40" GLOSTER JAVELIN

So, the Javelin is the first of three new models I will be revealing through the RCM&E over the next few months and will be followed, by-monthly by the Jaguar GR.1 and then the GR4 Tornado.

All three of the models are continuing to follow the recent theme of "post war jets", and particularly the classic jet 1960-70s era. The Javelin has always been a favourite of mine and dare I say, a subject that is rarely modelled.

The javelin, along with the Jaguar and Tornado, have been flying as bare wood prototypes for some years now, simply because I don't like covering models…. but also, if I ever wished to make any modifications, it is much easily done on an uncovered model, than ruining a covered finished model…. well, that's my excuse.

So, the first Javelin prototype was built around 4 years ago and started life as a 38" span, twin fan model, powered by two 50mm 4S FMS units. The model featured a conventional elevator In the 'T' tail and ailerons. I flew this model in its uncovered state for a number of years and was more than happy with the way it flew and performed.

The only element I didn't like was the elevator and complexity of embedding the servo into the tailplane. The Javelin did have a known problem of the wing 'blanking' the elevator in certain conditions. I did experience this in the bottoming out of loops, and it did make me a wee bit nervous that you weren't feeling the full elevator authority as I had hoped. On speaking to Steve Rickets who had a large turbine Javelin, the clear message was to forget about the conventional elevator and go with elevons…..well the Javelin is a Vulcan with a tailplane after all.

Having recently designed the 37" Harrier and being very impressed with the 4S PowerFun 70mm fan (available from www.4-max.co.uk), I decided to try this option in the second Javelin prototype. The unit does give a very good level of static thrust and as such, launching should be so much easier. The cost difference will also save you money as the setup is 40% cheaper than the twin fan option.

So, prototype number 2 was duly built with a single 70mm 4S unit and with Elevons. I had to increase the size of the model to 40" span and deepen the fuselage slightly, to get the 70mm EDF to fit. What a revelation it was…. The model although bigger, felt more powerful but more importantly the controls were more precise.

With a prototype that now works well, there was only one thing to do….and that was to get it covered, painted and detailed.

To assist the builder, I have once again made available a VAC set and CNC/wood pack, for those who wish to make the building process a little easier and quicker. These parts will only be available through Tony Nijhuis Designs Ltd (TND) and not via Morton's.

The plan itself will only be available in this edition of the magazine with future copies only being available again through TND Ltd.

The battery used in the prototype was a 4S-4500mah 60c LiPo. The servos were metal geared 12g, 2.2kg/cm torque for the elevon servos. For the ESC, a 60amp 4S ESC was used. Make sure you set the timing to "High", which will suit the EDF unit and get the maximum power from it.

Lastly and possibly the most important, a photographic build log is available as a free download to print out from www.tonynijhuisdesigns.co.uk. These photos will be invaluable and I would suggest downloading these so you can familiarise yourself with the build before you start.

Rear Fuselage

On the assumption you have bought the CNC pack, it's a good idea to number all the parts to avoid any confusion later.

Begin by joining two sheets of 100mm wide 4.5mm balsa and make up the bottom of the fuselage. The cut-out line is shown on the plans.

Mark the positions of the fuselage formers F4 to F9 on the bottom sheeting.

On the plan you will notice four angle templates. Use these to align the correct angle of formers F4 to F9. Glue the formers into position noting that the sheeting will need a longitudinal centre cut in it to allow for the gluing of the cranked bottom edge of F4.

Add the top 6.5mmsq stringer to brace the formers.

Now add the six remaining 4.5mmsq stringers to the fuselage formers and the fin support strips. Also glue into position the fan mounting plates, FM1.

Mark out the bottom air intake as shown on the plan and the build photos and cut away the bracing strip on F7.

Using soft 2.4mm sheet balsa, begin to sheet the fuselage sides. I suggest you wet the outer surface of the sheeting to aid bending.

On the underside, make up two triangular filets from 2.4mm balsa and insert these between F4, the stringer and the under sheeting.

Using a razor plane and sanding block, begin to shape the fuselage to a smooth flowing profile.

Front Fuselage

Make up the front fuselage sides FS1 and the fuselage formers F1 to F3.

Using the SLEC building jig, begin assembling the fuselage, adding F2 and F3 first, checking squareness as you proceed. Then add F1. Note that FS1 is not symmetrical so note the correct orientation and mark the top of FS1 to avoid build errors.

Now align F3 with F4 using the centre hole, and glue the front fuselage section, on to the rear section.

As access will become more difficult, make up the battery support tray, using scrap 3mm Lite Ply and secure these using scraps of 9.5mm triangle, against F4 and F5.

Make up four shaped pieces of 2.4mm sheeting that go to make up the top and bottom sides. Spend a little time getting these right and fettled in. Wet the outside surface of the sheet to assist in bending and glue these into position.

When dry, razor plane and sand the top and bottom edges flush with the formers.

When happy, add the top and bottom sheeting using 9.5mm balsa.

Using a razor plane and sanding block, begin shaping the fuselage to a smooth round radius.

Back to the Rear Fuselage

Install the fan and ESC and check the fan functions and that it rotates in the correct direction.

Now make up the thrust tube using the template shown on the plan. This is made from an A3 sheet of 140-micron thick acetate and is normally available from a Stationary supplier or eBay. The easiest way to make the tube is to roll it round the fan and secure the overlap with a piece of tape. At F9, spread the acetate sheet so it sits snugly against the opening in F9 and then tape the overlap. By squashing the tube, you can pull the tube out the end of the model. Apply a seam of tape along the overlap and the tube is done. Reinsert the tube from the rear through F9. The tube can be secured onto the fan with blobs of hot glue.

Wings

The wings are a traditional 'built up' construction and are made over the plan. The sequence detailed below should be followed closely to avoid construction difficulties.

Begin by taking the 6.5mm sq hard balsa lower forward spar and pinning this over the plan. Note that the spar is notched and tapered slightly between W6 & W7. Now fit all of the wing ribs remembering to use a set square against all the ribs.

The top rear obechi spar can now be glued into position. Note that the rear spar fits between W1 and W4.

Next make up the trailing edge, using 6.5mm sheet balsa and fit this between W4 and W7. Now fit the inner leading edge (made from 3mm sheet balsa) and the top forward spar.

Finally fit the stub spar, between W1 & W3, made from hard 6.5mm sq balsa.

Remove the wings from the building board and add all the under spars, and servo support rails.

Now make up the other wing to the same level and glue into position the wing spar WS1.

The next sequence can be a little bit tricky so please follow this stage closely.

Using a modelling pin, locate the rear edge of former F6 and draw a vertical line. Then mark an offset line, 3mm parallel to the first. Using the marked lines, cut a vertical slot in the fuselage side at the centre of F6. Now slide WS1 into the fuselage and check this sits flush and aligns with the centre bar of F6.

As the 6.5mm.sq spars touch the fuselage, mark and cut the opening for these to pass through also. Don't be too concern if these openings are too large, the important element is WS1 lining up against F6. The other important alignment mark is where the bottom of the inner leading edge buts against the side of the fuselage. There is a note on the plan as to where this should be. Please make sure that both the wing leading edges, match this dimension.

On the plan, you will notice a spacer template which is designed to fit between W1 and the fuselage side. Use this when gluing the wings into position. This will align the wings square onto the fuselage.

Apply a good quality wood glue to WS1 and slide the wing into position. Clamping of the WS1 onto F6 can be achieved through the fan intake hole in the underside.

Apply glue to all other wing parts that butt or recess into the fuselage, checking alignments as you proceed. Now leave to dry.

Using 1.5mm sheet balsa, begin to sheet the top of the wings from the leading edge, back.

Trim the sheeting to reflect the finished wing perimeter.

Before sheeting the underside, remove the jig tabs from the underside of each rib and sand smooth. Make up the servo support mounts and fit the servo wiring. When done, the wing sheeting can be applied in the same sequence as the top sheeting.

Trim the sheeting flush to the finished wing perimeter.

Using 12.5mm sheet balsa, and as shown on the plan, make up the wing tips and glue these into position.

Now make up each individual aileron as shown on the plan. Start by cutting to shape the bottom skin. Now trim and fit the leading edges which are made from 6.5mm sheet balsa. Now fit the riblets and the control horn support block. Trim the top of the leading edge flush with the angle of the riblets. Finally enclose with the top skin and trim to shape, as shown on the plan.

Using 22mm wide strips of 6.5mm from balsa sheet, make up the outer leading edge and glue this onto the inner leading edge. This can now be profiled, using a razor plane and sanding block, to a smooth flowing curve, and as shown on the plan.

Fin & Tailplane

Make up the fin parts as shown on the plan. Glue them together and profile the fin leading edge. Add two lengths of 9.5mm triangle to the sides of the top edge. This gives additional support to the tailplane.

Now make up the tailplane parts. Round off the tailplane leading edge and glue this to the top of the fin. Finally add the top fin faring and with a round sanding block, blend the triangle smoothly into the fin and tailplane.

Put the fin aside and only glue into position once the model is nearing completion.

Finishing off

Mark and cut out the fin slot in the top of the fuselage. Insert the fin to make sure it fits snugly.

With the EDF installed, a portion of the removed air intake, can be glued back into position, behind F7.

The battery access hatch can be cut out to the dimensions shown on the plan. There are a few ways to secure the hatch but as an alternative to that shown on the plan, small neodymium magnets and covering film hinges, work just as well.

Two dummy under pods were made from laminates of 12.5mm balsa. This allows for a good grip when hand launching.

The VAC formed nose cone can be trimmed and F11 inserted and glued into position. Trim any plastic overhang flush with F11 and glue the nose cone centrally on to F1. Now blend the fuselage smoothly into the nose cone.

The VAC formed air intakes need to be trimmed and F10 fitted to strengthen the opening edge. These can now be glued into position against F4 and then blended smoothly into the rear fuselage, using a sanding block.

Covering

The prototype was covered using a neutral Oralite (4-Max also do a very good covering film). Allow the covering to cover the VAC formed joint by 3mm, to allow a smooth contrast between the film and plastic vac form surface.

The covering was then flattened with an abrasive pad, and camouflage paint applied with a quality brush.

A decal set, fan intake air vents and pilots are available from www.tonynijhuisdesign.co.uk.

Fit all the control surfaces with flat flock hinges and secure with glue. Fit all the servos and all the control horns. For the control horns, I made these out of 2mm birch ply and slotted these into the control surfaces.

The C of G position should be achieved with just the positioning of a 4S 4500mah LiPo. The battery is secured using self-adhesive Velcro™ and a securing strap.

The canopy can either be fitted before or after covering. I prefer to detail the cockpit, fit the canopy and then cover the model around the canopy, but it's up to you.

Flying

The first thing to note with the Javelin is the wing loading is quite low; only 13oz/sq' so hand launching it is very easy.

So, using my trusted javelin launch technique, the model will get away cleanly but be prepared to add a little elevator when you do get back onto the sticks…. once up to speed, you can almost let it climb away without any control input…it is that steady in the air! Even on calmer days, the Javelin will always get away cleanly.

However, I suggest for its maiden flight you get a trusted helper to launch the model for you. The model is remarkably strong and if it doesn't get away first time, she'll survive.

When you get the Javelin airborne you will notice how nippy the model is. Once the initial climb out has been executed, you can easily pull back the throttle to around half stick position and enjoy what is a very scale flying performance.

You'll find the model simply grooves and flies on rails especially on a calm day. However, if you fly on a windy day, the model will rock and waggle a little, especially in cross winds, so be prepared to fly with more throttle.

All the classic jet manoeuvres can be done with this model, but you will need full throttle and speed on some, as the model doesn't have the momentum to carry through manoeuvre such as big loops etc. Just remember to keep the routine smooth and keep what little momentum it has, going.

Landings are very straightforward and generally you will run out of elevator control before the model will stall.

Don't be tempted to adjust the C of G. The model has been thoroughly tested and where it is shown on the plan is exactly where it needs to be!

The 4S 11 bladed PowerFun EDF unit does give an amazing punch and flight times are surprisingly good. So, expect a good 5 minutes depending on throttle use.

I have to say the Javelin hasn't disappointed and really looks stunning in the air. What a lovely flying model this has turned out to be and has far outweighed my expectations. Dare I say it, it is one of the best models in my collection. It's small enough to sit in the back of the car, ready to go, but it looks, feels and flies like a turbine model, So, all in all this EDF Javelin is a cracking little model and flies incredibly well. I think this really will be a popular choice amongst builders out there as it is such an iconic aircraft; Enjoy!

Specification:

Gloster Javelin

Wing span	40” (1015mm)
Length	43” (1096mm)
Wing loading	13.oz/sq’(4kg/m2)
Target Weight	51oz (1.45kg)

Addition Plans, Vac set, combined CNC / Wood pack, pilots and decal sets, are available from: www.tonynijhuisdesigns.co.uk

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