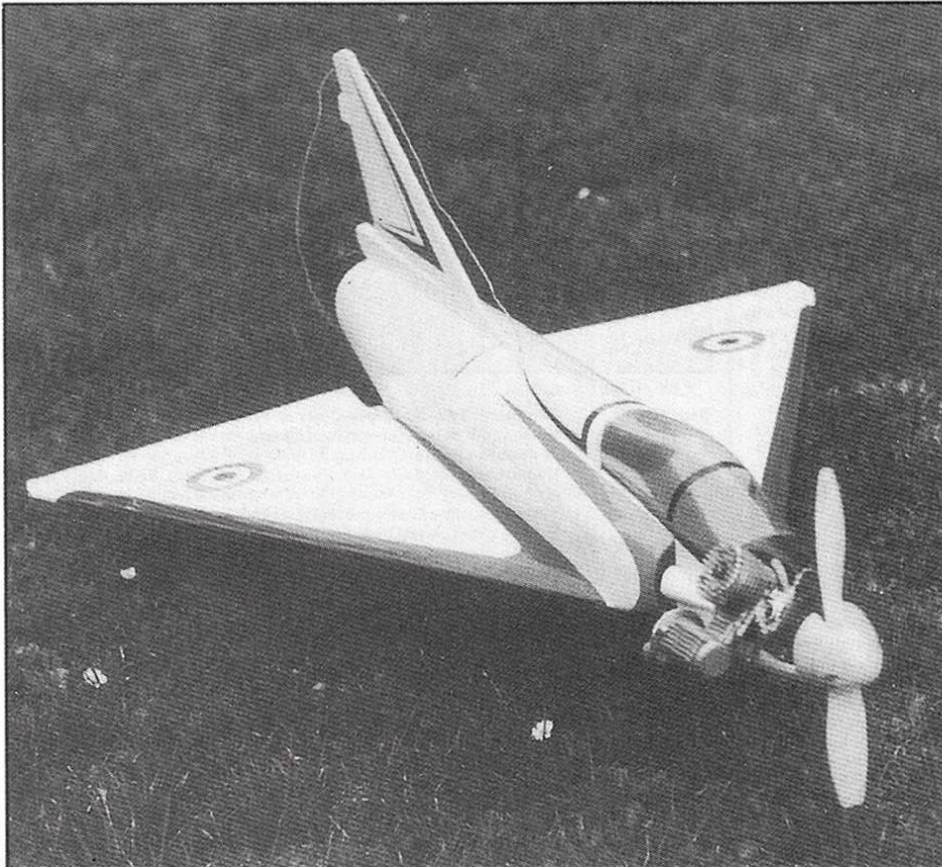


MIR



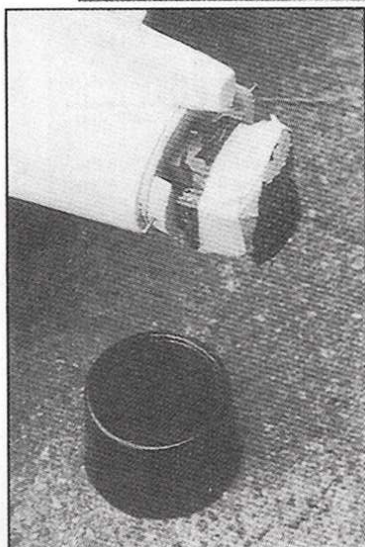
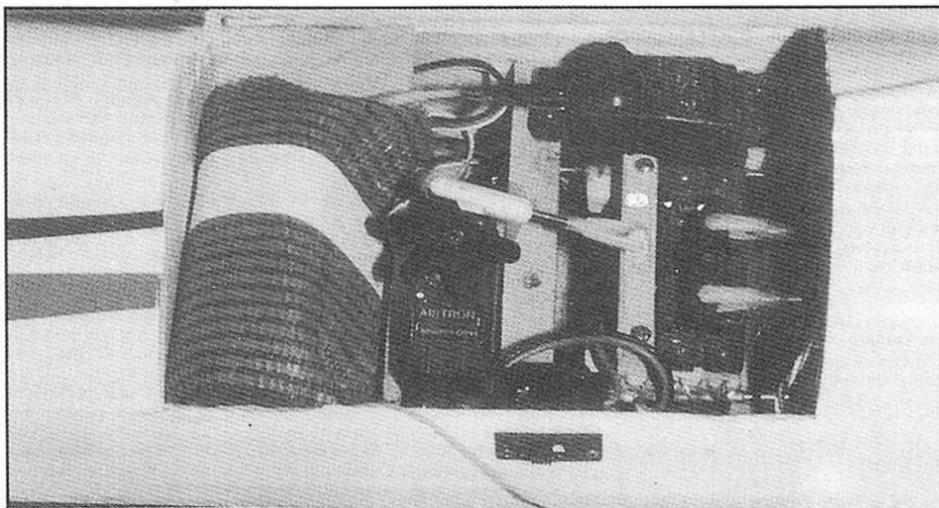
Start construction with a visit to your local DIY shop for a chunk of white foam then proceed to rough out the wing shape and section with a trusty kitchen blade! Prototype was sheeted with balsa but veneer would have been a lot cheaper. Cheaper still is Rutter's closing suggestion to dispense with sheeted foam altogether and go for a 1/4 sheet balsa wing. Tell us how you get on if you try this. Below, plenty of room inside for the gear; note sliding mixer elevator/aileron arrangement. Below left, battery and ballast is concealed beneath the vac-formed tailpipe.

This particular model represents something of a record for me in that it took me about four years to build it instead of the usual two or three weeks! Not that there is anything difficult about the model, it just happened that I went off the idea with the model three-quarters finished when I realised that the original idea of powering it with a diesel would ruin the Solarfilm finish very quickly.

Only when a suitable glow motor became available did I bother to dig it out again, hence the lack of actual construction shots - I'd already built it before I thought about publishing it! The model is a typical delta in that it is quite fast in a straight line but loses a lot of speed in manoeuvres other than in the rolling plane, due to the airbrake effect of the wing. The roll is very fast and reasonably axial considering the need for slight 'up' all the time on the elevons. Despite its speed the model is also capable of flying very slowly and the typical landing slide (you could hardly call it a run with no wheels) is very short. Other than some shortening of the nose to lessen the need for tailweight, the model is quite close to scale and, like most of the Mirages, has very appealing lines (to me at least).

Getting cutting

Construction begins with the wing which is foam with balsa skinning in the case of my model though veneer would be cheaper. In answer to those wondering how to cut a delta wing with a hot wire cutter my answer is that I didn't. I carved and sanded it instead. The foam core is a piece of 1in thick styrene from the local DIY store cut to shape with a very sharp kitchen knife. The thickness of the l.e. and t.e. is marked symmetrically about the centre of the foam and lines representing the basic flattened aerofoil section are marked on the top and bottom of the wing. The knife is then used to rough cut the section before finishing it off to a smooth shape with new glasspaper and very light pressure. To keep the foam flat I made the top section first and skinned it with balsa before starting on the bottom section. Needless to say, this demands a certain level of confidence that you are going to get it right - foam is very cheap compared to balsa. Once the skinning is done the hard balsa l.e. and t.e. are added and carved and sanded to blend in with the aerofoil. The control surfaces are 1/4in medium carved and sanded to a more or less wedge-shaped section. I top-hinged the elevons with film on my model but I realise that other builders have their preferred methods. The control arms on my model were my usual flattened and bent brass tube soldered to 14G piano wire torque arms. At this point I covered the wing with the base colour film.



Mirage 2000

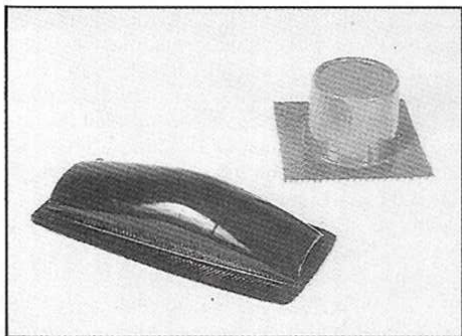
Your Full-Size
SPORTSTER PLAN

Try John Rutter's fast
and furious sports scale
delta for up to 30-size
engines

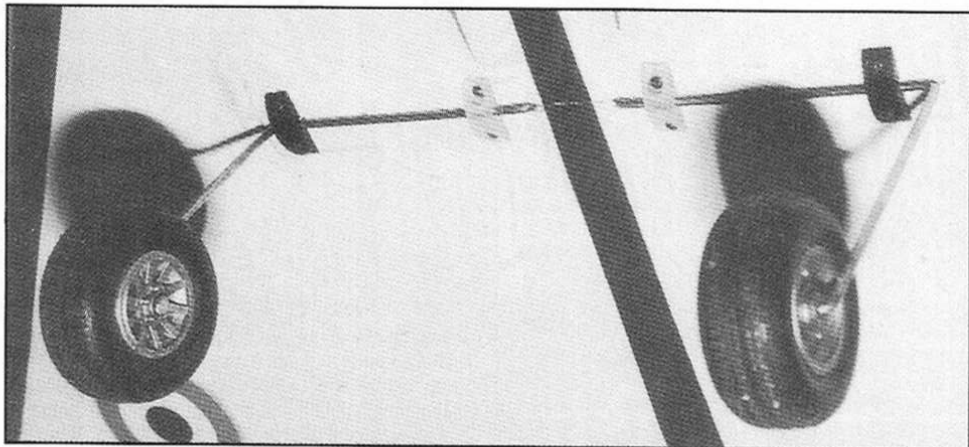
Fuselage

The fuselage represents the final part of the construction and is made from 3/16in balsa, ply reinforced in the nose section. I cut out the sides and formers and assembled it over the plan, though to keep things simple I didn't cut out the wing section on the lower fuselage sides until the assembly was complete. This should help to keep the sides straight and make sure that they match the section that you have created rather than the one that I drew - they are unlikely to be identical! The drawback to this method is that it is easy to lose the thrust line so be very careful when adding the extreme nose section. Dependent on the motor/mount used you may need to make the motor section a bit wider than that shown. My Irvine .20 was a very tight fit. GRP in the tank bay is a very useful way of fuelproofing it whilst adding a great deal of strength. I used a home-made tank to get the maximum amount of fuel in the space available but you should be able to find a commercial alternative.

Once the basic framework is complete it can be glued to the wing being careful to keep it straight and to cut away any film under the join. Once set, the R/C gear can be installed. I used three channels to give ailerons, elevator (through a sliding mixer) and throttle, though if you are brave enough to do without throttle, two channel gear could be used and, if you felt like it, four



To help you make an even better job of your Mirage 2000, ASP Readers' Services can offer a vac-formed black canopy and white tailpipe set to fit at just £6 including postage and packing. Cheques and/or postal orders to ASP at Argus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST and please order as 'RM361 Mirage Set'.



A fixed undercarriage allows take-offs and landings but will probably require an increase in engine size...

channel gear would fit without too much head scratching. Control throws were typical for a delta at 6mm each way for ailerons, 10mm each way for elevators (if you can get it, I made a bit of a mistake on the slider and can only get about 5mm down with the result that the model won't hold inverted) all measured at the root of the elevator surface. I used a snake for throttle. When you are happy with everything the fuselage top decking is added along with any block, though I left the inlet shock cones off until after covering for ease.

Sand everything smooth and add the fin with its 'bulges'. Cut out the hatches and cover the remaining uncovered areas with film. All the trim on the model was done with film and the engine bay, canopy and tailcone were painted. I vacuum formed the canopy and tailcone - no doubt the editor will make copies available.

The battery is held in place against the plywood rear former by binding it to a couple of woodscrews with copper wire. To get the c.g. shown you will also have to add a fair lump of lead, which goes against the grain but will result in a better model. The c.g. shown gives a reasonable compromise between stability and manoeuvrability, in my opinion, but as deltas are not too fussy on c.g. position, this could be adjusted within reasonable limits to suit your taste.

How does it go?

Flying follows the usual checks for control throws, direction and c.g.; note that my model needed about 3mm up on the elevons to give level flight. My launch method is to hold the model above the access hatch and launch it with an underhand throw to the right of the prevailing wind with the right wingtip down at about 30-40°. This is to avoid the worst effects of torque reaction which are quite pronounced with such a short span model that is (hopefully) highly powered. The first launch is likely to be the most

frightening as the ailerons are very sensitive once the speed has built up but relatively insensitive at the launch.

Try to gain the safety of altitude quickly. As previously stated the model is quite fast in a straight line and very fast in the roll though, because of the great speed loss in tight loops, it's better to do large loops. Being a delta, the model will fly very slowly and stably but increasing amounts of up have to be fed in to stop the nose dropping - it will almost hover in a mild breeze with full up elevator. I've found it very difficult to stall the model in the conventional sense but it might be possible to get the model into a flat spin - I've come close to this on a couple of occasions; down elevator and full throttle seem to get the model out of it. Landings are best done by dropping the model in from a height before pulling the nose up to give a slow, nose-high approach. With practice and a delicate touch on the throttle, landings can be at almost no speed at all!

A bit of a postscript

As a bit of a postscript, I experimented with the installation of a set of wheels on the model as I felt that the take-off from a hand launch was a bit unreliable on calm days. (Not many of those about this summer). This made take-off somewhat more realistic but slowed the model down - all that drag. So to cure the loss of speed I put an ST .29 on the front and a bit more lead in the back. The model is now back to its original speed, climbs better and accelerates out of turns faster. The only snag is that you have to be wary of a torque roll if you snap open the throttle on a very slow, nose-high pass. I discovered the latter piece of information the hard way. The model now has a new nose!

One final thought; I wouldn't mind betting that the model would perform every bit as well with an all-sheet wing - this would save a lot of construction time and be cheaper too if 1/4in sheet were to be used...