

## **32" DH VAMPIRE**

Well it's been almost two years since the last of my offerings in the mini jet series; the last being the 21" TSR2, and I have to say that all six of them have really been incredibly successful. Not surprisingly, the Jet Provost was the most popular, followed closely by the Gnat. Now I'm not putting bets on whether these next four are going to pip them to the post, but I have a feeling the Vampire will give the Provost a pretty good run for its money.....everyone loves a De Havilland Vampire don't they!.

So looking forward, after the Vampire will come the F9F Panther, the F9F Cougar and ending with the F-16 Falcon. These next three will be scheduled for July, September and November 2023 issues of RCM&E.

I think one of the key drivers for the success of these little models, has been down to the small handy size and the frugal cost to build one. With a cheap EDF, economy servos, lipos and speed controllers, it really was maximum fun for minimal money.

In recent years, the 'inlet bell-mouth' as a standard feature on fan units, has been offered by most, if not all EDF manufacturers. This effectively does away with the need for a smooth moulded air intake within the model. As a consequence it allows for a simpler installation of the fan unit into the fuselage and only requires a simple discharge tail pipe, fitted to the rear of the fan unit.

Now I will admit that the smooth intake ducts are still generally found on 'ready to fly' designs as they do provide a more efficient installation. However, more recently, manufacturers have been dispensing with these, in favour of cheat vents, local to the fan intake. This is something I have been doing for quite some time now as trying to make smooth intakes out of balsa wood, would be too challenging, and over complicate the design. So it's nice to see the ARTF manufacturers, are now following suit.

The simple analogy is; as long as you make enough holes just in front of the fan to allow it to breathe, you will have a ducted fan model that will work very well indeed

All of these new mini jets have been tested using the 3S FMS fans or the 4S Power fun unit which gives around 650g of thrust for the 3S and 850g for the 4S.

The Vampire was tested on a 3S FMS fan unit. If the builder wishes to install a 4S version, there really isn't a down side to installing this, except the ubiquitous 3S 2200mah, which most modellers will have kicking around their workshop in their droves, will have to be substituted for a 4S 1800mah battery ..... These models are quite small so the key here is to avoid adding too much weight when moving up to a 4S setup...

To assist the builder, I have once again made a vac formed canopy available. To complete the package, a CNC/wood pack is also available, 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). The plan itself will only be available in this edition of the magazine with future copies again only being available through TND Ltd.

For this model and the next three designs, a full set of decals and pilots will be available through Tony Nijhuis Designs Ltd (TND).

A few other points to note, the FMS fan units can be sourced either from 4-MAX.co.uk in the UK. The batteries used were a 3s-2200mah 30-50C LiPo and the servos were 6g to 8g, (1kg/cm torque) nano servo.

For the ESC, I suggest you buy a 40amp 2S to 4S unit. One thing you will need to do is set the ESC timing to 'high'. This will suit the EDF motor and will give better performance.

Lastly and possibly the most important thing to say, is 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.

## **Wings**

The wing parts are made from 6.5mm ( $\frac{1}{4}$ " ) medium density balsa sheet and each wing panel is made of 5 parts. Weigh the individual parts and interchange them in order to achieve an equal balanced wing. Now glue the wing parts together to form a left and right hand panel. The aileron parts 4 and one of the rear pieces 3, should only be tack glued as these will need to be removed later.

Where indicated on the plan, highlight using a pen, the location of the area of balsa to be profiled. An indicative guide to shaping the wing is shown on the plan. With the wing panels flat on the building board, use a razor plane to profile the wing panels to the first stage of completion as shown on the plan. Now either continue with a plane or with a sanding block, begin the second stage of profiling. Now turn the wing over and repeat the process exactly, so the wing is fully symmetrical. Use one of the fuselage sides to make sure the profile is correct at the wing root. When happy, use a medium grade abrasive paper to finish both wing panels, to a smooth flowing profile.

Now cut out the ailerons 4, remembering to mark, which one fits to which wing. You may have gathered that as the wings are shaped fully symmetrical, it doesn't matter which one is the left or right.

The wings can now be joined together and the 3mm birch ply wing spar fitted. To add a little extra strength, cut a 40mm wide strip of 50g/m glass cloth and wrap centrally around the join. Secure the cloth with PVA glue.

To finish, use fine abrasive paper to round off the leading edge and the wing tips and the wings are done!

## Fuselage

Begin cutting out the fuselage side pieces 7 and all formers 8/8A, 9, 10 and 11. Note the motor wiring holes in former 8A. The idea of a split fan former, is to allow easy access to the fan, should it need replacing.

Mark the location of the formers onto the left and right hand side of each fuselage side. Add strips of 12.5mm triangle along the bottom edge of the fuselage sides, as shown on the plans.

Make up the fan mount 8/8A and check the fan fits ok. Now fit the formers 8, 9 (the bottom part only) and former 10, to one side of the fuselage.

Now fit the other fuselage side and add the remaining former 11.

Now roll the top of each fuselage side, and glue against former 10. Add the cowl cheeks 12 and the lower triangular fillets.

Add the bottom sheeting from soft 5mm balsa sheet.

Now make up the thrust tube. I have shown on the plan a cut outline of the thrust tube, before it is rolled. The tube is made from 140micron thick acetate. You will be able to source an A4 sheet of this on either EBAY or from a stationary's....it is basically the thin clear plastic material, used on the front of report covers etc. The easiest way to make the tube is to roll the end of the acetate around the fan unit as tight as you can. Make it a straight tube and then secure with a small piece of scotch tape at the fan casing.

At this point, it is advisable to fit the fan unit into former 8/8a. As suggested on the plan, I used a couple of dabs of silicon or hot glue to secure this; you don't need anything more than that. A point to note here is the new FMS fans have been made from a different type of plastic and hot glue does not adhere well to it. I would suggest you key the glue areas on the fan casing with sandpaper.

Now slide the rolled tube in from the rear of former 11. You will have to fold the tube in on itself but as it slides through, it should pop round again. Gently ease the tube over the fan unit by 12mm or so, making sure the motor wires are exiting smoothly through the slot you have made in the tube. If you have positioned the wiring slot correctly, the tube seam should run along the bottom of the fuselage.

Finally run a piece of tape along the joint length, making sure the tube is pressed hard against the inside edge of former 11. Use a couple of dabs of hot glue; one on the top and one on the bottom to secure the thrust tube to the fan casing....again it doesn't need any more glue than that!

I would suggest at this point you loosely fit the ESC and check the fan motor rotation is okay.

Now add the top part of former 9 and begin to roll the tops of the fuselage sides, up the sides of formers 8, 9 and 11 and glue.

Now sand the top edge of the fuselage sides, flush with the tops of the formers.

Add the fuselage top sheeting in three sections. At the rear of the fuselage, between former 11 and the tail pipe, two modified triangular pieces need to be made to fillet the top corners, as shown on the plan.

Now finish off the cowl by adding the top sheeting and the triangular fillet piece. Finally add the nose block (made from 12.5mm balsa sandwich) to the front of the cowl.

Now for the 'shaping' exercise, so make sure your razor plane has a new blade in it....

Please remember that there is a lot of shaping around the nose and the triangle balsa is there to be cut into, to create the smooth flowing curves of the Vampire, so don't scrimp on the shaping. Use the razor plane to start profiling and then progress on to using a sanding block.

The bottom battery access hatch can now be marked and cut out. On the plan is shown how to make a magnetic retaining catch.

#### Booms, Fin & Tailplane

Make up the 4-piece boom parts. Note there are two inboard and two outboard pieces which take account of the wing dihedral.

Begin by lining the inside with 6.5mm sq balsa and fitting piece 14 into position, as shown on the plan. Enclose the boom with the corresponding side and profile to the outline shown on the plan.

Cut an opening in the boom side to allow the elevator servo to fit into.

To make up the fin, use parts 16 to 17 and glue them together. Profile the fin leading edge. Note that one of the fins has a cut out for the elevator servo.

Glue the fins into each boom.

Now make up the tailplane and elevator using parts 18 & 19. Round off the tailplane leading edge and chamfer the elevator leading edge, ready for the hinges to be fitted.

#### Putting together

Before the wings can be fitted, the ailerons 4 and the tack glued rear piece 3, need to be removed. Now slide the wings into position and securely glue to the fuselage. Replace the rear piece 3 and glue this back into position.

The aileron servos are recessed into the underside of the wing. A 'teardrop' cover plate is made up from scrap 1.5mm ply or plastic card. This is glued over the top of the opening. The servo is then double sided taped into position. You will notice a 5mm wide slot is cut into the wings to allow the servo leads to be recessed. Now insert a 5mm sq length of balsa into this slot, seating it flush with the top surface of the wing. The

remaining recess of 1.5mm is for the servo lead to pass along, into the wing fillet

Once this is done, the booms can be positioned, making sure the elevator servo lead exits the underside of the wing and has sufficient length to enter the fuselage and reach the receiver.

Dry fit the tailplane and make any adjustments to the booms before gluing them to the wing. The tailplane can also be glued to the fins.

Two fairing formers, made from 3.2mm balsa sheet stock, can now be slid over the wing and glued to the fuselage sides. There is a template on the plan to assist making this.

At this stage, a pair of vent opening should be cut through the fuselage side in the location shown on the plan.

The air intake fairing can now be made by spanning 1.6mm balsa sheeting between the fuselage and the inside edge of the booms.

The final and most important of all is the large cheat air intake hole, in the underside just in front of the fan. There is also a cheat hole in the top of the fuselage to be cut in. It is important that all the cheat holes shown are cut in the exact positions as shown on the plan. Failure to do this will cause poor thrust from the fan.

On the underside air intake hole, make sure you chamfer and smooth the entry leading edge of the opening. Also, don't be tempted to reduce the size of the opening. It needs to be the size shown.

## **Covering**

The prototype was covered using silver Oracover from J Perkins.

An alternative more cost effective covering is available from [www.4-Max.co.uk](http://www.4-Max.co.uk)

As I mentioned earlier, there is a full set of decals available for this model and these are only available from [www.tonymijhuisdesigns.co.uk](http://www.tonymijhuisdesigns.co.uk)

Fit all the control surfaces with flat hinges and secure with glue. Fit all the control horns and pushrods etc.

A small amount of nose weight may be required to achieve the C of G with the installation of a 3S 2200mah LiPo battery.

The battery should be secured using self-adhesive Velcro.

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

## Flying

The first thing to note is the wing loading is quite low for this model; only 18oz/sq', so hand launching them is quite easy. You will need full power and a firm throw. Make sure it is straight and slightly up. I suggest for its maiden flight you get a trusted helper to launch the model for you. The model is remarkably strong and if you don't get it away first time, she'll survive.

Once the hand launch is mastered and trimmed for flight, the model will get away with little fuss and very little control input. On calmer days, expect to put in a touch of elevator just after hand launching.

When you get the model airborne and assuming you have cut in the fan breather holes, you will notice how nippy the model is. Once the initial climb out has been executed and the model is fully trimmed, you can easily pull back the throttle to two thirds 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 do fly on a windy day, the model will be thrown around a bit so be prepared to fly with more throttle, but I would suggest you save this little beauty for calmer days and winds up to 10mph.

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. It's worth keeping a little power on for the landing approach but cut just before touchdown.

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 little 3S-11 bladed FMS fan unit, does give an amazing punch, but if you want more power, there is a 4S version, which should satisfy those speed freaks amongst you.

Flight times are surprisingly good, so expect a good 5 minute duration, depending on throttle use.

The Vampire is a cracking little model and flies very well indeed. A cheap model that could be made from what you have in the scrap box, a £40 fan unit, a £24 battery and a couple of servos, and you instantly have big fun for small bucks.

Enjoy!

**Specification:**

Wing span     32" (810mm)  
Length         26" (659mm)  
Wing loading  18.oz/sq'(5.4kg/m2)  
Target Weight 24oz (0.675kg)

Addition Plans, VAC set, combined CNC / Wood packs, pilots and Decal sets are only available from:

Website:        [www.tonymijhuisdesigns.co.uk](http://www.tonymijhuisdesigns.co.uk)  
email:            [sales@tonymijhuisdesigns.co.uk](mailto:sales@tonymijhuisdesigns.co.uk)  
Phone:           07563 518 159    9am to 4pm