

ACHTUNG BABY... THE WW1 FOKKER EINDECKER SSSDR REPLICA

Already having built a WW2 replica Mustang, *Dave Stephens* takes a look back to an earlier conflict and builds a German WW1 fighter

> WHILE finishing the T51 Mustang (see February issue), I was getting itchy feet about my next project. Having so enjoyed the performance of my RV6, which I did not build myself, I had no trouble falling in love

with the RV8, and that was always going to be my next project.

But after the blood, sweat and tears of building a complicated plane like the Mustang as a first build, I wanted something simpler for my second project. The SSSDR category had

never really appealed to me, as those I had seen did not look like 'real' aeroplanes. That was until I saw the Fokker E111 Eindecker. I had built a model Eindecker as a kid and I just had to build one of these new kit versions.

I contacted GSAL (Grass Strip Aviation Ltd)



Clockwise from main: The Eindecker looks far more substantial than its 115kg would suggest; Dave brings the Fokker in for a three-point landing; well wrapped up against the winter chill.

and tried to order one. It was hard work because the individuals involved in GSAL are so conscientious that the thought of someone building an untried aircraft from one of their kits was almost too much for them to cope with! They initially wanted me to wait until their aircraft had flown, but I pleaded with them and they finally agreed to sell me a kit with the proviso that I kept them informed the whole way through so they would be able to offer advice.

I chose to drive to Aston Down to pick up my kit, and looked closely at their 80% complete prototype. The original American kits come as just a load of tubes and some A4 plans, whereas the GSAL kit comes with all the bending done (apart from the sheet metalwork at the front) and lovely full-size plans that make it a dream to build.

Their version has also had a number of weight-saving modifications incorporated to ensure it comes in below the max permissible 115kg, and I was going to continue with this

ethos: I wanted to fit one or two non-standard 'extras' and the thought of it coming out even a gram overweight and potentially being reduced to the status of a gate guardian was not an option!

The build is similar to a model; anyone who has built a Super Sixty will have no trouble. I laid out the plans, screwed wooden blocks down to hold it all in place and drilled and riveted it all together. You really need very few tools to build this plane – and some of them are provided in the kit (clecos, cleco pliers, rivet gun etc).

As I got into the build, I kept thinking about

'The build is similar to a model; anyone who has built a Super Sixty will have no trouble'

engineering lightness into the plane. I really wanted to fit brakes and a proper radio/panel etc, so I knew I had to save weight. The first things to go were the solid steel axles, which were replaced with chromolly tube (saving about a kilo).

Next, were the flying wire tangs. The supplied tangs are 4mm mild steel and there are 32 of them, which adds up to a whopping 4.4kg. I had already decided to use eyebolts on the A frame instead of tangs and bolts, as the eyebolts eliminate the weight of the tangs and are not much heavier than the supplied bolts. That lost 50% of the tangs and saved 2kg. I then had some tangs laser cut from 2.5mm stainless steel in a figure-of-eight shape, which came out at half the weight of the originals – another kg saved. Altogether, I had saved enough to add brakes and a radio.

As the airframe neared completion, I had to think about saving even more weight because I wanted to use the optional wheel covers and use turnbuckles for the wing bracing



> PROJECT NEWS

wires and the flying wires. I opted to use the lightweight Oratex fabric from TLAFF (The Light Aircraft Factory) at Little Snoring, as the calculations pointed to a saving of around 5kg over conventional fabric and paint.

The covering is costly and also very different to Ceconite. It is, in fact, very similar to model coverings and takes some getting used to, but the weight savings are priceless.

Once it was covered and basic assembly completed, I did a dry run to see how much it weighed. The first thing I realised was that it was very nose heavy. I contacted GSAL and they said theirs was also showing signs of being nose heavy (but not as much as mine), so I came to the conclusion that as 90% of the covering is aft of the CG, and my covering is lighter, that was the probable cause. After looking at pictures of the genuine E111, it is evident that it did, indeed, have a very short nose, so I decided to shorten it by 8ins (a quick call to LAA Engineering... oops forgot this is SSDR!). An added bonus, of course, was that this saved yet more weight.

I had decided to use the four-stroke 40hp Solo V Twin rather than one of the recommended two-strokes. The engine is the same weight and is only 5hp down on power, but would look and sound much nicer turning the big wood prop I had made by Culver Props in the US.

The airframe had gone together really quickly, but as I had used a non-standard engine I had to think about designing and making the engine mount and cowling. This took a few attempts, but I am happy with the result. I wanted an engine turned alloy cowl, so I decided not to use the supplied 6064 sheet

'The Eindecker has turned out to be a super plane that will take off and land on a sixpence'

and opted to buy a sheet of 2024-T3 from LAS Aerospace. It is non-structural, so I bought it in a size five thou thinner than that supplied in the kit.

Once the airframe was finished, it was time to decorate it; the Oratex comes pre-coloured, but you can paint graphics onto it. I had already applied for a registration (G-FOKR) and also for military exemption from wearing it, although the disadvantage of the latter was that once I had given the CAA details of the scheme I had to stick with it. I contacted Nigel from Flightline Graphics (who did all the masks for the Mustang) and he designed and produced all the masks required to make painting it a pleasure.

With the aircraft finished, it was time for the moment of truth. I had carefully weighed the project in bits throughout the entire build, and already had it in my mind that I could use wheels that were lighter than those supplied (they are really heavy) and also make lighter wheel covers, if necessary. That would save a further 3kg-4kg. I used three identical digital scales to weigh the plane, and checked them with a 56lb weight. It came in at 114.7kg – mission accomplished!

It was strange building this aircraft without an Inspector looking over my

shoulder, but I did get Dennis Goss (my Inspector on the Mustang) to give it a good once over at the field.

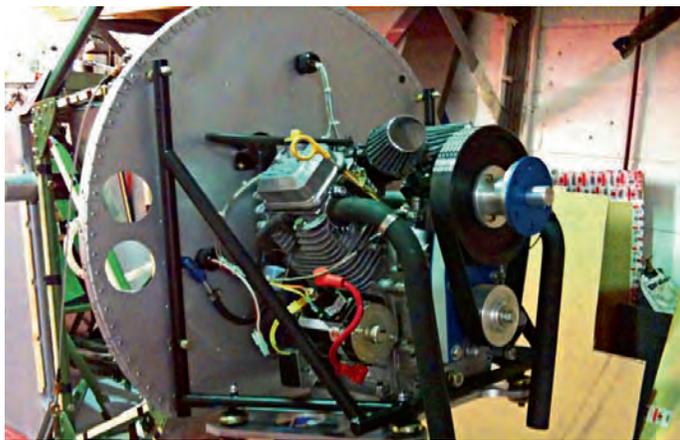
While I did the first flight on a freezing cold day (you can see it on http://www.youtube.com/watch?v=JBUXT_3gz1), it all went well apart from high CHT. Rudder and elevator are very sensitive, ailerons are tame (as you would expect), and I am working with GSAL to develop a bungee system to help give the elevator some 'feel'.

Since test flying it, I have had to add some thin ducting around the cylinders to cool the engine, and I might have to add a bit of reinforcement behind the seat where you climb in, so I'm sailing close to max allowed weight. My next mission, therefore, is to take the wheels to my local bike shop and get them to fit lightweight rims and spokes to the existing hubs. Like the axles and tangs, the wheels are supplied as standard to all Airdrome aircraft, including the big radial-powered full-size Triplane, so they really are a little over engineered for this very lightweight aeroplane.

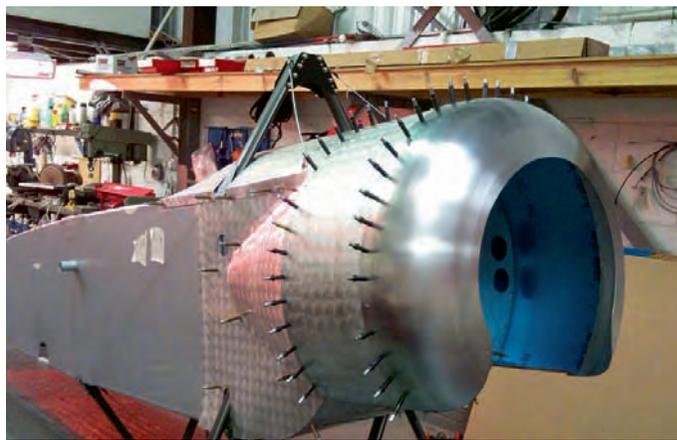
I had a trailer built for it to live in, because the Eindecker rigs/de-rigs in about 35-40 minutes and the trailer will save £2,500 a year on hangar costs.

All in all, the Eindecker has turned out to be a super little plane that will cruise at 45-55mph and take off and land on a sixpence. I am looking forward to the warm summer months when it will be great fun to fly. It was also quick and rewarding to build.

I am really hooked on this aircraft-building lark, and build number three is already planned – my RV8 kit arrives in April.



The four-stroke Solo V-twin engine weighs the same as the two-stroke options and puts out an ample 40hp. Sounds good, too!



The engine-turned forward fuselage aluminium cladding and the beautiful nose ring give the aircraft an authentic WW1 appearance.



The inverted fuselage with assembled chromolly tube landing gear complete with large-diameter spoked vintage-style wheels.



The fuselage components are laid out on full-sized plans and riveted together with pulled rivets using basic hand tools.