

F4C W/C Project

THE PANTHER IS LOST

The first four flights went according to the plan, half a tank of fuel to keep the wing loading down and keeping the flights short to avoid running out of fuel. After flight four we decided to reduce the aileron travel by 20% due to the roll rate being very high. With the flight trim pretty sorted out, the 3.4 litre tank was filled for flight five. With the Panther lined up on the runway the throttle was opened and away it went. I will digress here to explain the technique I use for take off with a tricycle undercarriage aircraft. A small amount of up elevator is used at the start of the take off roll. As the model speed increases this serves to unload the weight on the nose wheel and makes it easier to keep the take off roll on line. Then as the model's speed increases the elevator input is adjusted as required.

However what I failed to take into account was the already nose high attitude of the Panther when at rest and this resulted in a premature lift off. The right wing dropped and the Panther commenced a gentle turn to the right with the roll to the right gradually increasing. Full opposite aileron all though applied (it is evident in the pictures), was unable to stop the slow rolling action. I expected the Panther to accelerate away and the aileron input would start to bite but this did not happen in time and the right wing tip caught the long grass. A boot full of left rudder may have got it straightened out but then it may have crashed from a greater height and these are the split second decisions one makes.

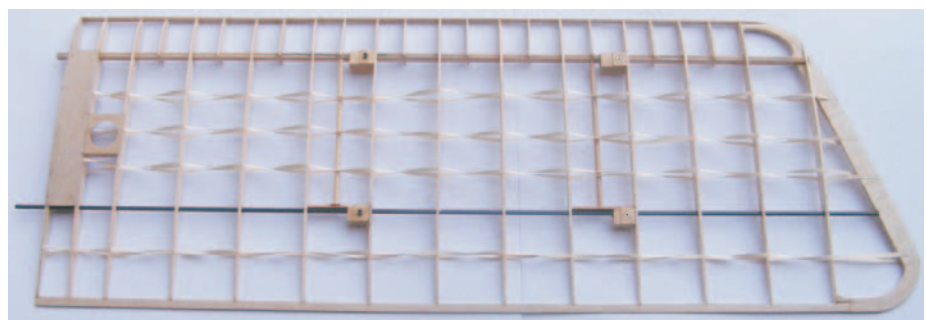
The mistake was to make two changes at the same time early in the test flight schedule, a reduction in aileron travel, an increase in take off weight and a failure to allow for the sit of the Panther when stationary.

THE CONTINGENCY PLAN

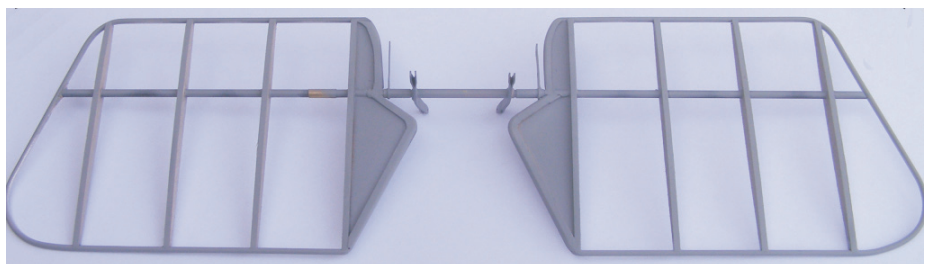
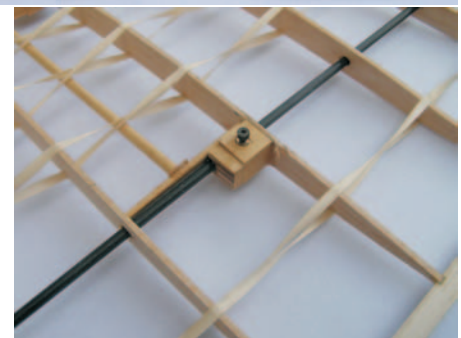
While I did not have an alternative model ready, I did have planned, a course of action if disaster struck. I had two choices available in a simple and quick to build replacement. One choice was a Space Walker and the other a Fokker EIII. I plumped for the Fokker simply because it had rather more character. And of course that all important documentation was readily available from our scale editor, Frank Curzon. This aircraft is at the opposite end of the spectrum from a carrier borne jet, but has plenty of fiddly bits and with



Last flight in Australia.
Monday July 3rd, the 90th anniversary of the WWI battle of the Somme.



The main spar is composed of two lengths of 10 x 6 mm pine with an 0.6mm strip of carbon fibre sandwiched between. This provides good bending strength but is flexible in rotation. The rear spar is a length of 6mm carbon fibre tube. The cables attach to 6mm threaded 3mm brass spacers epoxied into the pine blocks that are notched for the spars. When covered with Oratex the wing would move up and down 60mm at the outer trailing edge.



The all flying tailplane is composed of a carbon fibre tube spar, balsa ribs and 5mm aluminium tubing edge. Except for the balsa ribs, this replicates the full size steel structure. Right is a closer view of the control system. Control cables attach to the forked ends of the horns while the bearing legs extending forward engage slots in the fuselage. Both tailplane and fin can be removed for transport. Most important when you need to travel by air.



lateral control carried out by wing warping it certainly is different.

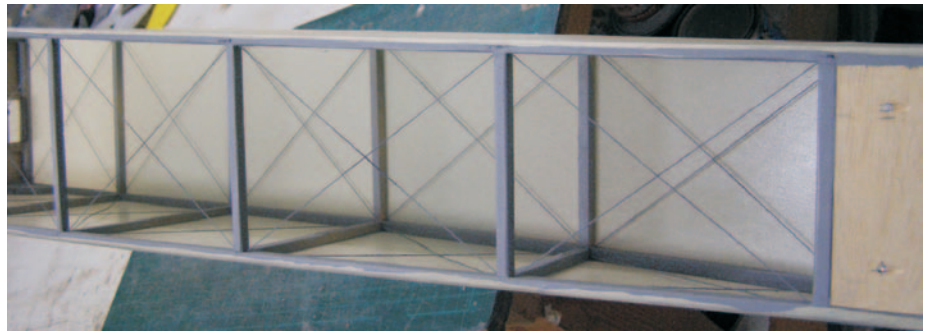
Two weeks of work had the basic structure completed and then it was on to the fancy and rather complicated metal work. The upper pylon that carries the wing warping cables was the easy bit and then the undercarriage structure which incorporates the lower wing warping control took a lot longer.

Much time was spent looking at old and rather indistinct photographs to work out how the various parts fitted together. The only detail photographs are of the world's only original Fokker EIII which is without covering, hanging from a roof and covered in a rather thick layer of dust. There is so much dust on the airframe that even the cable turn buckles are virtually hidden. There however several replicas flying and others under construction and as a scale model is also a replica one wonders how a replica of a replica would be received?

Frank suggested modifying a saucepan for the cowl as he had managed to get one of the right shape and size from his local supermarket. In spite of many visits to many supermarkets the correct size could not be found so the size smaller was purchased. Not quite the right size but some panel beating got it into shape. After emailing the supermarket chain as to the availability of the right size, the reply was that they no longer imported that size.

As there are no full size and covered Fokker EIII,s in existence, supplying colour and marking detail becomes a problem. The written description is of linen covering which is just doped and states that this appeared as a buff colour. Oratex covering was used for the model and when doped and painted with a coat of clear polyurethane to fuel proof it, was a close match to a colour illustration in the Squadron Signal Publication No 158. This may not be historically accurate but does qualify under the rules. Because of the lack of details one has to make judgements as to how things were done. For example it is impossible to tell from the surviving photographs whether rib stitching was used to hold the wing covering fabric to the ribs or whether rib tapes were also applied. It appears from some pictures that the fuselage and wings were covered with sleeves of fabric.

I was concerned about the effect of adverse yaw from the highly cambered wing and the inability to introduce differential to compensate for it. (Adverse yaw is caused by greater drag from the down going aileron when compared to the up going one and this reduces the effective-



The fuselage structure is 6mm pine longerons and braces. For the simulated cable bracing 1mm holes were drilled through the structure at the attach points and cord pulled through and then a dab of cyano applied. The Proxxon angle neck drill came to the fore here and made the hole drilling dead easy.

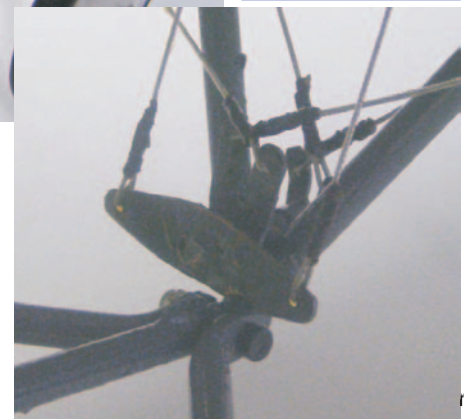


The upper pylon that supports the wing warping cable pulley and the landing wires that attach to the front spar. The aluminium skin is lithoplate that is burnished with a small wire brush in the Proxxon drill.



The undercarriage structure is 6mm chrome steel tube. The ends were flattened and ground for the attachments. Below is the control bellcrank for the wing warping system

ness of the roll input. In extreme cases it can cause the aircraft to turn in the opposite direction to the roll input.) I rigged the wings with washout at the tips to minimise any adverse yaw effect and in fact there is little evidence of any during flights to date. With a flexible wing structure supported by cables it is easy to adjust the cables to generate whatever rigging posi-



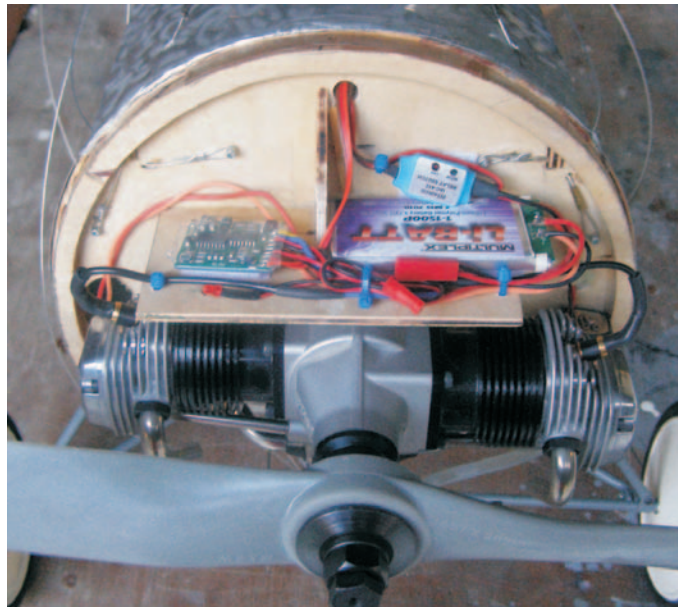
tion you want. Brought back memories of my time in the aircraft industry!

The Oberursel nine cylinder rotary engine that powered the Fokker turned at some 1200 RPM. So nine divided by two (it was a four stroke) and multiplied by 1200 gives us an exhaust note 5,400 pulses per minute. To get as close to this sound as possible an OS 160 Gemini four stroke twin was chosen to power the EIII. The rotary engines used in WWI typically did not have a throttle and power was reduced by switching of the ignition to cylinders. Full, three quarter, half and quarter power were available to the pilot and for an "idle" the complete ignition was momentarily turned off which is characterised by the blipping sound of the engine when one views film of these early aeroplanes.

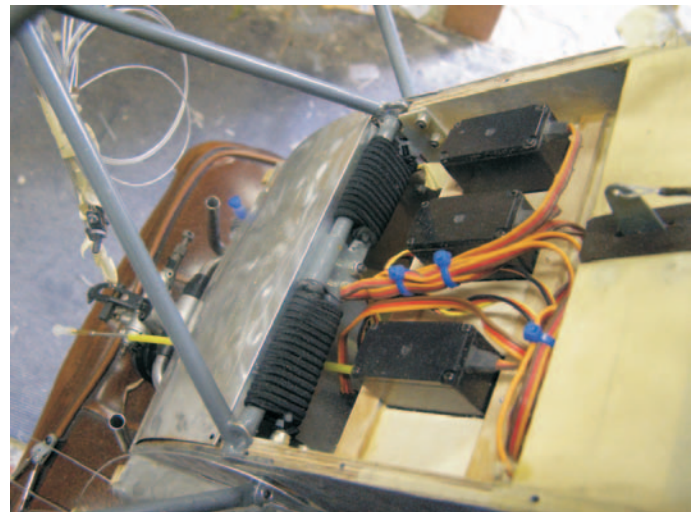
To simulate this effect with a glow engine, I fitted a solenoid valve in the fuel line that is controlled by the button on top of the stick in the MC24. Push the button, the solenoid closes and shuts off the fuel. On board glow keeps the engine running when fuel is turned on again. When tested with a running engine the effect was exactly the opposite, turning off the fuel caused the engine to lean out and the RPM increased not decreased as required. So much for that idea!

Like many high end transmitters the MC24 has two throttle curves available and one can switch between these, so a reduced throttle curve was assigned to the stick button and presto, pressing the button blipped the engine. Mind you I did use fast and powerful digital servos on all controls including the throttle.

Four weeks into the project the structurally complete EIII flew and so far we



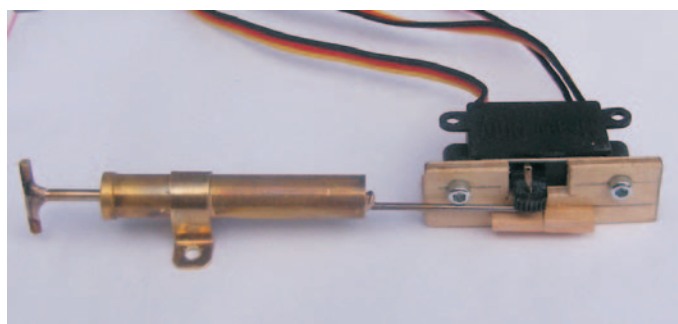
The OS 160 Gemini installed. On top of the plate is the 1500mAh Lipo glow plug battery and the SJ glow controller. The glow plugs are connected in series so each plug gets 1.8 volts. Works like a dream and the idle is superb. The little box above the battery is the solenoid controller and has since been removed.



The servo installation and the undercarriage springing system. The black cotton covered elastic provides the shock absorbing and works really well. One can just see the elevator bellcrank with the cable attached.



The pilot's seat frame is from 1/8 brass tubing silver soldered up. To be clad in litho plate and then leather.



The original EIII used this hand operated pump to transfer fuel from the rear to the front fuel tank. Makes for a perfect method of operating the radio switch.

are on track with six flights to date. And I must say that compared to a heavily loaded jet it is a doddle to fly.

When setting out a flight schedule for the competition one comes up with a very confusing and in my opinion a completely illogical rule. This is the classification into aerobatic and non aerobatic aeroplanes. If you deem the model to be aerobatic there are some manoeuvres that the model cannot use without a scoring penalty as these are restricted to non aerobatic aircraft. The problem is that many aircraft are only capa-

ble of limited aerobatic performance and you as a contestant may have to justify performing those which you may perform that may be considered outside of the aircraft's normal flight envelope. In the case of the Fokker EIII for example any negative "G" manoeuvres are completely out, yet a 60° wing over which it is capable of and did is listed for non aerobatic aircraft. Furthermore, a Lazy Eight which is essentially two wing overs joined by angled straight flight is OK for the EIII. What makes this rule illogical is that under the realism in

flight rules, “choice of options” carries a K factor of 12, (that is the score awarded by the judges is multiplied by 12). And one line in that rule says it all, “The optional manoeuvres chosen should demonstrate the best possible flight profile of original prototype as if it was performing at a full size air display.” One could also choose an Immelman turn, however the turn that the EIII is capable of and described in early flying literature bears no resemblance to the description in the F4C rules.

With the test flights out of the way, detailing commenced and this took longer than the original structure build. Amazing really as it is a pretty simple aeroplane. A gun, some tank caps, a basic cockpit with just an altimeter, ignition switch and pulseometer, plus the joystick. I had to ask Frank, “what the heck is a Pulseometer?” “It is a glass tube that carries the oil pressure and when the oil supply to the engine is OK the level in the glass pulses up and down,” was Frank’s reply and he even had a picture of one.

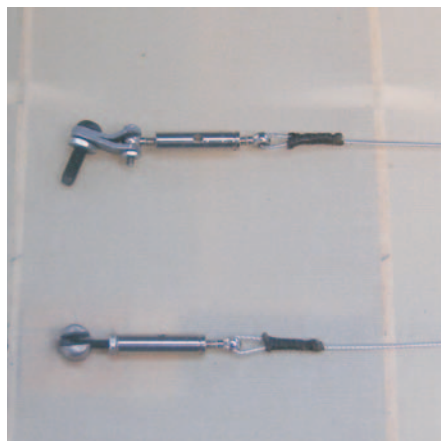
One has to declare on the entry form, those components one did not make and to date these are the Williams Bros vintage scale wheels, the Graupner turn buckles and the Willams Bros. dummy engine. Williams products are available from Proctor Enterprises and their service from the US is pretty good. www.proctor-enterprises.com.

Mind you I discarded most of the engine kit and only used the cylinders and when these were extended cut away to fit around the engine there was a lot of plastic laying on the floor.

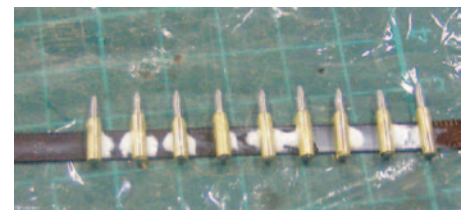
With the Eindecker nearly fully detailed the VFSAA scale competition at the VMAA State field was a ideal opportunity to give the machine its first outing. At these events there is no static judging just flying the scale schedule. The runway surface is pretty rough and I must say I was concerned about tipping the Fokker on its nose during takeoff. However the two flights went OK and some valuable input was gained for the more experienced flyers in attendance.

Gary Sunderland who concentrates his scale efforts on WWI aircraft pointed out that the model would be pinged by the static judges for the method of attachment of the wing cables. I had been unable to find any documentation on this, but Gary explained the method used and then mailed me a drawing. New fittings were made and of course that meant a complete new set of cables were required. Another two days of work but I must say it does look a whole lot better than my interpretation of the attachment. Naturally any change brings unexpected results and this was that the

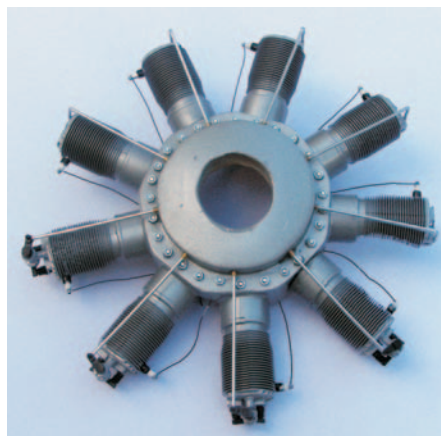
The bullets for the machine gun used a short length of brass tubing for the case and a profiled nail for the bullet. The nail was held in the Proxxon drill chuck to make the profile. A range of collet sizes really make the tool invaluable for tiny work such as this.



The old and the new wing cable fittings. The upper is my interpretation while the lower is far more scale. Thanks Gary!



The assembled bullets were laid on a strip of ribbon and glued with canopy adhesive. Another strip of ribbon was then glued over and between them to finish off the belt.



The dummy engine under construction. I ordered a scale engine kit and when assembled and fitted to the Fokker it just did not look right. Dummy had ordered a 1/6 scale kit but the model is 4.7 scale. The cylinders were extended and a larger crankcase made.

bottom warp cables when becoming slack on the up going wing panel would allow the attachment end to fall out of the fitting.

Air drag may have kept them in but to be safe small pieces of clear tape were applied around the fitting for the last flights before leaving.

As I write this there is just three days to go before leaving and with Frank Curzon’s critical input there is still more that could be done to improve the Fokker. I guess scale competition is really a work in progress. Listen to the judges and make any corrections before the next competition.

And I never got round to making that Pulseometer!

Finally one has to admire the bravery of those men who flew these basic machines during WWII. They were paid to participate in the thrill of flying but at a possible cost of their lives.

The model box is made, the Fokker stored away, and will I, Dot and Stephen be glad to get on that plane!