<b>Aileron throw:</b>	<b>1.5 - 2.25"</b>
<b>Rudder:</b>	<b>2.5"</b>
<b>Side thrust:</b>	<b>0°</b>
<b>Down thrust:</b>	<b>0°</b>

## BUILD MATERIALS

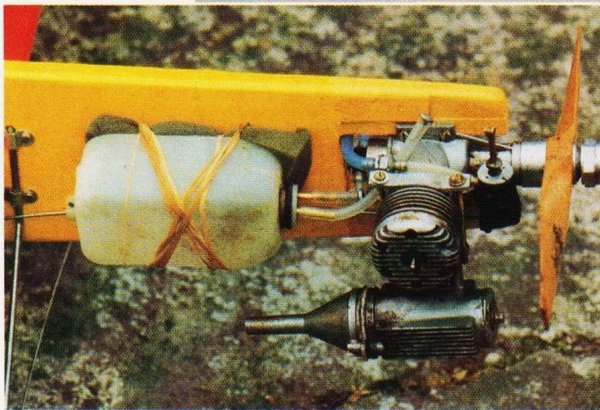
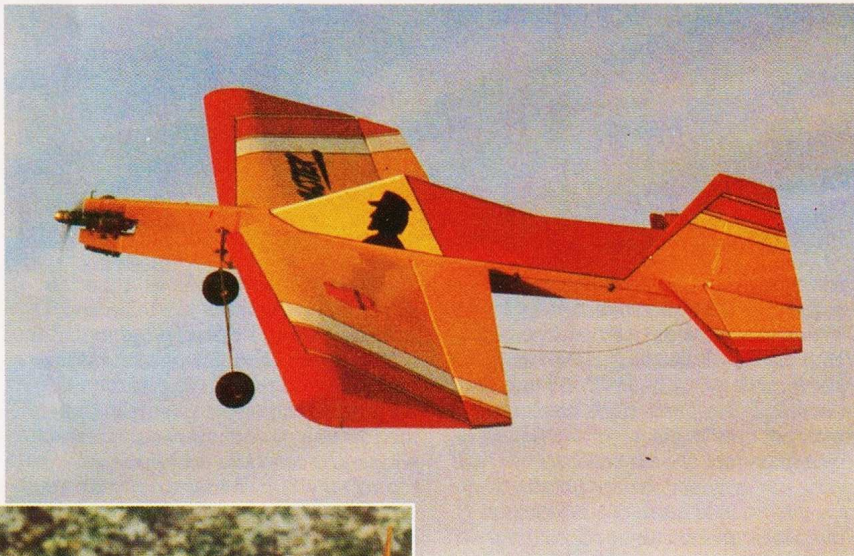
<b>Fuselage:</b>	<b>Balsa, spruce, ply and white foam</b>
<b>Wing:</b>	<b>Balsa (built-up)</b>
<b>Tail:</b>	<b>Balsa (built-up / sheet)</b>
<b>Covering:</b>	<b>Solarfilm</b>



(ABOVE)  
Tailplane damage  
after the minor  
mishap on the  
maiden flight!

Whatever you do,  
give it a high viz  
colour scheme  
and don't forget  
the sinister  
looking character  
in the cockpit?

(TOP RIGHT)  
Not so sinister in  
real life thank  
goodness! That's  
quite some flying  
site you've got  
there Mike.



(ABOVE)  
Mikes little used  
but ageing Super  
Tigre .60 gave  
Skybuster the  
urge it needed for  
all the usual fun-  
fly manoeuvres.  
Probably  
equivalent to a  
modern Schneurle  
ported .45 says  
Mike.

Glue on the remaining sheeting, again omitting that for the centre section, all gussets, servo bearers and main spar webs.

When both wings are complete, join using the spruce and ply doublers at the centre. Note the space between each wing root rib which must provide a sliding fit for the fuselage. This operation results in a pretty large piece of model to manipulate around the work area which, incidentally, should be kept tidy so that you have enough space to prevent that work bench acne which I manage to get on most of my models before I cover them.

Put a generous coat of PVA or aliphatic glue on the inboard face of each R1 rib

and the corresponding section of the fuselage spine assembly. Slide the spine, tail end first, into the gap at the leading edge between the R1 ribs and push home as far as the wing main spars. Set the wing rib centreline on the datum's previously marked on the fuselage side (I nearly forgot that part!). Clamp the ribs to it, clean off the spilled glue and leave aside to set. Next, glue on the 1/16" ply tailplane seat. To ensure that it is horizontally in line with the wing, lay a rule across it and while the glue is setting, keep it in line with the wing trailing edge. Now glue on all the fuselage balsa parts previously made and the liteply cheeks which run from behind the engine to just aft of the wing leading edge. Complete with remaining wing construction.

#### TAILPLANE

This is a simple unit requiring only good workmanship to ensure a solid job. Build the fin and rudder and glue onto the tailplane.

If you have a large car or van then it may not be necessary to have a removable tailplane. This makes a very large one piece model and is the very devil to shoehorn into a car if the space is at all limiting. So beware.

Better safe than sorry and build it as a removable unit if you have any doubts. More often than not, it's not the wing that's difficult to position but the tail bits.

Temporarily hold the tailplane onto the seat with rubber bands and adjust to a square position by trammelling. Now drill down through the tailplane and ply seat for the holding screws. Use tee nuts under the seat.

#### COVERING

I used Solarfilm with scrap pieces for trimming. Design the colour scheme so that you can easily and very quickly, see up from down. All control surface hinging is of the continuous film method. Cover the fuselage up to the wing leading edge, paint and fuel proof the nose area and then cover the wings.

#### BALANCING

Fit the tailplane, all of the radio gear, undercarriage, pushrods and anything else which goes to make up a whole model. Temporarily tape the engine in place on the bearers and check the balance. If it is incorrect move the engine until it is. Drill the bearers and then bolt the engine in place.

#### GOOD LUCK

With a .60 engine up front, no wind and using a 12 / 13 x 6" pitch prop, Skybuster will be up and away almost instantly. Using a .40 and an 11 x 4" prop it will take a little longer. Until you have experience with the plane do not hold the tail down but let it rise and hold it level on the elevator.

If you hold the tail down it may get airborne in a nose high attitude with a low airspeed and could be difficult to handle. Try to do your aerobatics close in, low down and as slowly as possible. Slow figures really do look best.

If you have any questions about building or flying the 'Skybuster' please feel free to phone on: 01624 813654 (evenings until 10 pm) or write, enclosing a stamp only to: 12 Cooil Breryk, Ramsey, Isle of Man. IM8 3HJ. A photo of your model for my workshop wall would be much appreciated. Please someone, anyone?

