

BUBBB

**Dereck Woodward
goes wide-eyed
and tailless with
this 40" sportster**

I can tell when inspiration is striking. Being an inveterate doodler means projects are detectable well before they leap from imagination to reality. So when tailplanes went missing on the sketchpads – something was afoot, so let's give it a hand (groan)!

Commonsense shelved the scale tailless while experience was gained. So, exhume 'Little Special's remain from the attic of remembrance and salvage the wing – intact after the crash. Let's hear a cheer for light wooden structures.

For days I slaved late into early evening. The design centred on a sliding servo tray

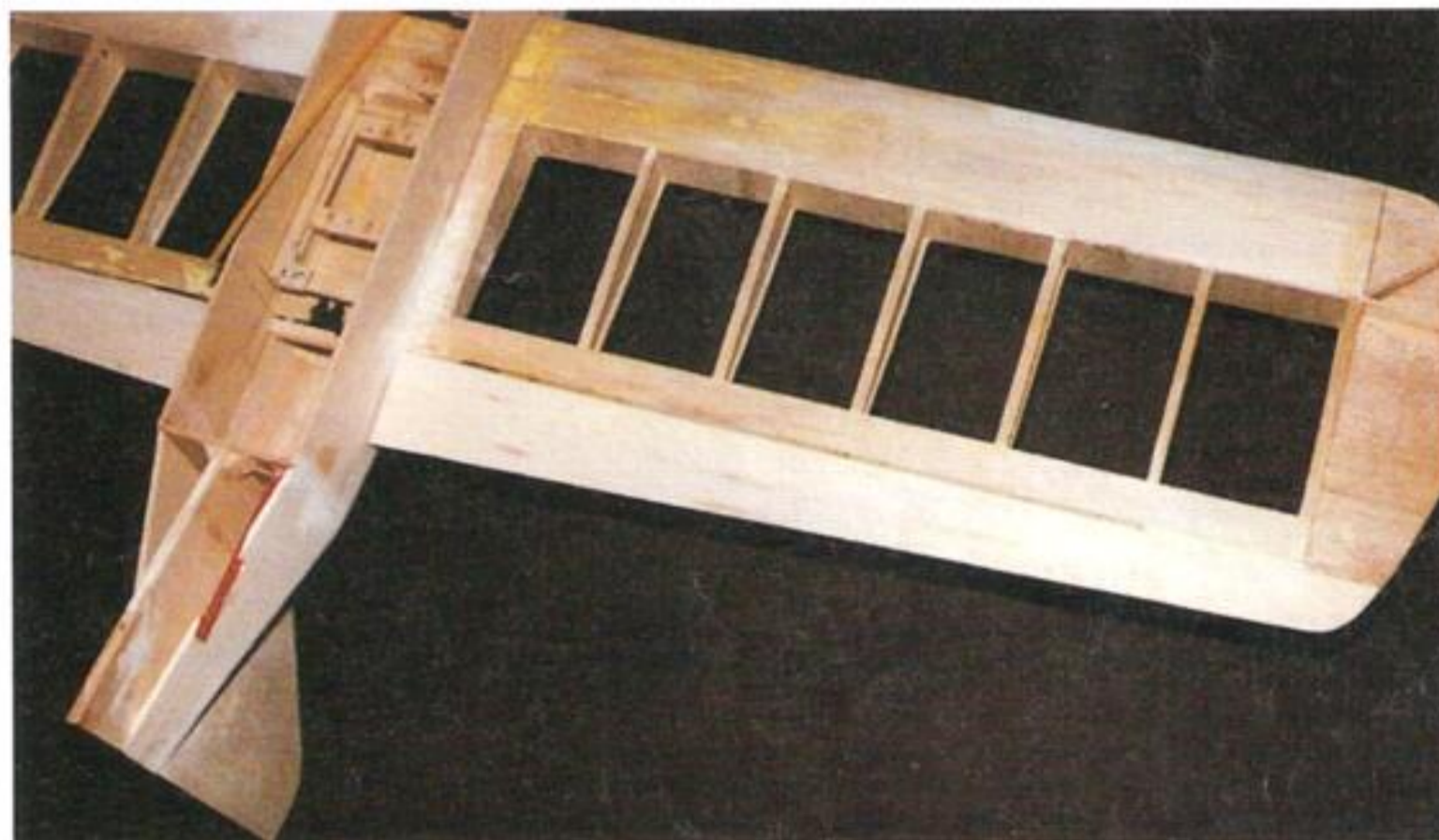
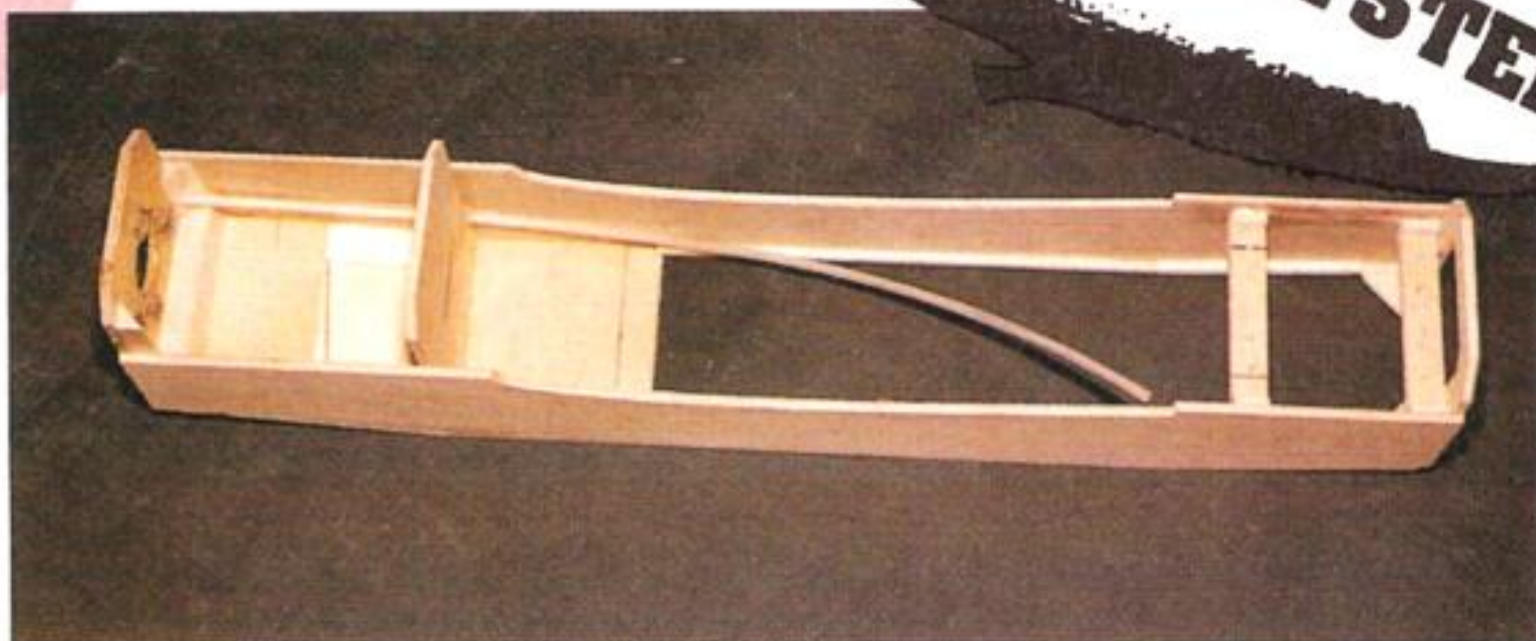
inside a box with a fin on the back. Messrs Simmonds and Whitehead helped place the c.g., empirical design the elevon area, engine the nose length. Styling added a canopy, a handy undercarriage won a bit-part keeping the prop out of the dirt. For once I made the parts before building, so the plan related to the model. Covering involved an unusual holiday souvenir – a roll of American covering film. If a tailless doesn't grab interest – a pink one will!

To the field!

A checkout proves it works so off to the field on the nicest day for a while. Unlike many, forced into test flying, I find the urge to fly irresistible. So start up, out on the strip and open up – she rotates smartly onto the prop! Perhaps Dereck's universal uc position isn't really. Restart, brief 'volunteer' for hand launch – at least Dave knows it'll go away from him – a mighty good heave and she's away. The laws of flight decide I'm not guilty and 'Bubbles' climbs out as though she's home.

She needed more 'up', inverted needs down stick – I just accept it. Hey guys – I

**Your Full-Size
TAILLESS
SPORTSTER!**



Top left, servo tray installed in 'Bubbles Mk I' (the shocking pink version opposite!). Built-up wing is straight from author's 'Little Special' design published back in Oct '88. Top right, fuselage doesn't take a lot of building; this is about 80% of it! Above left, fin and underfin are in one piece; 1/16th sheet core with light balsa ribs keeps the weight down and stiffens things up nicely. Above right, yes folks, the all-wood wing is true! This pic shows most of the salient points of an all-timber 'Bubbles' airframe. Right, tail fin attached to rear fuselage former.

BUBBLES

guessed right! It wasn't all roses, ground handling was nil until I moved the uc forward. The flight envelope expanded to spins, snaps, four point rolls and outside loops. The message was clear - she can do anything the big guys can, except quietly. Then the fairy tale ended. One night, when the sight of 'Bubbles' was becoming accepted, the pitch drive came off. Scratch Mark One!

There's no keeping a good 'un down so we cut some cores and built another. So, you want to go with a foam wing - no problems. If you prefer a real structure, the photos show that it was built, not just drawn in the vague hope it might work.

If you fancy breaking out of the mould, your question must be - can I handle one? The first element is your plans building ability. The servo tray must be accurate to avoid friction but there's little else to fret over. As for flying, 'Bubbles' is little different to any fast, fairly neutral model. A question I've been asked a number of times is about orientation. Having flown a delta before, I can guess what's on folks' minds, but 'Bubbles' gives the same visual cues as a

conventional model. The planform on a knife edged pass is something else though!

So, you want to go 'tailless'?

Be radical - read the instructions! 'Bubbles' is easy to build (there's little to it!), but rather than where you build a wing, a tail, a body then fit radio, this one is built in one piece, so all the parts are intertwined. So read through my hints and sort out progress in your mind first - if you're contemplating this one I figure you only need the oddities pointing out anyway.

Let's go!

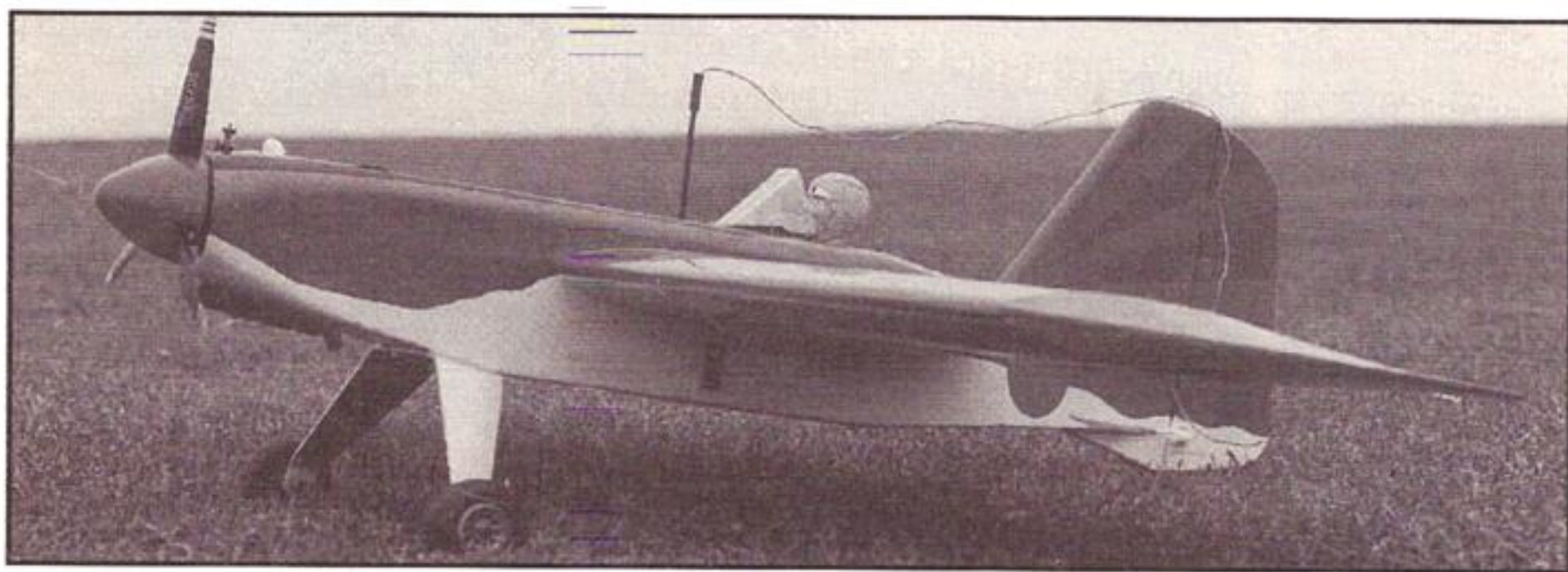
Have to start with the wing. Built-up first, no problems. Cut out the ribs with the aid of a ply template. The cunning lack of dihedral added to the 36in mainspars means you only build one panel. The trailing edge is designed to add to the strength of the wing, so don't go simplifying it and the leading

edge is a good old fashioned 'D' box.

While I'd add the elevons/tip t.e. after joining wing and body, putting the torque rods in now is a good idea. Think deeply here, the radio is installed from the bottom with offset torque rods - there's an opportunity for unintentional transposition. Don't skimp on torque rods, use 10 g. piano wire or something of equal stiffness - those elevons are massive and a weak torque rod is asking for flutter.

The foamy version. A one piece wing means no messy joining. It's easier to box in the servo cut-out before putting the fuselage onto the wing. While you have to cut out the bottom centre-section sheet to clear the servos, leave the top sheet intact. My foamy had l.e. and t.e. sheeting as per the built-up wing with 'capstrips' in the same position. Why use more material than you have to - costs more and wood left off keeps the weight down. Also my foamy looks like it has ribs - have to keep up appearances, what?

So to the fuselage. I used 'Liteply' for the underwing sides with light balsa for the top deck. That was included for a little carve/



'Bubbles Mk II' (above) had a foam wing with imitation ribs; whichever way you build it there's not much to do. Have fun with the colour scheme!

sand exercise, but it could be built with a flat top, a sort of Tailless UglyBoxStik. The formers are Liteply also, apart from F1 which is high grade 1/8in ply.

Noticed that F2 is forward of the l.e.? This was done to give a forward battery position with a SLEC four ounce tank in a separate bay. There should be room for most four ounce tanks, draw it in to check first. If any re-arrangement is needed, keep the prop in the same place and adjust the formers to suit - F2 could be moved back to the wing if necessary. When you've got the fuselage box done, glue onto the wing - make sure everything's square!

Tail feathers - only the fin/rudder to consider. As they're big, I used the scale modeller's beloved core method. Cheaper, lighter and stiffer than big pieces of sheet. So let's join them to the fuselage. Mark a line, vertical to the wing, on the rear of F4 - now mark half the fin's width either side of that line. Still with me? Good, now stick some scrap blocks, 1/4in square or triangular will do, either side of those lines. The fin sits in those blocks and vertical, while you align it in plan. Think it over - it's as quick to do as describe. All that remains is to box in the fin with the rest of the fuselage and the back end is complete, then sand to taste.

Mostly, the bottom is all hatches but there is the u/c to contemplate. A commercial alloy unit is used, the axle position may look well forward but is pretty average in relation to the c.g. If you prefer hand launching, leave the u/c off, but ensure the silencer clears the ground.

I cut out the elevons from 3/8in sheet (ouch!), carve/sand to section then drill and slot for torque rods and hinges, leave the

fixed tip part on for now. Chamfer the l.e. of the aileron bit, offer up to the wing and trim the front of the fixed portion to suit. Alignment is the bottom edge of the elevon root against the top of the lower fuselage side, reflex being imparted by the thickness of the elevon t.e. Happy? Glue up the fixed bit. When set, cut free the moving bits and it should all line up neatly. Now fit the tips, both shapes drawn were used on the prototypes so take your pick.

Balance, guidance and go

I hope you're reading this before you've got a finished airframe! I built the servo tray assembly first and put the rest around it - as the tray has to work freely and reliably, put in a lot of work here. I lost the first one because a snaplink wasn't fastened properly - don't assume - CHECK! Note that the tray is at an angle in the fuselage - this is to avoid bending the elevon pushrods. Own a Tx with built in mixing? Lucky you! Just hooking up two servos, one to each elevon will save space, weight and fuss. Noticed how far aft the throttle servo is? Good to see you're awake. Plan ahead for the throttle snake. At least the rudder pushrod is short though!

Engines - I started with the OS Surpass 26, which gave a cracking performance, Mk 2 had an OS 25 FP two-stroke. People fitting OS 32 FSRs and the like - have fun, don't forget the high 'G' bicycle clips. If you insist on going tailless with a 40 - bombard the Editor with letters on the subject and I'll bow to public pressure.

A tailless with an aft c.g. would have a short, bright lifespan. I have no intention of trying to find out, so play safe. While the

back isn't very far, the big rudder could cause c.g. migration if you use a heavy balsa plank. But you're a good builder and know about these things - don't you?

Better cover it!

Both prototypes used Solarfilm over Clearcote. Forget the heavy stuff - it's as stiff as a builder's plank, hence doesn't need extra torsional rigidity. Be extrovert - Mk 1 was pink with purple wineglass and 'bubbles'. Mk 2 is done up in pre WW 2 Japanese camouflage after discovering that it resembled the almost unknown Japanese tailless "Achi'Tisu Light fighter" designed by Won To Muchisaki, but the resemblance was so uncanny that I had to finish 'Bubbles' Mk 2 like the one faded photo I unearthed.

Whatever, keep it bright and cheerful to stand out in the pits (as if she doesn't already). Cream with green stars sounds one good idea, or how's about a big Union Jack on the wing - not on both sides though, could play havoc with orientation.

Right - let's fly the thing!

This bit's FUN! I told you all about her capabilities in the intro but here's a few extra snippets to cover the differences between 'Bubbles' and the herd.

Take off - start with full up. Ease on the power, reduce the up as speed gathers. Once airborne the acceleration is brisk. The take off process is no sweat, but a touch different - but that's why you built her, isn't it? The short wheelbase gives a choppy ride on bumpy grass, pride and hatred of drag makes me suffer with tiny wheels on my 'Bubbles' - big fat tyres would be better on a grass patch.

Flat out she'll be out of sight quickly, she's only a little model after all. The sense of relief when I made the first turn and she didn't fall out of the sky was something else. You, prospective builder, are relieved of the anxiety - as a conscientious designer I've done the worrying for you!

At the other end, she'll fly quite slowly and safely by getting the nose up and adjusting the descent with power. Which is like it should be with any model, so why am I telling you? Landings can be conducted in a slow and dignified process with all the satisfaction a three-pointer brings.

The stall is an anticlimactic sort of affair. Be prepared to assist spin entry with pro-spin aileron, recover by neutralising everything and it stops. Easy, isn't it? While we're gyrating - the snap roll rate can be, shall we say, EXCITING! She needs ailerons as well as rudder/elevator to snap and spin - I haven't provoked more than a lot of untidiness with just rudder and elevator. While we're waving the rudder about, the stall turn is easy, but there is some yaw/roll couple to watch for.

With little inertia, everything happens briskly so feel your way gently. For example, try an avalanche with three snaps on the top of the loop instead of the boring old one. I'm not saying that this layout is better than a conventional model, but it offers a lot of performance, doesn't look like the rest and requires no different skills than other high performance small models. Go on - be brave and give 'Bubbles' a whirl. With no tailplane to make, it can't take long...

So - LEAVE IT OFF!

