BUILD FROM OUR FULL SIZE PLANS

CANDICE

A 33" canard sportster for .049 engines and two-channel mini R/C, based on an original 1972 free flight rubber design by Ray Malmstrom – this version by 'Grey'

Do we need to introduce Ray Malmstrom? His fertile mind has created flying devices of fancy over the years and at a splendid rate. 'Candice' is a fairly new 'Malmstrom' from 1972. Despite being a pusher canard, she rates about five out of a score of ten on the off-beat scale as far as Ray's output goes!

There is a precedent

Ray Malmstrom's rubber powered Miss Fliqhty appeared in *Aeromodeller* in the mid '60s. Shortly after, another modeller published a rudder- only 049 powered version, followed by Dereck Woodward's PAW 149 aileron/ elevator version – seen pushing the envelope at Old Warden before Dereck's departure to the USA.

So, in tribute to Ray's genius, I present my slightly scaled up 'Candice'; .hopefully in keeping with Ray's ideals of small, fun and unique models, I kept the size down and a Baby Bee, hardly the most powerful Cox engine, powers her well.

The idea of publication did not occur until Old Warden Small Models Day, 1993. After our first flight, 'Candice' and I were force-marched into the Argus Control Tent and presented to Alec Gee. Alec, being a man of taste, took a look at 'Candice' and asked when the plan would be ready. It's taken long enough, but we're here. Don't just loaf around – find the little wood needed and get going!

Wing (the big one at the back)

All the ribs are drawn, there's not that many, so cut them out first. With the symmetrical section, first glue the ribs to the lower spar then use a length of straight 3/16" under the ribs' rear ends as a jig before adding the top spar, trailing edge etc.

With both panels complete bar the bottom centre section sheet, join them, noting the 3/8" dihedral under each tip. Then add the centre brace and 1/8" fill-in to accommodate the spar sweep angle. The servo box can now be fitted – the smaller the servos used, the better – and fit the torque rods, ailerons and fixed trailing edge sections.

You can buy suitable torque rods – American Carl Goldberg 3/32" torque rods are available here – or make them from 16 g wire and matching tube. The pushrod connector is flattened, drilled for the pushrods and soldered to the wire torque rod. These are light, custom made for the job and, correctly bent, give no differential action. By the way – put the bearing tube on *before* you make the second bend!

Run your sanding block round the structure and, when happy, add the tip plates. These came off the original, naturally. All that remains is to drill the holes for the two wing mount dowels, using the fuselage and F3 as a jig to get the holes spot-on.

Tailplane (the little one at the front)

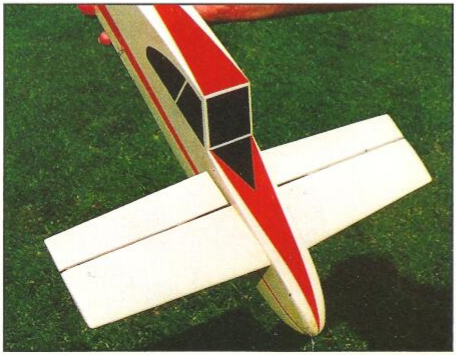
The elevator joiner is still available at enlightened model shops – it's a control-line unit. It allows an internal pushrod which looks far tidier than a dowel joiner and external pushrod. Making one up is easy, as long as the builder can silver solder. Soft soldering is not strong or dependable enough for this critical joint.

The hardvood leading edge will prolong the life of the leading edge's shape considerably for little penalty in work or weight. If you fly off a rough site, you will soon regret leaving it off! Sand to the flat bottomed section shown and that's it. At the size and speed of 'Candice', this fulfils the need for the foreplane to stall before the mainplane. This gives the canard its charming and safe handling in pitch, the foreplane stall causing the nose to pitch down, restoring its own lift and keeping the mainplane clear of its own stall angle.

The fuselage

This reflects Ray's original – it's simple and boxy. Hence it builds fast, too. Little ply is involved and there aren't that many balsa pieces, so cut the lot out and go from there.

The 3/32" sides, from light, stiff sheet, are



Close-up of the foreplane (or 'little one at the front' as Grey calls it); if you can't find the commercial control-line elevator joiner he describes in the text, it's not too difficult to bend one up and silver solder. Pusher engine installation at right is neat and easily accessible. Grey says that if you can't find a pusher prop, no problem. Just fit a conventional 6x3 backwards and run the Cox clockwise. It works!

edged with 3/32" x 3/16" strip as shown. The way to obtain this is with a metal straight edge, a sharp knife and the oddments left from cutting out the sides. Balsa doublers stiffen the wing seat and give extra support for F4. Carefully ensure the rigging angles of mainplane and foreplane are accurately cut and we're ready to join 'he sides with F2, 3 and 4.

Having the sides parallel over those means you can glue them to one side at 90 degrees, then add the other side. When dry, pull in to Fl, add the nose block and drill F4 for the engine and we're well under way. Most Small Model Association non-members mount Cox engines with small self-tapping screws – run them into their holes, remove, a drop of thin cyano glue to harden and fuelproof the threads and you're done. As the engine is pushing into F4, as opposed to pulling, this is fine. However, the cautious may prefer 8BA nuts and bolts.

Now is the time for all good modellers to fit radio and wings – while you can still see everything! Wing first. Band lightly into position and check for fit and alignment. Now use F3 as a template to drill the holes into the wing leading edge. As you left the bottom sheet off, you can drill the trailing edge using the ply plate as a guide. Fit the captive nut, don't forget the tapered wedge under the bolt head to allow it to fit snugly and finish off by gluing the wing dowels in.

Now fit and test the servos. Noticed the cutouts in the wing mount plate? Good – they allow the aileron torque rods rearwards movement. Check that they' re in the right place. The elevator servo is a straight run forward, remembering that the elevator going down *raises* the nose.

The nicad – a 225 or 250 – goes behind Fl for balance purposes. The access hatch ensures that it will never go wrong, Mr Murphy's Law decreeing that inaccessible components play up. Just make and cover the hatch and fix with clear tape – lighter than a screw fixing, easily removable if you need to get in and adequate for its non load bearing role.

The receiver is fitted above the elevator pushrod – ensure that it is clear of all moving parts and the aileron flylead is secure. As a traditional aerial route would lead to a shorter aerial when the engine starts, the routing is out of the 'cabin' roof, to the fin top and hence to a removable wing tip fixture. This is a good point to include in your pre-flight check!

Right – box up the fuselage, make the access hatches and the fairing over the wing centre section. That also supports a big fin; the size is due to its not having the leverage of a conventional model's fin.

If you can stand more hopping about – cover the wing, fit radio and engine and see how the c.g. is coming along. The remaining covering won't make much difference and it's easier to correct a gross imbalance sooner than later, though the prototype came out right as drawn.

Wrap her up

Solarfilm is just fine here – keep it light, no Lead Model Aircraft paint allowed! The trim is

We caught up with Grey at Old Warden during Small Models Day last year; here is with the prototype Candice. Model is Solarfilm covered with Solartrim decoration. Very pretty...

from Solarfilm and Solartrim with a little Clearcote around the seams to protect your pride and joy from the ravages of high nitro fuel.

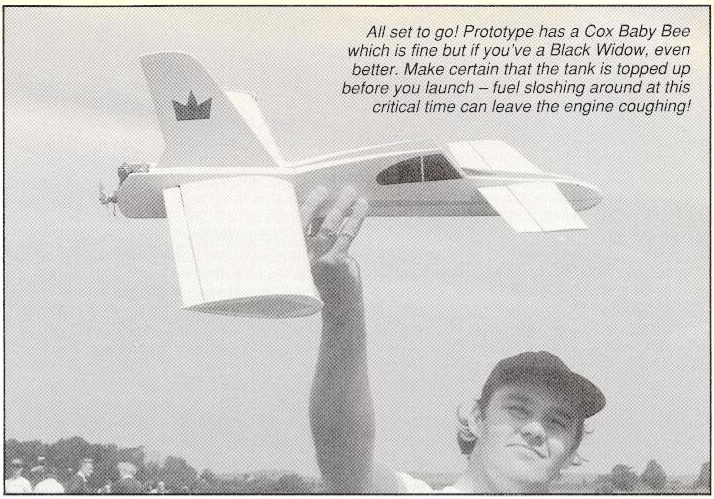
Let's push off

Props – if you can't find a pusher prop, fit a tractor 6" x 3" backwards and run the engine clockwise – they are indifferent to direction. If you have trouble hand starting backwards – the standard spring doesn't work that way and pusher springs seldom cross the Atlantic – an SMA starter can be made from a '540' buggy motor, an electric flight prop driver and silicone tubing over the latter to engage a Cox spinner. Driven by a six cell nicad, this will start a Cox in either direction by reversing the starter's battery connections.

Range check – fine. Controls – 'full and free' and a last check that 'up' means the elevator trailing edge goes down the amount it should. Now you need a hand launch and all your clubmates have vanished! Drag out one who can hand launch a model, explain that a good, level push and follow-through means his hand will be well clear of the prop – you'll even lend him a stout glove if still doubtful! Dereck Woodward did it without a glove, in front of the Old Warden crowd, *and* still had all his fingers intact afterwards.

Let's fly

Fill her up, light the fire and let's fly. These integral tank Cox tanks do work in the pusher configuration on launch as long as they're close to full – if half empty, fuel sloshing around can leave the engine sucking air under the acceleration of a hand launch. So, if she takes a while to go, sort the problem – Cox engines can be full of sticky castor on the first start of the day – fill her up again and away.



All set to go! Prototype has a Cox Baby Bee which is fine but if you've a Black Widow, even better. Make certain that the tank is topped up before you launch – fuel sloshing around at this critical time can leave the engine coughing!

'Candice' with a Baby Bee is not over fast, so relax and cruise around to get used to her looks in the air. A canard is no harder to fly than a right – as opposed to a Wright – way round model, but looks different. Which is why you built her, after all. She will loop as long as she's not too nose heavy, rolls look odd at first but so what? Inverted means you have to persuade the foreplane to a far different incidence angle than it was intended for and, by the time you've got there, the Cox' s lack of an inverted fuel feed will probably make its presence felt.

Timing the engine run will allow you to whiz off to height before the fuel runs out. She will glide back down fine deadstick, the canard's slow speed abilities allow her to be set down accurately with little forward motion. The Baby Bee's tank is a little short-legged – a Black Widow will give more power and a longer run.

Flying (backwards) into the sun

I've tried to transfer the character of his delightful model to radio control and hope I've succeeded. As the R/C 'Candice, flies as easily and naturally as Ray's tiny rubber model did, I think I have. Why not build 'Candice' and introduce a little light-hearted whimsy to *your* flying field? Have fun and could you please take a spare photo for me?

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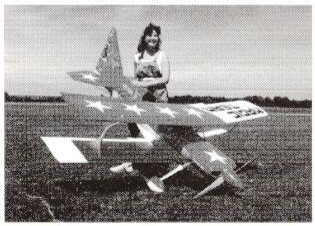

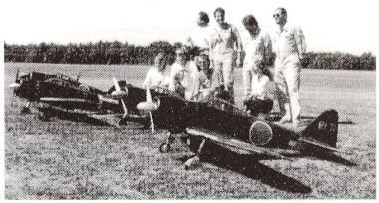

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