
FULL SIZE FREE PLAN *by Peter Rake & Simon Uglow*



Low passes for the camera are simple with this stable, predictable little model.

Fokker D.VIII

A 1/8 scale electric powered model designed by Peter Rake with the prototype model built and described by Simon Uglow

The Reinhold Platz designed 'Flying Razor', as it was nicknamed by allied pilots, arrived too late to have much impact on the outcome of the air battles of World War One. Originally designated E.V (that's E.5), a series of fatal wing failures saw the parasol monoplane fighter temporarily withdrawn from service. After the problem was rectified - main spars having been found not to be to design speci-

fication - the *Idflieg* (German Air Command) ordered resumed production. Redesignated the D.VIII the 'Flying Razor' went on to claim the last aerial victory of the Great War. A total of 289 E.Vs were manufactured from an initial order of 400 machines.

The model

Peter's model is to 1/8th scale, giving a wingspan of 42". At this size, the fully assembled model fits nicely into the back

of your average family car. With excellent flying characteristics, this may just be the perfect electric scale park flyer.

Designed to use either three or four function controls, depending on which wing you build, I obtained a set of laser cut parts and construction was commenced on the three function version.

(Since this model was designed some time ago, I have updated the plan to show the option of a brushless, 'bell' style out-



runner motor in addition to the original brushed set-up. It simply requires a rectangular 1/8" ply firewall and spacers. This more closely resembles the arrangement Simon used. PR)

Tail surfaces

The tail feathers are quickly built over the plan from strip, the rudder receiving a laminated outline, of three strips of 1/16" x 1/8" balsa, formed around a foam board template. Laminating in this way produces a very strong but also light structure. Eminently suited to curves, the rudder as here, or wing and tail plane tips are easy to produce, so don't be afraid at giving this technique a go. Foam board is ideal for producing the template. Take care to not cut to the full rudder size, but 3/16" under to allow for the balsa thickness.

Protect the edges of the template with Sellotape and pin securely to your building board with cling film beneath. Pre-cut your balsa strips and allow to soak thoroughly. You may use ammonia (purchased as Cloudy Ammonia from the cleaning section of your local supermarket) added to the water if you wish, but beware the smell and the irritant effect to eyes and nose. This is especially noticeable if you use hot water for the soaking.

Once nicely pliable, run each strip through a saucer of PVA glue to coat thoroughly. Now take your three strips, stack them and then, starting at one end, work your way around the template pinning as you go. The laminates will slide over one another at this stage allowing for their different curve radii. I like to use a small strip of shim brass as a fence outside the laminates to help apply even pressure and prevent the pin indentations otherwise caused.

This detaches easily once all is dry. Several days are best here. Ply control horns are let into the control surfaces after covering, to allow hooking up to the closed loop controls. *(The plan shows pushrod operation, but closed loop is a simple upgrade. PR)*

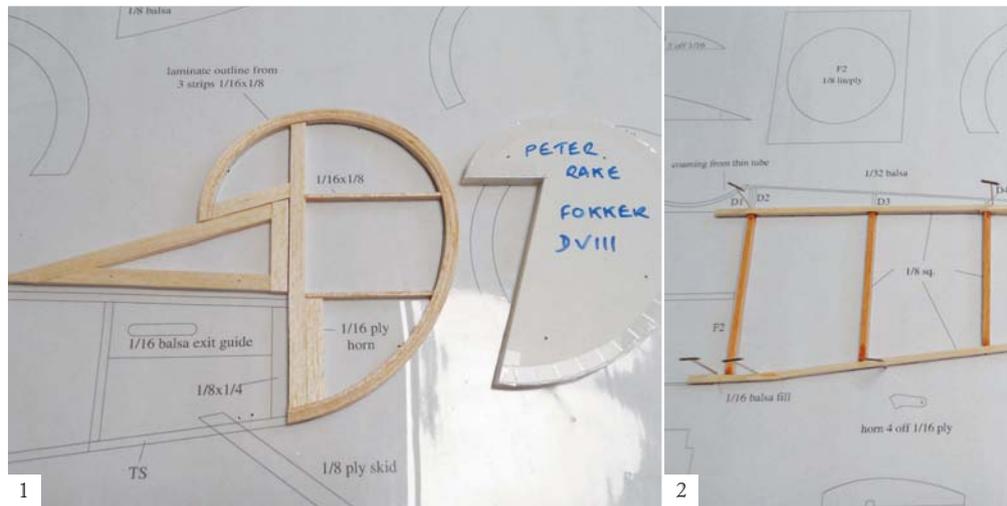
Fuselage

The fuselage follows Peter's preferred and well proven construction method: a forward fuselage box, mated to a stick built rear fuselage.

The rear fuselage is the standard build; two sides over the plan joined with these sides pinned directly over the plan. Cut the uprights for both sides when building the first and you are almost guaranteed two identical sides. Similarly so the cross pieces. Cut two of each, fitting the lower (pinned and therefore fixed) stations using the second between the top longerons for absolute squareness.

With the forward fuselage largely self-jigging using the precision of the laser cut parts, a few strategically placed supports allow this to be glued in one sitting. This is again accomplished over the plan view, on the building board, to ensure accuracy. Once joined to the rear fuselage, a series of sub formers are added to accept the rolled balsa top decking and develop the fuselage shape.

Prior to adding the top sheeting, the centre section struts need forming. All the strut lengths are accurately shown and using 1/16" piano wire the bending work isn't too arduous. The two upper struts are sewn and epoxied to 1/8" ply mounting plates. The lower strut is made a free fit into a



piece of brass tube, securely boxed in on F1b. With the fuselage attachment points fixed, the wing attachment point can be soldered in situ.

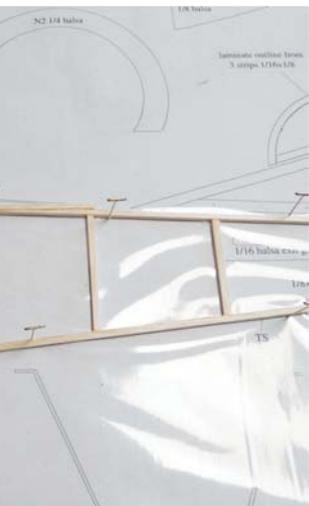
Whilst you're in the swing of things, you may as well shape the rear wing strut and undercarriage. These items are each sewn to further ply plates in the fuselage bottom, but only after covering. Using measurements taken from the plan, a simple jig was constructed at one end of the building board and the undercarriage legs soft soldered together. This same jig was used to hold the undercarriage legs for mounting the undercarriage wing and piano wire axle.

Returning to the fuselage: take the opportunity to paint the false cockpit floor (not shown on the plan) and detail the cockpit to taste whilst you still have ready access. The top decking is now added in two pieces: from the firewall to the rear of the cockpit (foremost D1 to rearmost D1) and from here to the front of the tailplane seat (D2 to the 1/8" square at the front of the tailplane).

When dry, the cockpit aperture can be marked and cut. Simplified gun troughs were also cut to later accept a pair of 1/8th scale Spandau guns, purchased from Wright Brothers Aviation. These are delightful additions to this model. A combi-



Pretty as a picture, the model shows off the intricately applied finish and vinyl graphics.



3



4

nation of laser cut balsa, thin card for the perforated cooling jackets and plastic rod, they assemble quickly and paint up well into light, but convincing facsimiles.

A separate cowl, formed from laser cut laminations of 1/8" balsa and ply with 1/32" ply wrapping, is next. Use balsa stand-offs to set the distance between C1 and C2 before adding the ply wrap. To aid this last step I soaked my ply overnight in a water/ammonia mix and then taped and rubber banded the ply to an appropriate sized coffee tin to pre-form the curve. This was left to dry for about ten days, (Easter intervened) and made the job of attaching the ply so much easier!

The cowl fixing was addressed at this time using the now commonplace neodymium magnets. These are recessed into the rear of C2 and the front of F1B. Glue all magnets at the same time with a piece of waxed paper between. This ensures both correct polarity and accurate alignment. This completes the basic fuselage

Wing

The last major assembly to tackle is the wing. Here you are offered a choice, for three and four function models are shown. Both are built as a single piece, albeit as three distinct panels. The single spar, itself

constructed from three pieces, sets the dihedral and wing taper. As such, the wing spars are different for the aileron equipped and non-aileron wings. The laser cut parts include the necessary pieces for either spar. The wing centre section is constructed first, followed sequentially by the outer panels, packing the unsupported structure as required.

No washout is included, so each section is built flat over the plan making for a quick and easy assembly. All the ribs are delightfully cut with the option of cutting lightning holes. These double as servo wire runs for the aileron-equipped wing. You will be required to construct the ailerons, modify-

- 1: Probably the hardest part of building the tail surfaces involves laminating the rudder outline.
- 2: The totally 'traditional' rear fuselage begins with building side frames over the plan.
- 3: Once joined with cross braces the sides make a strong, but lightweight box structure.
- 4: The forward box structure that ties together all the heavy items the model will require.

CUT PARTS SET AVAILABLE

For readers wishing to build Peter Rake's Fokker D.VIII, we have a laser-cut component pack available. We emphasise that these cut-part sets provide ready-cut pieces of all the bits that you would otherwise have to trace out onto the balsa or plywood sheets before knifing them out, thus saving a fair bit of tedious time, so that the airframe assembly process can start immediately. The parts sets do NOT include strip and sheet wood that you can get from your friendly model shop. **The parts set costs £75.00 plus £9.50 for carriage in UK. Sets can be supplied to overseas customers, with carriage costs quoted on an individual destination basis.**

Order direct from Key Publishing Ltd, PO Box 100, Stamford, Lincolnshire, PE9 1XQ, U.K. (Tel: 0178 480404)





The simple modification Simon made to fit a brushless motor.

ing the appropriate wing ribs, as a common set of ribs is used for either wing. My version is the three-function model.

Installation & assembly

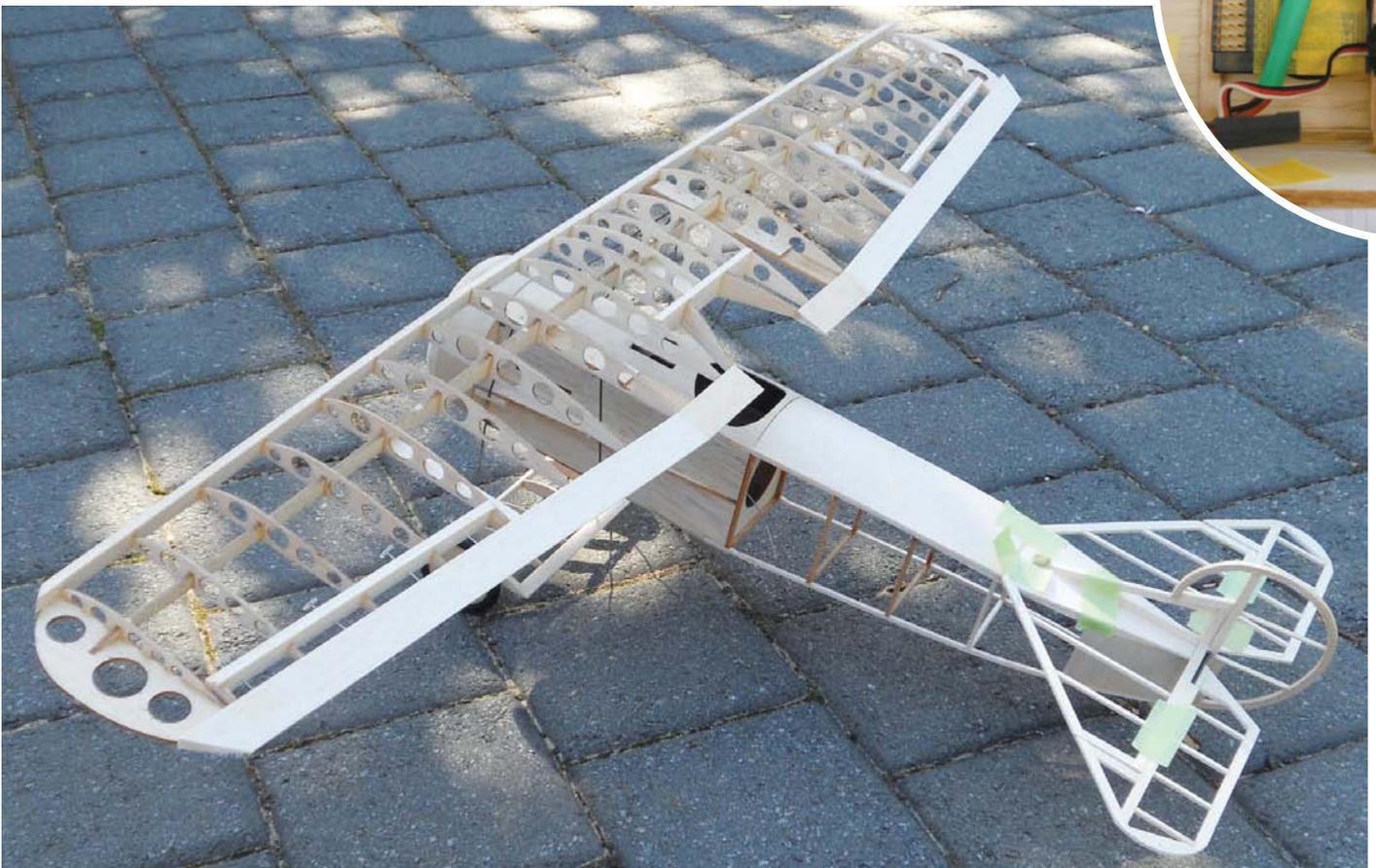
With all the basic structure completed, now is a good time to start the radio installation and mount the motor. My chosen power plant was an AXI 2212/34 running an 11x5.5 inch APC-E prop from a 2s 2150mAh LiPo. A Jeti 18 amp speed control and two Topaz 9gm servos completed the electronics. The plan itself doesn't show any details for mounting, but shows the location of a similar power motor.

As stated, I chose to add a false floor onto which I glued my pilot. The floor underside doubled as a mount for the receiver and speed control and acted to support the bottom of the servos. The servos themselves are mounted to conventional spruce rails. Silicon sealant was used to attach all these items. Two hatches in the fuselage underside achieve access to the radio. The forward hatch is used for battery changes. Despite the undercarriage appearing to be in the way, battery changes are fuss-free with the model supported inverted.

Drilling of the wing mounting blocks is now required. To accomplish this, support the wing inverted on a flat surface. I used some foam wedges that accommodated the wing profile and dihedral. Now lower the fuselage onto the wing, again supporting as necessary. Check and double-check the key alignments before marking where the strut attachment points locate. Allow any slight discrepancy here when comparing one side to the other as long as the wing-to-fuselage and wing-to-alignments are accurate.

Once satisfied that all is well, remove

RIGHT: Despite the compact size of the model, there is ample space in the avionics bay.



Although seen here with the aileron wing option (Simon built both wings) the little DVIII shows off the uncomplicated structure.



Although seen drifting sedately overhead, the model is capable of far more spirited flight performance - even on just three channels.



the fuselage and drill the mounting blocks slightly outboard of the strut positions.

Use your choice of screw to cut a thread, remove and reinforce the hole with thin cyano. Thin brass straps were fabricated to clamp the struts to the mounting blocks at final assembly.

Covering & finishing

I had always intended to depict one of the naval 'bumblebee' schemes on this model. After being suitably chastised on RC Groups: with accusations of wimping out and tongue-in-cheek comments of "lozenge was the only scheme used on the full size", I succumbed to pressure and chose a scheme with just enough lozenge to satisfy. As a bonus though, the scheme sported a very attractive yellow cowl, yellow wheel covers and a striped horizontal tail. The deciding factor for this scheme was undoubtedly the snake motif. This ran almost the full length of the fuselage sides. With a picture of the finished model now forming in my mind, I just had to find a way of reproducing the scheme.

Easy parts first: The cowl is simply sprayed using chrome silver as a base coat. This enables some rubbing back of the yellow topcoat to simulate wear. Canopy glue 'rivets', applied with the hypodermic-like nozzle from a bottle of Superphatic and syringe prior to painting add to the effect. The scored card wheel covers are also painted. One wheel inspection panel was left open with false piano wire spokes glued behind to add a little interest. The wing is covered with dark green *Litespan* and brush painted with thinned olive green oil paint. Both the horizontal and vertical tails are covered with white *Litespan*. The tail striping is achieved by masking off the white

stripes, with *Tamiya's* excellent kabuki masking tape, then spraying semi-gloss black enamel.

Now for the tricky bits: The fuselage received a base covering of cream litespan for all but the dark green (*Litespan*) forward panel. Each fuselage side requires three panels to accommodate the centre section (c/s) struts. *Aerodrome RC* kindly provide a series of downloadable lozenge patterns in various scales. The appropriate 1/8th scale pattern was glued to a piece of thin ply and the individual lozenges cut out as templates. Each lozenge on the model is actually a piece of doped tissue, cut using these templates; definitely a case of it taking longer to do than to describe - twenty five hours plus, for the fuselage and undercarriage wing.

A few customised lozenges were required to account for slight errors in cutting and positioning, but overall the fit was excellent. Graphics were custom cut by *Callie Graphics*.

Scale detailing proceeded, with the fitting of the Spandau guns and a dummy motor, scratch built from items to hand: 5ml syringes, suture material (guess the day job!) tape, piano wire and the bottom of a small bottle. An acetate windscreen with piano wire frame and a real leather cockpit combing applied over a spilt length of vinyl tube were added. The tubing here creates depth to the combing and simulates the padding of the full size machine.

The undercarriage legs and struts were faired with a strip of 1/16" balsa, tissue covered and painted. Weathering followed with a combination of oil paint washes and powdered pigments.

Flying

Balanced as per the plan, 1/8" in front of the spar, the morning of the maiden dawned calm and generally bright. Taking off is a thing of beauty! The model lifts its tail early, then holds that configuration until you actively ease back on the elevator. In flight the model is stable and perfectly controllable with the three functions. Some control authority was lost with reduced throttle, but this was with

low rates. Power was adequate for gentle flying and for the close-in slow passes required for the photos, which show the model off to its best advantage.

On landing, use throttle to control the descent rate. Touch down with a little power on, hold up elevator and roll out to a full stop.

The power draw with the listed setup is very modest. There is room to experiment (up to an 11"x8" propeller on 3s) if you desire a more spirited flight envelope.

Indeed later flights with a 1500mAh 3s, pack, but sticking with the original propeller have proven this point with no apparent loss in duration. Loops, stall turns and barrel rolls are now easily accomplished. (Unfortunately, Simon's flying proved a little too spirited for the relatively soft balsa spar supplied with the laser cut parts - it failed mid-flight. Since I thought you probably wouldn't want to include this 'scale' feature on your model, I have upgraded the parts to bass. PR)

If you only build one model this year, make sure it's this Fokker DVIII, she's a honey!

