

## **29" JAGUAR GR.1**

This is the second model in a series of three offerings and yet again paying homage to the classic British jet fighters of the 1960's.

Although the Jaguar didn't enter service until 1973, its manufacture and design was embedded in the 1960s.

The Jaguar has always been a favourite of mine and although I would have loved to have squeezed in a nice single 70mm fan, the size option didn't really work. So the model started its life and remained as a twin 50mm fan model. I guess in homage to the full sized aircraft.

As with all the other prototypes in this new series of models, I have been flying the Jaguar in its bare wood state, for quite a few years now. I really don't like covering, so it's the main reason why prototypes stay as prototypes. However, what tends to drive the prototype forward is a sudden burst of nice flying weather and maybe finding and rekindling the love for a particular model.

The Jaguar, like the Javelin, was designed some 4 years ago and was originally designed for two 50mm EDF fans. It was only this year that I decided to dust off the Jaguar and give it another round of testing. It always surprises me (although it shouldn't really) that all models do behave differently, whether in launch, flight or landing.

For the Jaguar, the positioning of the fans and thrust tubes, coupled with the high wing configuration does give the effect of zero sink on hand launch and she just climes away like a home sick angel.

No other jet I have designed is such a joy to hand launch. It's almost impossible to do a poor hand launch with this model.

The wing is effectively a delta with anhedral and as such, the model will not stall and drop a wing...testing this model for many years has shown up some real quirks that needed a little sorting. The C of G is quite critical so please do adhere to the position shown on the plan. Having tried a rearward C of G, I can confirm that the model will happily drop into a flat spin, but one that was the most sedate and dare I say, the strangest to watch.

It simply fluttered towards the ground like a sycamore leaf, then with power applied she hovered to the gentlest of arrival with no damage. I was both shocked and amazed.

So, this year the love of the Jaguar was rekindled when some final testing on a lovely calm evening, revealed just how nice the model was. Needless to say, an AUW of 2lbs 9oz and a calm day makes the Jaguar an absolute joy to fly.

To assist the builder, I have once again made available a VAC set that includes the nose cone, air intakes and the canopy. For those who wish to make the building process a little easier and quicker, a CNC/wood pack is also available to purchase. 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 6-8g, 1kg/cm torque for the ailerons and elevator and for the ESC, two 40 Amp 4S ESC's were used. Make sure you set the timing to "High", which will give the EDFs the most power.

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

## **Fuselage**

On the assumption you have bought the CNC pack, number all the parts to avoid any confusion later.

Begin by making up the fuselage side pieces, FS1, 2 & 3, as outlined on the plan. Glue together parts FS1 & FS2 to make a complete fuselage side.

Mark the positions of fuselage formers F1 through to F8 on to the fuselage sides.

Now line the top rear inside edge of the fuselage sides with 9.5mm triangular balsa. Then continue to line the bottom inside edge and the top forward edge with more 9.5mm triangular balsa. Note that the lower edge between F6 & F7 is lined with 12.5mm triangular balsa. Also note that adding saw cuts at regular intervals will assist in bending of the fuselage sides when adding the formers.

Using a SLEC building jig, insert and glue into position formers F1 through to F5.

Now add F6, F7 & F8.

Add the top rear sheeting, using 3.2mm balsa between F6 and F8. The fuselage can now be removed from the building jig.

At this point it's probably a good idea to install the two FMS fans and make up the thrust tubes. When done, the bottom sheeting from F1 to F7 can be fitted, using 4.5mm balsa. The bottom rear under sheeting can then be applied using 3.2mm balsa.

Before moving onto the next stage, profile the fuselage to the former profiles shown on the plan.

Now make up the air intakes starting by adding F9 and then adding FS3. Chamfer the mating edge of FS3 where it meets with FS1. Now add F10 and build up the fairing using 6.5mm triangular balsa and templated piece, FS4. Note. Only use small amounts of glue on F10 as these formers are sacrificial and will have to be removed later.

Line the top and bottom of the intakes with 3.2mm balsa. Begin to profile the intakes to shape, using a razor plane and then sandpaper.

The sacrificial formers F10 can be removed and discarded. Using a small round sanding tool, begin to sand the inside corners of the intakes to a smooth curve to match the out radius.

Now make up the nose block made from a sandwich of 9.5mm balsa sheet. Trim and shape this using a razor plane and sanding block to profile smoothly into the fuselage. If not already done so, profile the rest of the fuselage to a smooth flowing finished shape.

As shown on the plan cut out the battery access hatch in the under sheeting and then trim away further (towards the fan) to reveal an air intake hole. The hatch is hinged at the front with covering film and will stay closed under suction pressure from the fans.

Finally install the battery tray made from scrap 3mm lite ply. It's worth installing the speed controllers and checking for correct rotation of the fans, while access is good.

## **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 x 3.2mm obechi lower forward spar and pinning this over the plan. Note that the spar at W8 will need to be notched to accept the shallower slots in the rib.

Also pin the 6.5mm.sq stub spar on the plan and glue the chamfered end onto the main spar.

Now fit all of the wing ribs remembering to use a set square against all the formers and the anhedral template against W1.

Fit the corresponding top spar.

Using 4.5mm sheet balsa, make up the Aileron section of the trailing edge and the inner trailing edge between W1 and W2.

Fit the inner leading edge (made from 3mm sheet balsa).

The top wing surface can now be skinned with 1.5mm sheet balsa.

Remove the wing and trim wing sheeting edges. Make up the aileron tray support framework.

Make up the other wing panel to the same standard. Remove the wing rib jig tabs.

## **Joining the wing**

Now join the two wing panels together adding the wing spar WS1.

Install the aileron servo wiring and any additional framework needed to support the servo trays.

Now sheet the bottom of the wing and trim the edges flush. Make up the outer leading edge from 6.5mm balsa sheeting. Make up the ailerons and the wing tips and sand the wing smooth.

Mark out the locations of the elevator servos and cut the opening in the fuselage sides. Use the ply doublers to reinforce the servo openings as shown on the plans. At this point it may be worth threading the servo extension wires through F6 & F7.

The wing can now be glued on to the fuselage and blended into the fuselage 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 FN3 & FN4 and make up two small strips of 3.2mm balsa to sit across the fin. Put the fin aside and only glue into position once the model is nearing completion.

Now make up the tailplane parts. Round off the tailplane leading edge. Join the tail halves using the ply brace TS1 to set the correct angle.

## **Finishing off**

The fin slot in the top of the fuselage can be cut and the Fin inserted.

The razor back pieces RB1 and RB2 can be added.

The position of these two pieces determines the location of the canopy, so trim the canopy to a good fit against the fuselage.

Because the razor back flairs on to the canopy, the RB4 pieces should be glued on RB3 at the front. I would suggest shaping the radius curve of RB3 before they are fitted just for ease. Finally glue the two FB3 pieces into position and blend this into the rear of the canopy.

The canopy can now be fitted.

I prefer to detail the cockpit and then fit the canopy and cover the model around the canopy.

The finlets shown on the underside of the fuselage can be either fitted before or after covering.

Please Note that there are additional vents to go into the sides of the fuselage, just in front of the fans.

## **Covering**

The prototype was covered using light grey Oracover™ from J Perkins (4-Max also supply some great film). The vac formed intakes were painted. Allow the Oracover to cover the canopy end by 3mm, to allow a smooth contrast between the film and the canopy and then paint in the corresponding matching Oracolor™ paint the canopy lines and edges.

A decal set, intake air vents and a pilot are available from [www.tonymijhuisdesign.co.uk](http://www.tonymijhuisdesign.co.uk).

Fit all the control surfaces with flat cyano hinges and secure with glue.

Fit all the servos and all the control horns.

The C of G position should be achieved with adjusting the position of a 4S-4500mah LiPo.

Do not be tempted to move the C of G back from the stated position, it is tolerant of adjustment, but I have spent many hours finding the sweet spot.

The battery is secured using self-adhesive Velcro™ and a securing strap.

## **Flying**

As I mentioned in the opening few paragraphs, hand launching the model is incredibly easy. Just throw it and she will happily climb away with no elevator input.

However, I would suggest for its maiden flight you get a trusted helper to launch the model for you.

Once the hand launch is mastered and the Jaguar is trimmed for flight, the model will get away with little fuss every time and with very little control input. Even on calmer days, the Jaguar will always get away cleanly.

Once the Jaguar is 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 be thrown around a little and will balloon a little so be prepared to fly with more power. I would only recommend flying the model on calmer days as it really does make the flying performance much more enjoyable.

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 manoeuvres such as big loops etc. Just remember to keep the routine smooth and keep what little momentum it has going.

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

The two 50mm 4S FMS units do give an amazing punch and flight times are surprisingly good. So, expect a good 5 minutes plus depending on throttle use.

I have to say the Jaguar does have a few quirks, but what a lovely flying model this has turned out to be. Dare I say it, it is one of the prettiest 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 twin EDF Jaguar is a cracking little model and flies incredibly well. I do hope it is going to be a popular model as it is such an iconic aircraft.

You really will enjoy flying this one!

## **Specification Jaguar GR.1**

|               |                     |
|---------------|---------------------|
| Wing span     | 29" (735mm)         |
| Length        | 43" (1091mm)        |
| Wing loading  | 22.oz/sq'(6.5kg/m2) |
| Target Weight | 41oz (1.16kg)       |

Additional plans, vac set, combined CNC / wood pack, pilots and decal sets, are all available from

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