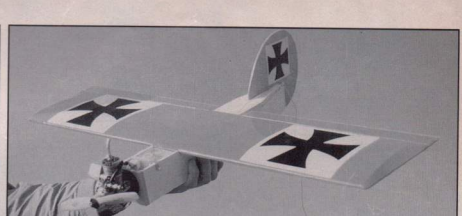
**Dereck Woodward offers 28 inches of tailless excitement for .10 size engines.**



# Little Bit

**Your Full-Size FUN-FLIER PLAN!**

It was embarrassing ! Being at the Old Warden ASP Designs Day with people asking me what I had for Small Models Day – when the 25 powered 'Bubble' tailless was about the smallest model I owned! So, an OS Max 10 of indeterminate age, but sound of bearing and piston was unearthed. The Loft of Remembrance yielded some mini servos and a Rx. Needed – one small nicad – no sweat, make one.

It has been truly said that the most useful tool in Small Modelling, next to a very sharp balsa knife, is the copier with programmable reducing functions. This 'tool' quickly gave a workable drawing for the primary structure of the wing. Helpings of imagination and simplicity combined to produce a 28in span sort of 'Tailless Ugly Stik'.

Test flying turned out routine – forget it looks as though it shouldn't be flying – and enjoy that it is. Well, 'Little Bit' doesn't fly like every other model. Being 'nippy', responsive and vice free means she's more fun than many!

## Board meeting

For once, I made a kit of parts! For the ribs I used the first as a pattern, cut the lot out and trimmed two 1/8in ones and two 1/16in to make the centre ribs. 1/4 x 1/8 hard balsa spars are fine and the trailing edge is 3/8in square with internal doublers to take the hinges, the leading edge is from 1/4in sheet.

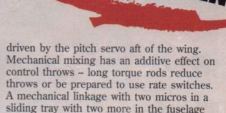
A workable assembly sequence is gluing the lower spar to the leading edge sheeting,

*Dereck tried two engine configurations in 'Little Bit'; here's the O.S. 10 installed.*

then attaching the ribs onto that lot. Pin down onto the board with a 3/16in strip under the ribs as support. Now fit top spar, leading edge and trailing edge and top leading edge sheeting.

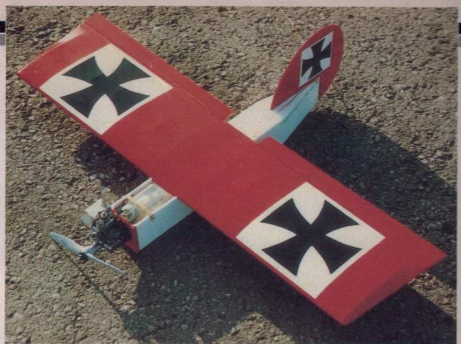
Noticed the gap between the centre-section ribs on the underside aft of the mainspar? This gives the aileron servo the room it needs to operate. Top and bottom LE sheet runs unbroken from tip to tip for strength.

For the ailerons, firstly decide on servo driver and placement. My low-tech solution is on the drawing, with the roll servo slides driven by the pitch servo aft of the wing. Mechanical mixing has an additive effect on control throws – long torque rods reduce throws or be prepared to use rate switches. A mechanical linkage with two micros in a sliding tray with two more in the fuselage will just fit for a four channel version. This would give a fuller aerobatic performance up to spins and snap rolls.



*The flying will amaze you! Looks as though it shouldn't – but it does.*

If you've got the facilities, electronic mixing is the way to go and, allied to micro servos, would give 'Little Bit' full four channel aerobatic capability. But don't let lack of it keep you out of the fun – that



sophistication is icing on the cake.

The elevons are light, stiff 1/4in sheet with a carve and sand exercise. For the true 'Ugly Stik' look, you need to add artistically scalloped TEs! That leaves adding the tips, smoothing it all off and building the fuselage.

## A miniscule number of parts

– When all are together forward of F4 you have a box – couldn't be much simpler. Originally I used an OS Max 10, on a commercial mount, fed by a Sullivan 1oz. tank. A 2oz. tank could be used but would require a longer nose – beware nose heaviness, or you could make up a tinplate tank to suit. Tank retention is bands over dowels in the sides which fits the 'minimal model' philosophy well.

Next, unite wing and fuselage, so make up the fin while the glue sets. Here's an ideal place to use those oddments of 1/8in sheet you've accumulated. The various grains unite to give a stiffer unit than a single piece fin with unidirectional grain. By now, the wing/fuselage joint has set, so add the fin onto F4 – ensure all is square – then on goes the rear fuselage top, bottom and sides. The astute builder will realise that the project is about done!

The servo slider is easy and cheap, but requires accuracy. Ensure everything fits without sticking or grabbing. If this occurs – toss the offending part into the bin and start again, the cost is trivial.

The model will take standard servos, especially if two channel only operation is intended. I used a home-made 180 mA pack of four 'AAA' cells which fits under tank floor F3, as will a 225 pack. A standard Rx fits in the space between servo well and battery, so not owning micro gear is no excuse at all!

## Making 'em wiggle'

I've found good access hatches handy with tailless models – I keep having to remove them, so folk can watch the servo tray move courtesy of the 'pitch' servo, with the 'roll' servo simultaneously moving the elevons. Electronics win on weight and simplicity – but the servo tray is a better crowd pleaser!

That's the 'mystique' of elevons! That leaves the optional throttle. The servo is well aft, so ensure the throttle snake doesn't interfere with anything else on route. Oh well, had to mention it somewhere.

Flight trials proved the OS to be just fine, so I removed the OS and screwed a Cox Golden Bee. 049 onto F1 and made a hatch for the tank bay. With a small amount of 'church roof' (lead!) nailed to the CG, she flew fine at 14 ounces; the three channel OS 10 setup weighed 16 ounces. For the Cox option from the beginning, glue a top cover between F1 and F2 and adjust F3 to make a bay for a 225 pack. May as well use nickel/ cadmium instead of lead for noseweight.

*'Little Bit' and designer with the rest of the gang at our Small Models Day back in May.*

The Cox Golden Bee is fine as regards power, even a Baby Bee would manage a lightweight 'Little Bit' but the one to use would be the Dragonfly with its integral clunk tank. 'Little Bit' is fully inverted and outside loop capable, more than the Cox C/L tank was designed for really.

At Old Warden Small Model Day she won over one modeller, we discussed using an OS 15 FP! The verdict – possible and fast! Enya CX11s, Super-Tigre 11s and such should fulfil a need for speed – or PAW 100/149 diesels will do fine, so most will have an engine that will suit.

## Long finals!

Better hide the gear. The hatch is 1/64in ply covered with 1/8in balsa; sand to match the 1/8in fuselage floor. A ply tongue engages in a slot in F4 rear and corner gussets of 1/8in ply at the front accept small screws to secure.

Covering follows what has now become tradition – Clearcote around the oilier areas, Balsaloc in the tricky corners and Solarfilm to give the air an easy way round. She's red and white for two reasons. One, all true 'Stiks' are red with white squares and black crosses. Two, *Aeromodeller* Editor Geoff Clark was convinced I'd do her in pink and purple. Fooled you, Geoff!

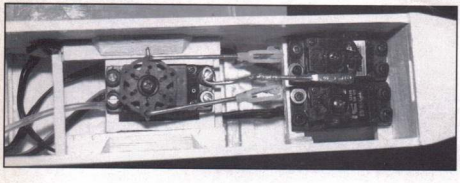
Whatever, make sure that top and bottom are distinctive. I cunningly omitted the markings from the bottom of mine, so 'this way up' is obvious, even at a distance.

## Pre-flight checkout

Setting up control throws is easy when taken logically. Make sure the servo tray is

*And here's the other installation; this time a Cox Golden Bee.*

central with the pitch servo at neutral. If it jams, current drain and your model's demise will be spectacular. Now set elevon reflex, with the top edge of the elevon root being parallel with the fuselage top. How little



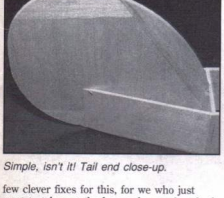
*Aileron servo slides on a simple tray to provide elevon control.*

reflex is needed may come as a surprise, a major benefit of using a symmetrical wing section rather than the more common, drag-ridden reflex sections.

Elevator throw is 3/16in each way, as is roll throw. Set each separately by adjusting the respective servo arm lengths, so you don't affect the other function's throw. That'll do for starters, later you can reset to taste. A tailless tends to be fast in roll but heavier in pitch, thanks to the shorter moment arm compared to a regular tailplane. Did I ever promise you what our American brethren call a 'Cookie Cutter' model? For 'cookie'. read 'biscuit'. It describes a model that looks the same as all the rest. Another expression, courtesy of my lovely American wife Sue, who is bi-lingual (American and English!)

## A slight snag

The receiver aerial is somewhat longer than the model's fuselage. While there are a



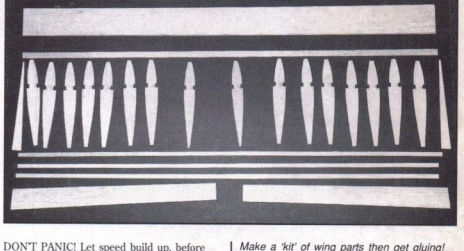
*Simple, isn't it! Tail end close-up.*

few clever fixes for this, for we who just want to take out the box and use – just feed the aerial out of the fuselage top, anchor it at the rear and let it trail in the breeze. Be careful with it though, snapping it off or getting it snarled round things are not recommended ideas.

## So, it all works

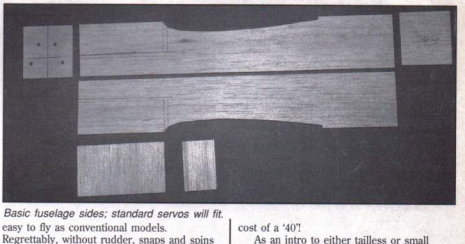
Let's go fly. Firstly, find a volunteer who can hand launch a model properly. Often known as 'aeromodellers', they can get a model airborne smoothly, slightly nose up and at good speed. As she only weighs around a pound, there's little worry over straining anything. Later, you'll find it is easy to launch 'Little Bit' single-handed.

Fire up, put on a little 'up' trim and away. With either engine tried so far, acceleration is brisk. She may sink slightly initially –



DON'T PANIC! Let speed build up, before easing into a climb. Like any aerobatic small model, don't let her get too far away, get used to the look of her in the air and you'll soon adapt to flying tailless.

Looping, rolling and combination manoeuvres are pretty much the same as any other snappy little flier – indeed, most who 'go tailless' soon realise they are as



*Basic fuselage sides; standard servos will fit.*

easy to fly as conventional models. Regrettably, without rudder, snaps and spins are off, especially if she's a tad nose heavy. I have flown her tail heavy, take my word for it being far too exciting for any practical purpose!

She'll fly inverted with little down elevator, but remember that a Cox C/L tank allows few seconds of inverted before 'The Sound of Silence'. With the OS plus clunk tank she'll fly inverted all day – or at least

*Make a 'kit' of wing parts then get gluing!*

## 'Finals'

Someone asked me what this model cost. I was caught out there, but two rolls of film, three sheets of balsa, some ply and the hardware has to be trivial. Even adding the price of a suitable new engine for 'Little Bit' wouldn't push the total anywhere near the cost of a '40'!

As an intro to either tailless or small modelling – or even both – there's little to lose and a lot of fun to gain. Taking advantage of her tight turning abilities I've flown her from some tiny spaces, so any odd patch will do for a flying site, as long as the neighbours don't mind. Another lunchtime session advantage is her being a one-piece model that takes up little car boot space. Go on on, treat yourself!