

Fokker DR.1

World War One Aircraft Models

I have always held a fascination with early military aircraft. After serving for 27 years in the Royal Air Force, I became a Military Aerospace Technical Author. Although, as most modelers, I got involved in the world of construction kits at an early age, I stopped for most of my service career and for some years afterwards.

I started modeling again a few years ago and now enjoy the challenge of building aircraft of World War One. Since posting photographs of my completed models online, several people have asked if I would create a 'build log' for future builds.

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, which covers my build of the Roden 1:32 scale model of the Fokker DR.1 Triplane.

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Completed: July 2017

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INTRODUCTION

Before I start with the build log, I'd like to show how I've set up my work area. I prefer to keep the work area as clear as I can (I've lost too many small items in the past). I think it's important to have the tools etc you need ready to hand and other, non-essential stuff tucked out of the way until needed. I'm lucky in that I have my 'man cave', which is sorted into a modelling area, airbrush spray booth in addition to my work station PC, games PC and games console.

Sorted



AFTER MARKET

Pilot Figure

Black Dog Models F32002 Fighter Pilot 1914-1918 (No.2).

Figure head from Aviattic (Attres029 WW1 1/32 German Pilot Head Set (x5).

Weapons

'Master Model' Spandau LMG 08/15 (AM-32-023).

Decals

LF Models - German Propeller producers labels (Part 2 C3202)

Airscale Dial Decals (Generic World War 1) (AS32 WW1)

Photo-Etch (PE)

JadarHobby Shop - Part No.32028 Fokker DR.1 (1/32)

JadarHobby Shop - Part No.48087 (1/48)

Airscale Instrument Bezels (PE32 BEZ).

Rigging accessories

GasPatch Elite Accessories Turnbuckles

Albion Alloy Micro-tube (Brass or Nickel Silver),

'Steelon' Mono-Filament 0.12 mm diameter.

Sundries

Taurus Models - Fokker Cowl Nuts (D3224)

Paints (Tamiya Acrylic, Humbrol Acrylic, Mr Metal), Microscale's 'MicroSet',

Alclad II Lacquers, PVA Adhesive, Tamiya Weathering MASTER sets (E and A),

Cyanoacrylate (CA) glue (thin), 'Plastruct' styrene rod.

Weathering mediums

Flory Clay washes, AK Interactive engine washes, AK Interactive 'Worn Effects' fluid.

Display Base

Model Scene Grass Mats, sharp sand, purpose built Acrylic base and cover,

etched plaque (name plate).

PREFACE

The pilot :

Wilhelm Papenmeyer was born in Hamein in December 1895. At the age of 22 he was posted into Jasta 2 (Boelcke) on the 11th of November, 1917, having previously been at Jastaschule 1. On the 18 of November he scored his first victory, a Spad VII of No.23 Squadron, RFC. This was followed on the 4th of January 1918 by his second, an SE5a of No.60 Squadron, RFC. His third victory came on the 24th of February when he shot down an RE.8 of No.4 Squadron, RFC. His final victory came on the 28th of March, 1918, when he shot down another RE.8, but this time from No.5 Squadron, RFC. Sadly he failed to return from his sortie. He was 22 years old.



The aircraft:

Reference: 'Jasta Boelcke - The History of Jasta 2, 1916 - 1918' by Norman Franks.

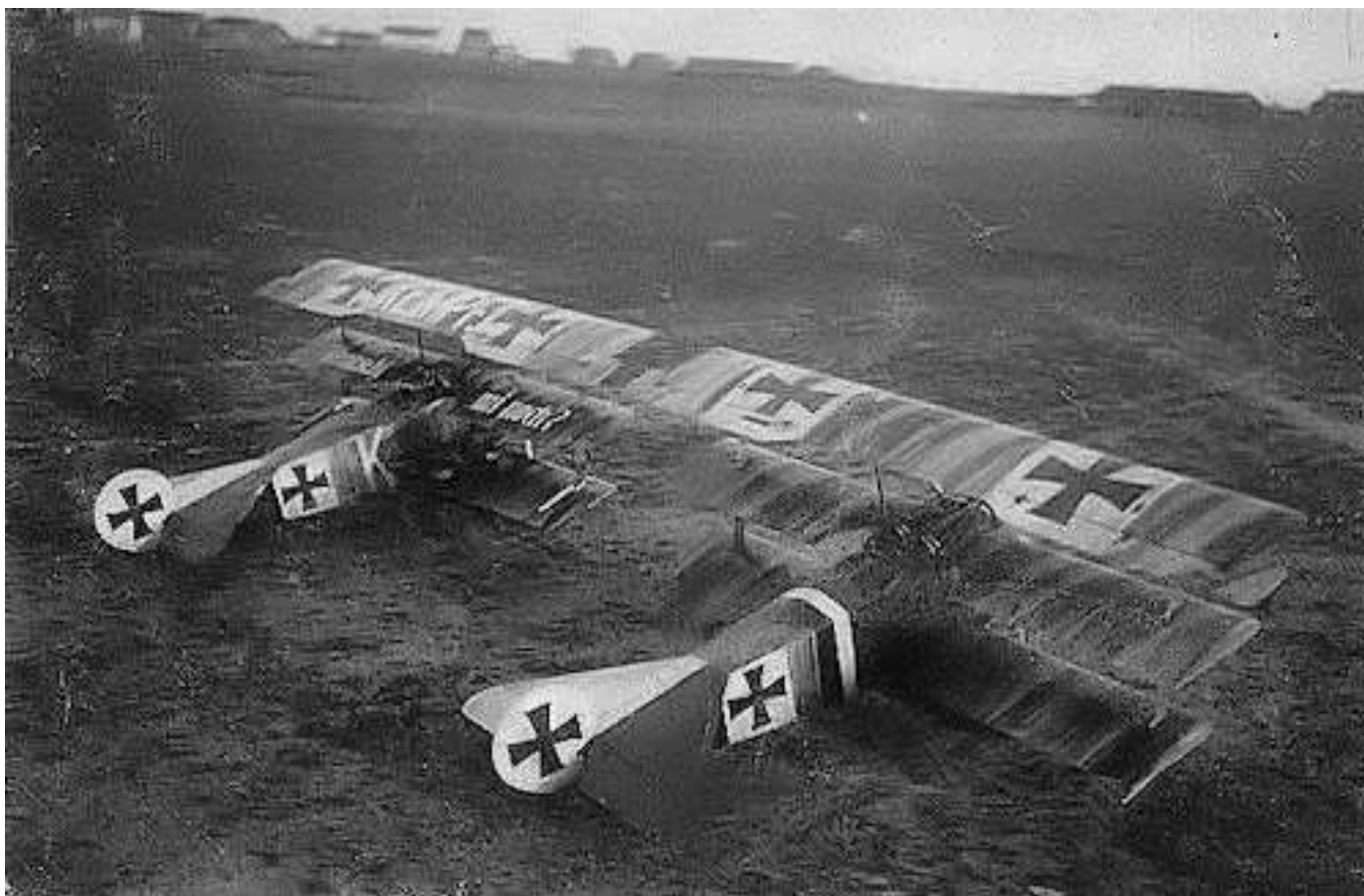
This model represents the Fokker DR.1 Triplane, Serial No. 214/17, as flown by Lt. (r) Wilhelm Papenmeyer, operating from Marcke airfield in March, 1918. On the 13th of March, 1918, this aircraft was badly damaged and written off after an airfield attack by bombers of the RFC. In all six aircraft were either destroyed or damaged and five personnel were killed with eleven others injured. Several days later the unit moved to the airfield at Erchin, south-east of Douai. Here Papenmeyer received a replacement and last aircraft, Serial No. 409/17, which he had painted in a similar colour scheme to the previous aircraft, except the coloured fuselage bands more to the rear of the fuselage.

Some resources state that there were two coloured fuselage bands, others that there were in fact three. Both the earlier aircraft 214/17 and the later 409/17 had coloured fuselage bands. Again some resources state the colours were black and white, whilst others state they were black, white and red, depending on the particular aircraft serial number. I have chosen to use the colours of black, white and red, as the most common depiction of the coloured bands, based on the German Empire's national colours of that period. Most WW1 data on aircraft colour schemes is at best conjecture and particularly concerning the what colours are and with regard to the later Fokker aircraft, the streaked camouflage applied. Again, some state it was an 'olive' coloured streaking, others it was more 'brown' in colour. The colour scheme I have applied to this model is the one I prefer, accurate or not..

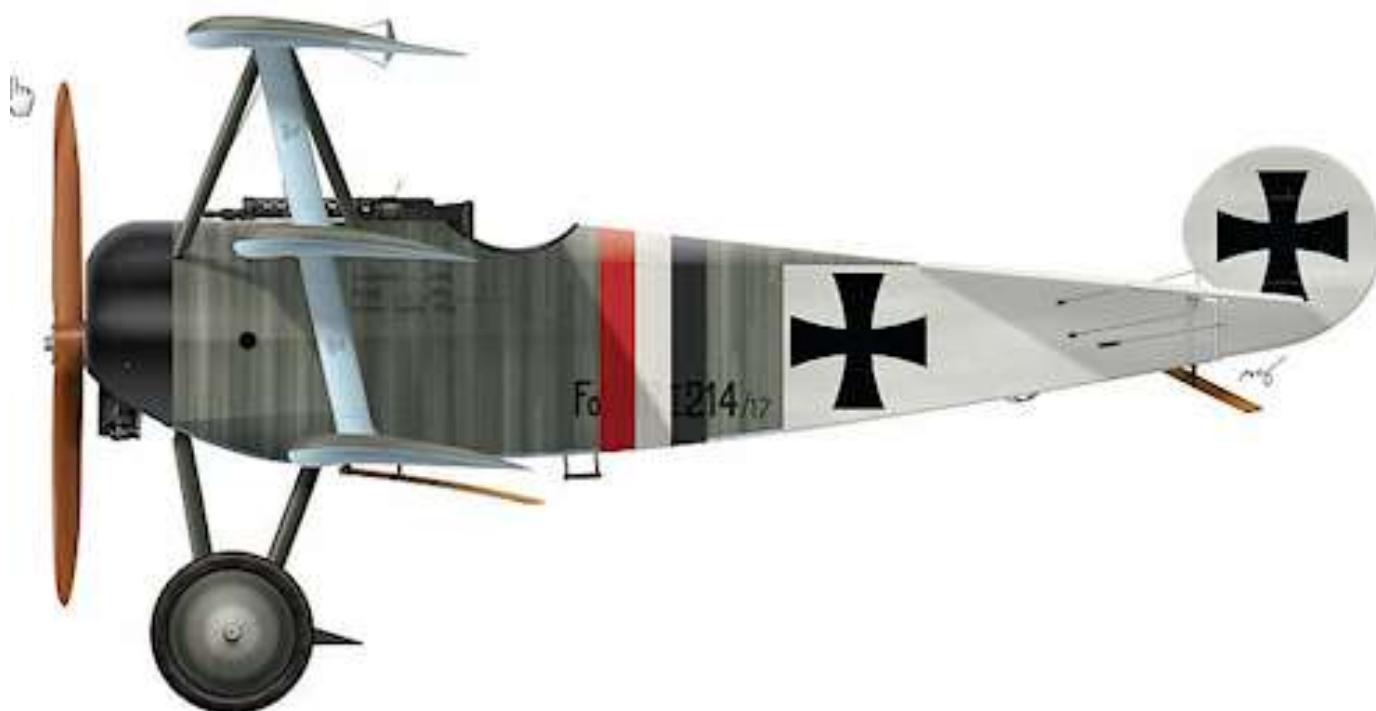
This photo shows what could be three fuselage bands.



This photo shows what could be just two fuselage bands.



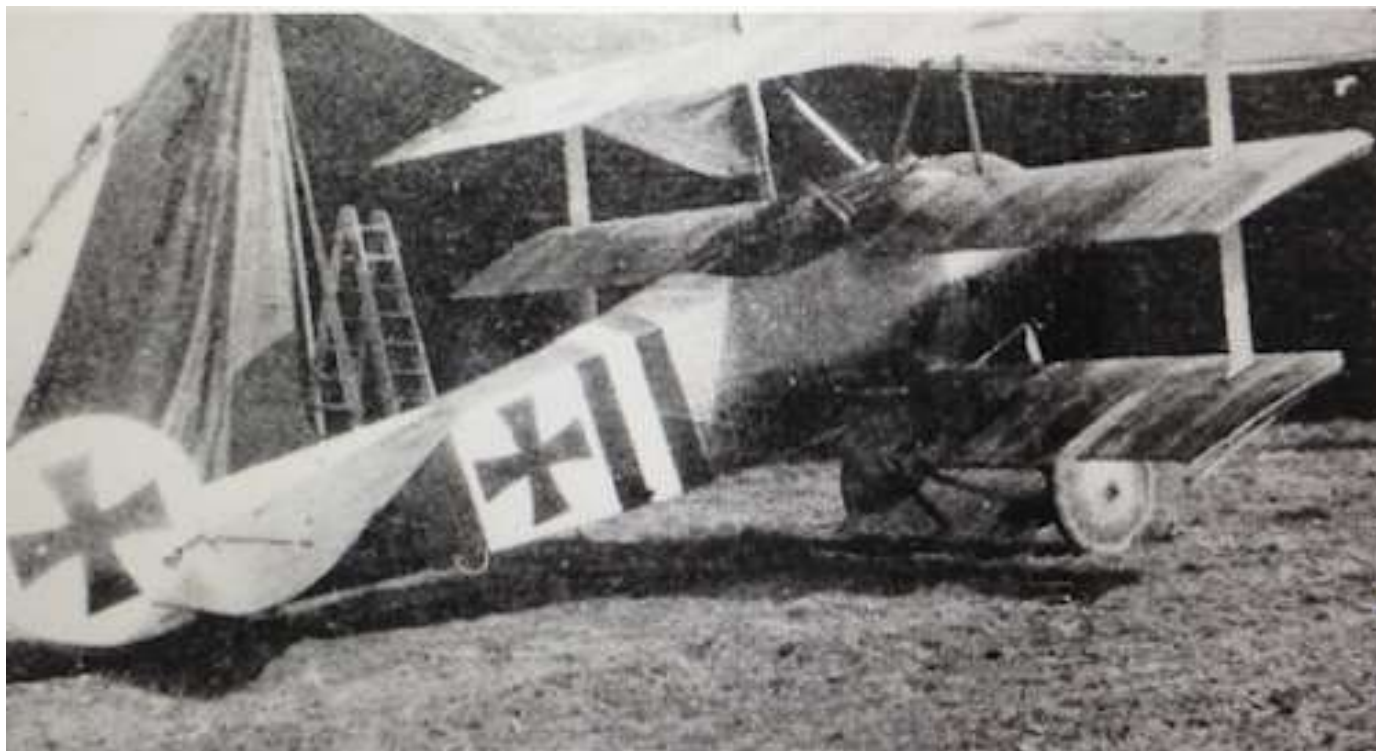
This profile shows three bands, although I believe the red and black band positions should be reversed.



These profiles show three fuselage bands, which I believe are in the correct order, as per the national colours of the German Empire in that period.



This photo shows what I believe is the later aircraft (409/17) as the fuselage bands are further back on the fuselage.



PART 1 - THE MODEL (GENERAL)

(Roden Kit No. 601)

Roden kits are generally accepted as being at the top end of the market and this model is no exception. The parts are manufactured from traditional 'plastic' and are not resin. There is minimal mould flash that needs to be removed and also virtually no ejection pin marks to worry about. The instruction and information sheets are fairly basic, but all you need to build this model. However there is no rigging diagram included, however rigging of this aircraft is easily obtained from books or the internet. Colour profiles of the aircraft are provided as are their associated decals.

Model Corrections:

It seems there are various errors in the original kit. These are listed below, from various sources including the excellent build log of Claudio Kalisinski, which can be purchased from the 'Modeller Site' and which I've employed in this build. *To avoid breeches of copyright or plagiarism*, I have not included in this build log details of how these errors have been corrected (as detailed in Claudio's build log), but generally, some of the areas covered are listed below, plus others I've found (detailed in this build log). To do this model justice I would advise you to obtain the PDF copy of Claudio's build log.

1. Fuel/oil tank - oil filler on the starboard side.
2. Machine gun blast protection plates.
3. Internal plywood side fairings.
4. Top wing window for ZAK data.
5. Kit instructions - Items labelled incorrectly.
6. Axle wing fairing.
7. Engine cowl.
8. Tailplane horizontal stabilizer.
9. Compass Deviation table.
10. Interior colour.
11. Cockpit fuel pump.
12. Undercarriage struts positioning.
13. Engine valve push rods.
14. Engine bulkhead.
15. Moulded control openings.

16. Packing studs on wing leading edges.
17. Undercarriage and Cabane Strut bracing.
18. Undercarriage axle 'bungee' suspension.
19. Wheels.

General Observations:

20. If you model an aircraft from Jasta 2 (Boelcke), note that their aircraft had white faceplates on the black engine cowl.

21. Jasta 2 (Boelcke) had additional bracing fitted to the undercarriage fairing.



22. **NOTE:** The model in this build log is that of Wilhelm Papenmeyer of Jasta 2 (Boelcke), which is not one of the colour schemes supplied by the kit.

If you decide you are doing the **Kempf colour scheme**, you'll need to ensure the scheme (he had two very similar schemed aircraft) matches the supplied decals. Those supplied in the kit depict the later colour scheme.

Earlier Colour Scheme:

Top wing lettering of 'KEMPF' is white and not outlined.

Fuselage letter 'K' white or possibly yellow.

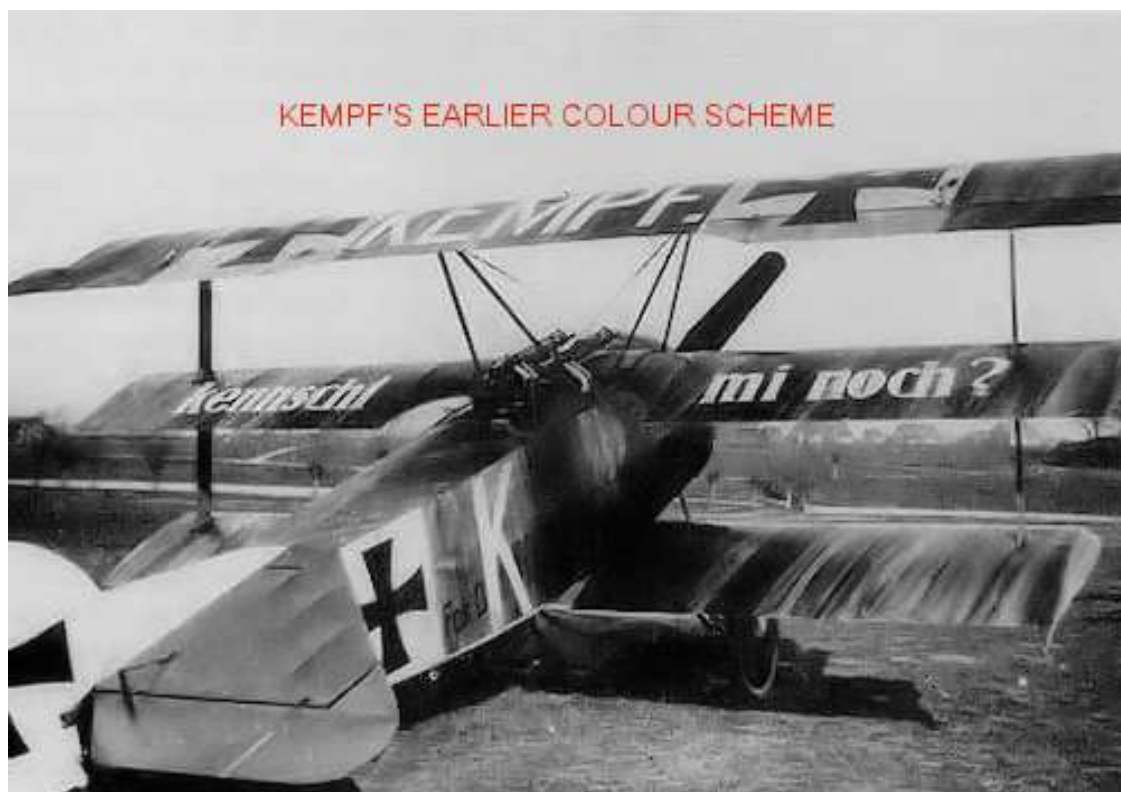
Streaked camouflage runs straight back over wings and down fuselage sides and is only streaked diagonally on fuselage top.

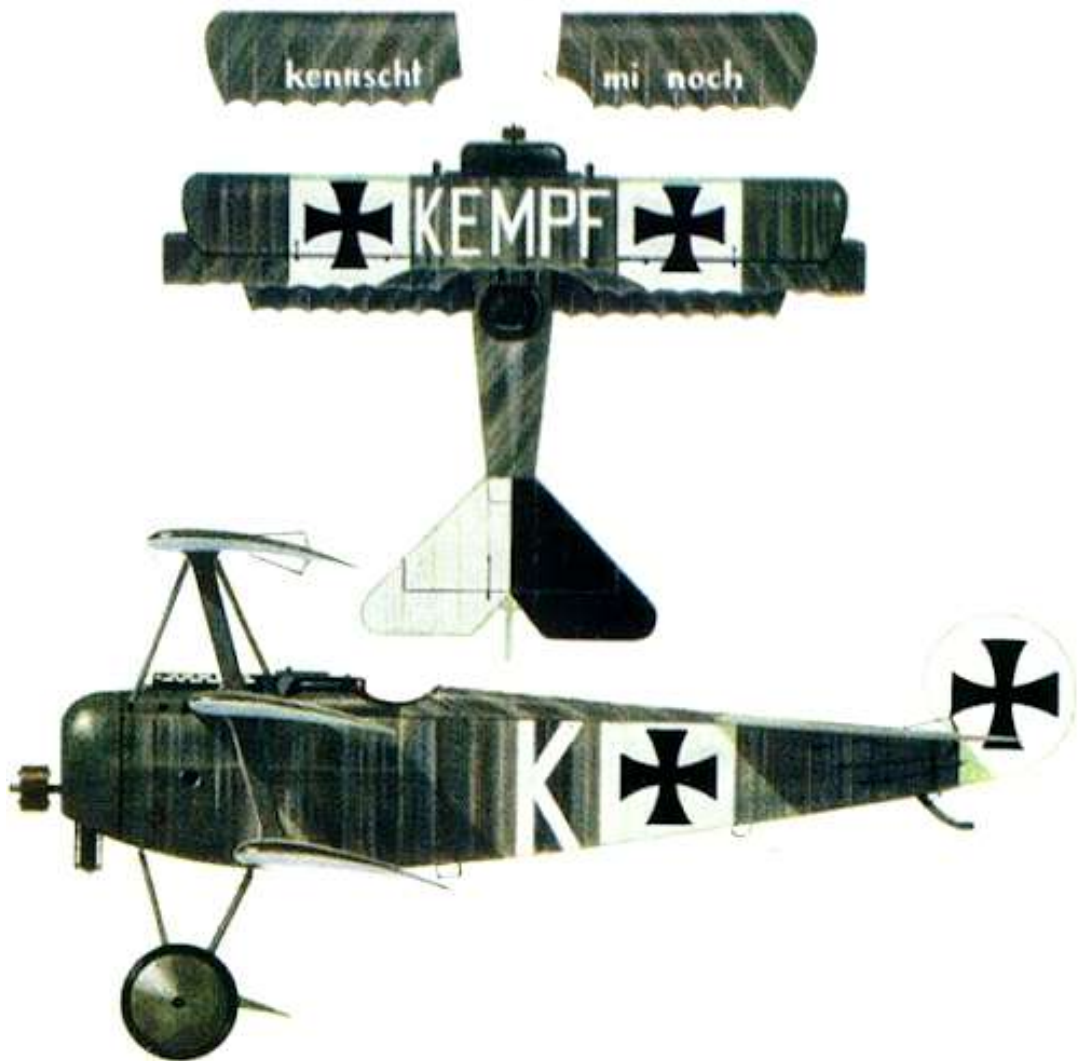
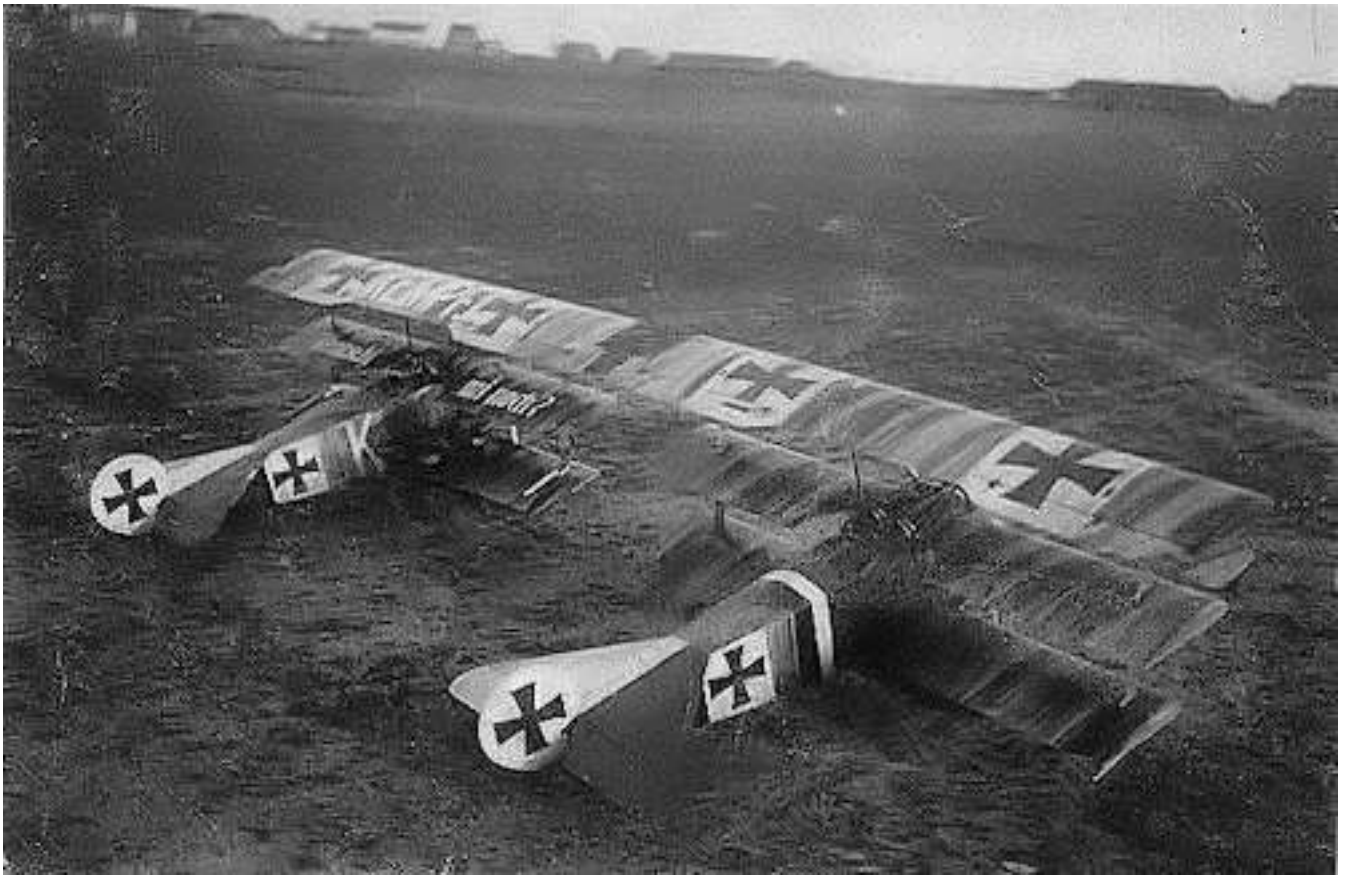
Rudder has no outlined border around the edge.

Horizontal tailplane and elevators are opposing black and white (top/bottom).

Engine cowl is black with a white facing (as for Jasta 2 'Boelcke' aircraft).

National markings are the 'Balkan' Cross.





Later Colour Scheme (during March 1918):

Top wing 'KEMPF' is white and outlined in black.

Fuselage letter 'K' is yellow and outlined in black.

Streaked camouflage runs diagonally across wings and down fuselage sides.

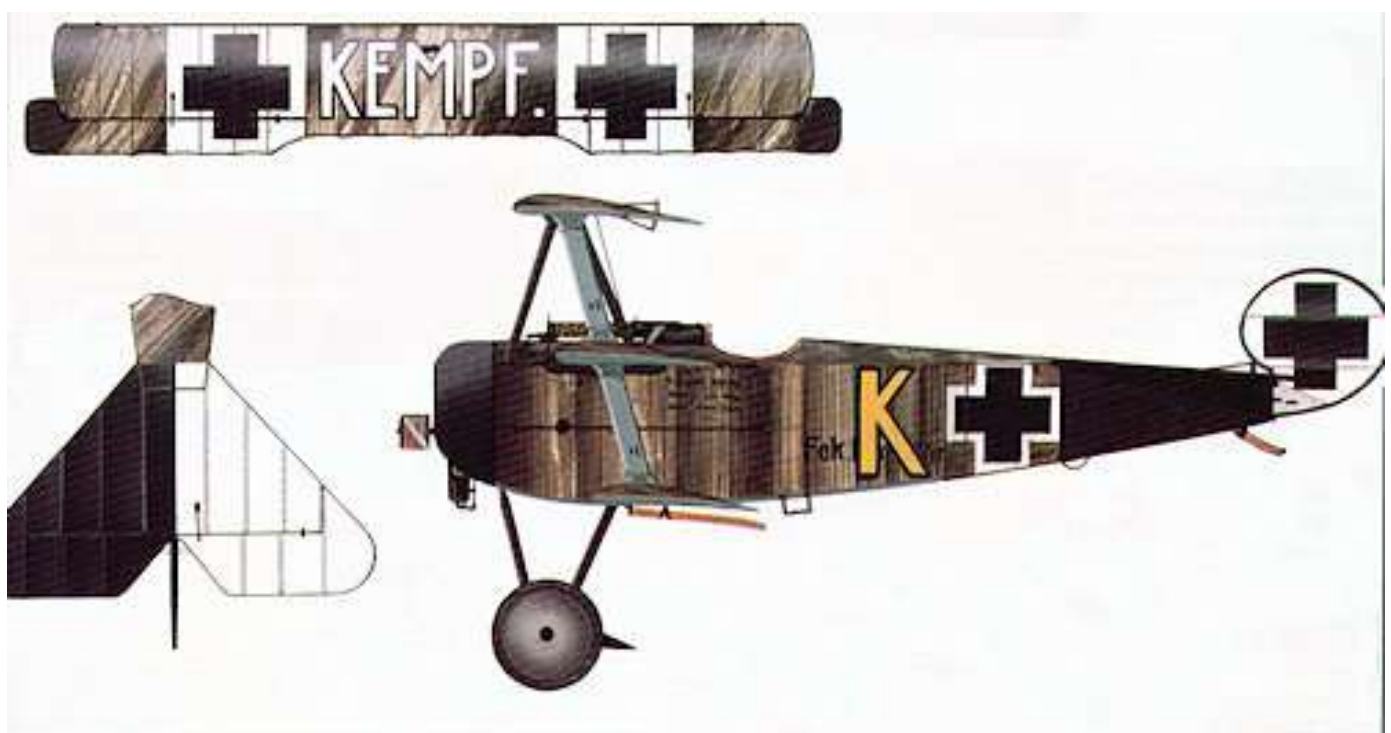
Rudder has dark outlined border around the edge.

Engine cowl is black with a white facing (as for Jasta 2 'Boelcke' aircraft).

Horizontal tailplane and elevators are opposing black and white (top/bottom) - opposite to the earlier colour scheme.

Fuselage rear sides are black and white—opposing top scheme on the horizontal tailplane.

National markings are the 'Eiserne Kreuz' (Iron Cross).

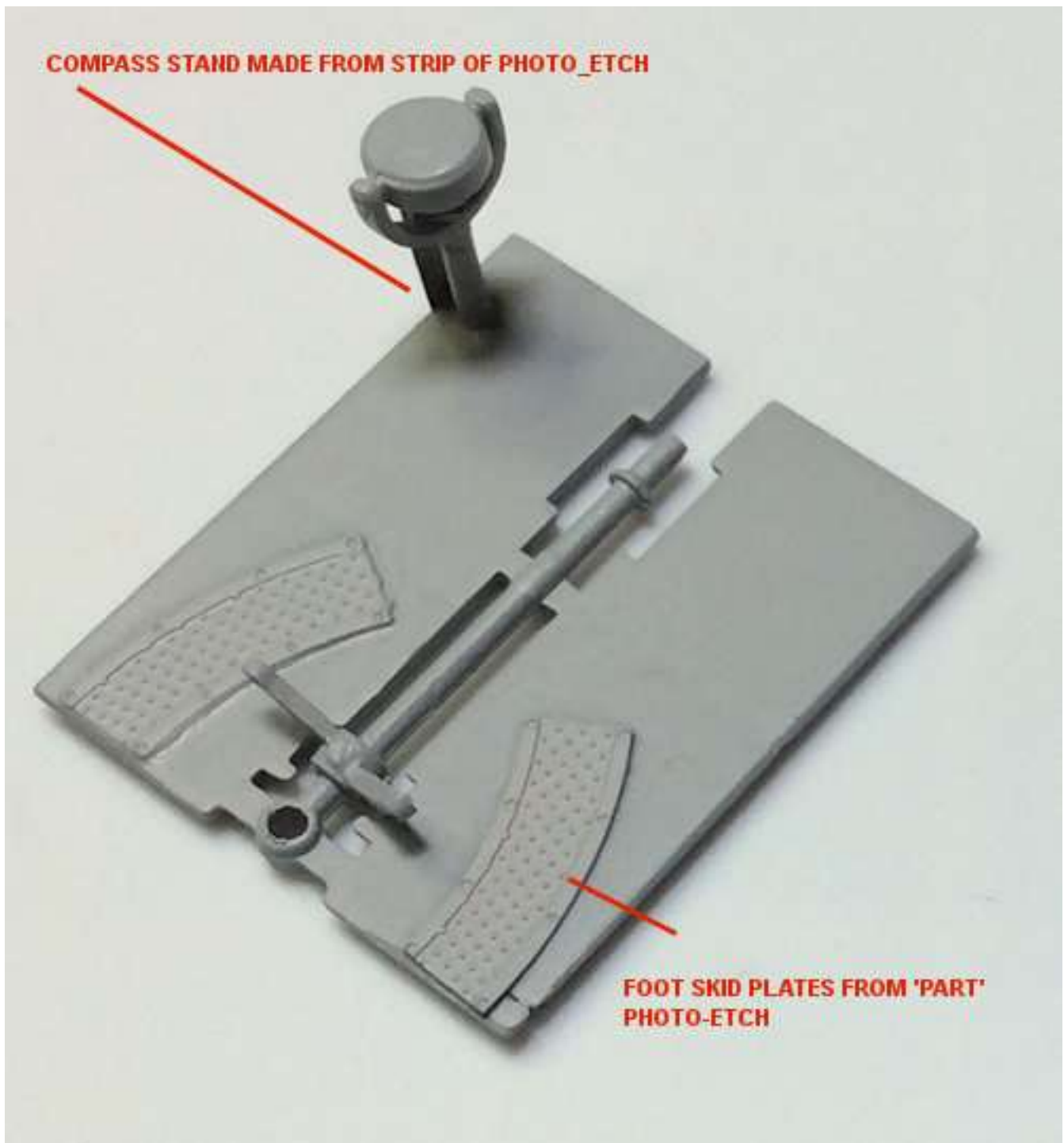


PART 2 - THE COCKPIT

Before assembly I made the compass support from spare photo-etch, cut as a strip and then bent to fit to the cockpit floor side and under the compass itself.

In addition the pre-moulded foot skid plates were removed and replaced with those supplied in the Part No.32028 Fokker DR.1 (1/32) photo-etch sheet.

Both were secured using CA adhesive.



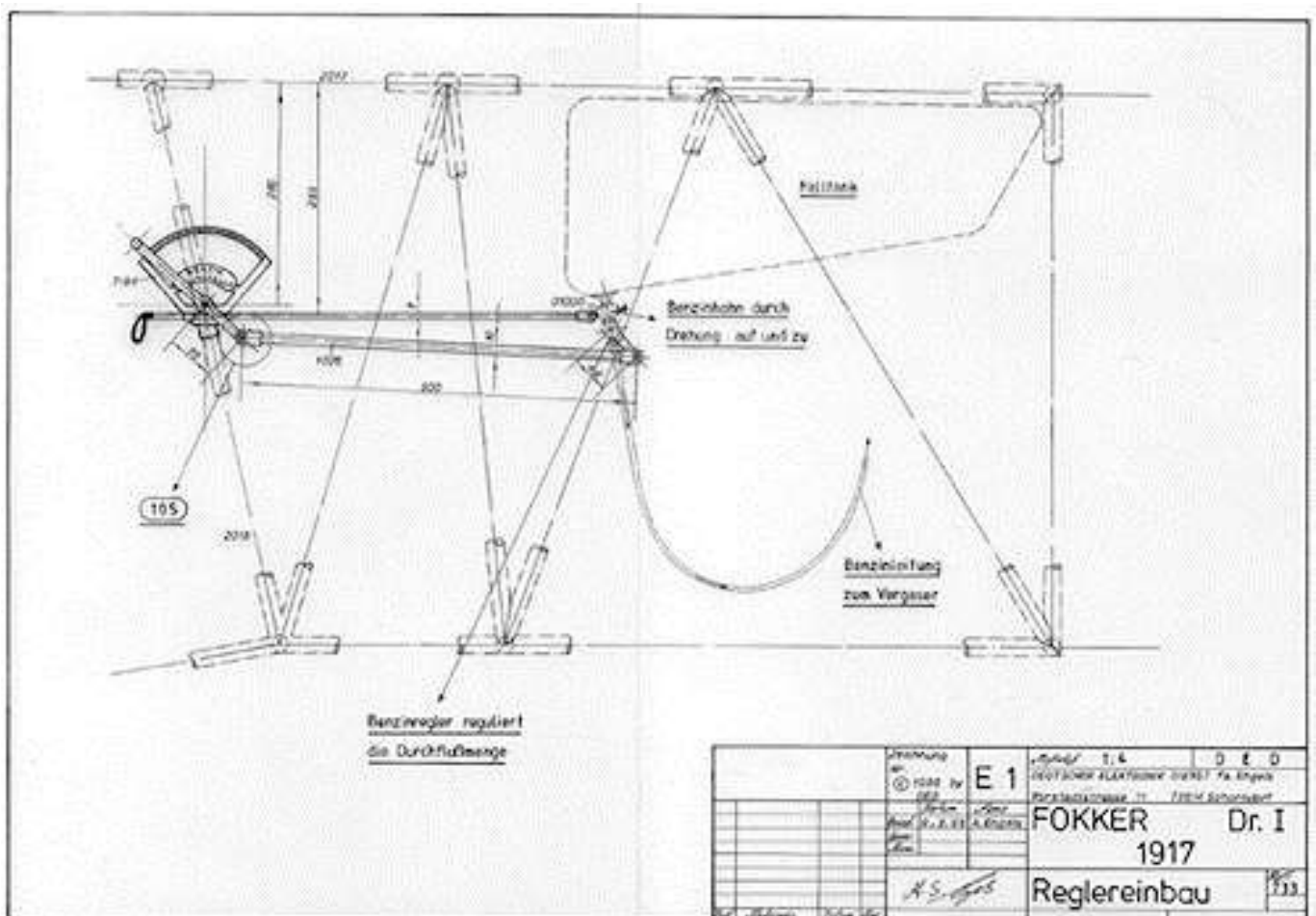
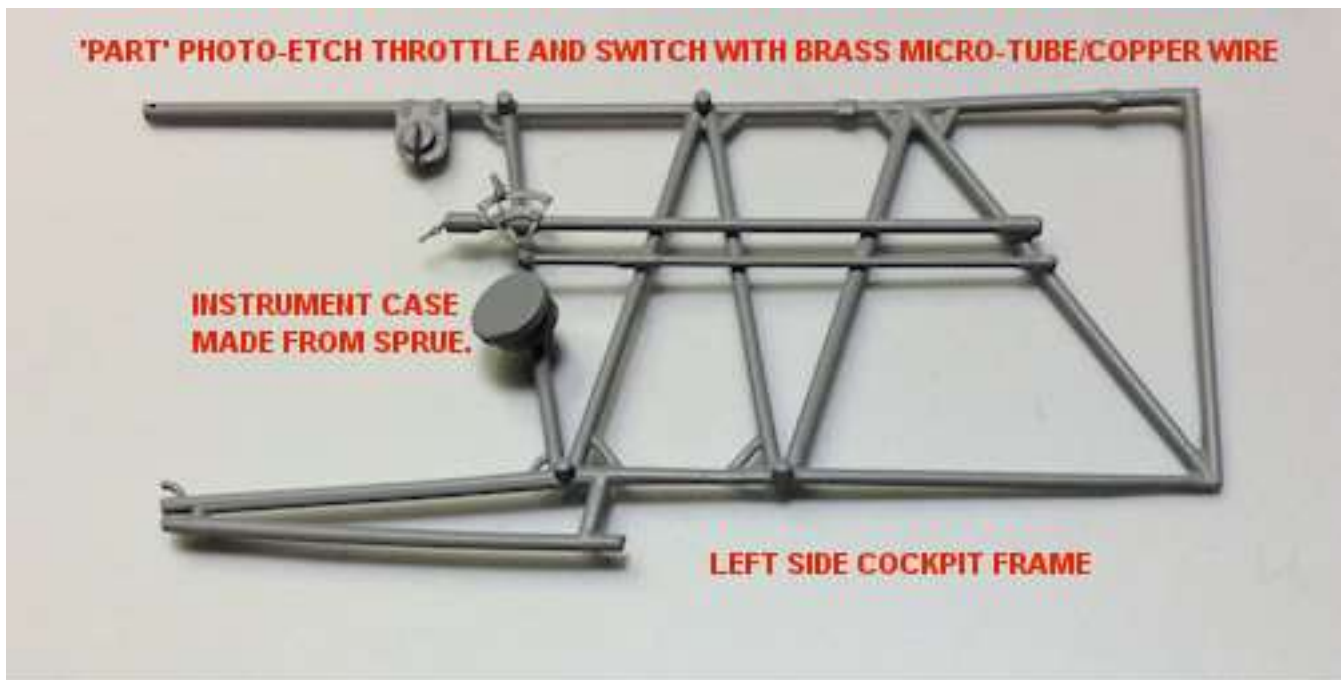
The kit does supply the two inner wood panels for the left and right fuselage sides. Those supplied in the Part No.32028 Fokker DR.1 (1/32) are not to the correct size.

I made the panels by cutting them from 0.2 mm plastic sheet, making sure they fitted correctly when formed against the fuselage sides. The support struts were cut from plastic rod and secured in position with Tamiya Extra Thin adhesive. Securing fasteners will be added later in this build.

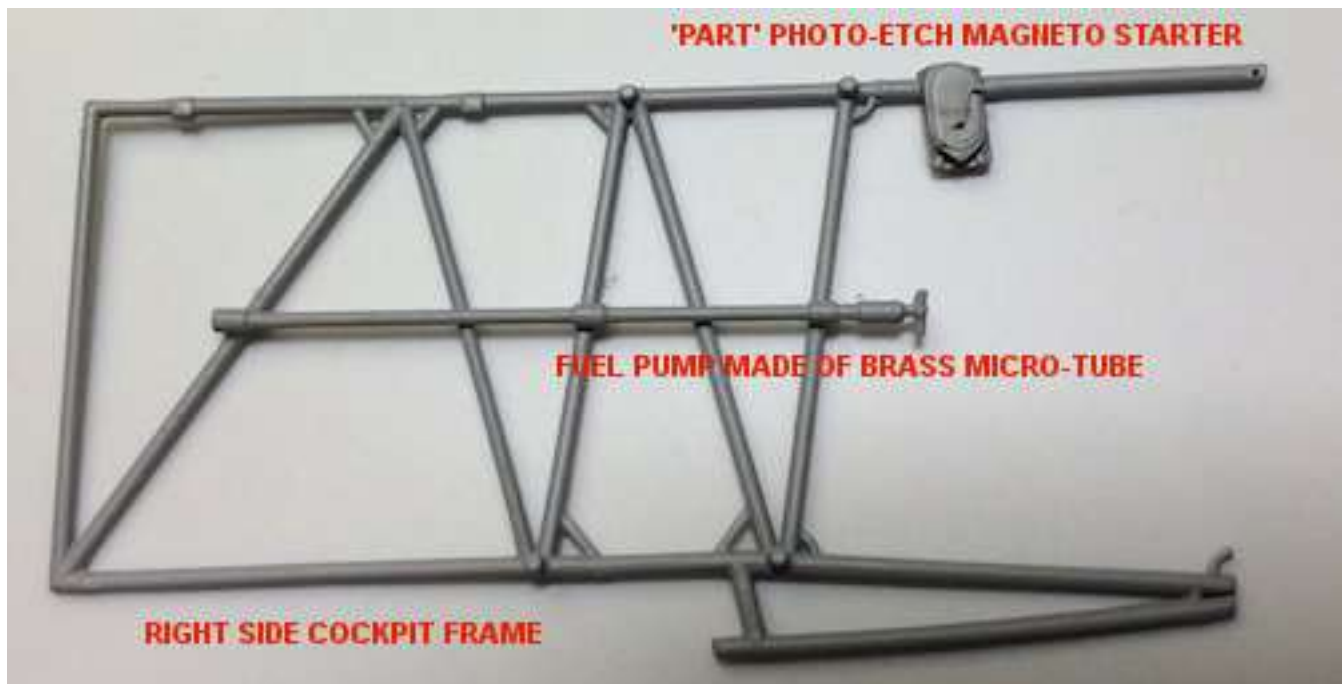
The actual aircraft has two metal panels fitted, one inside and forward of the cockpit floor and the other external on the bottom of the fuselage and to the rear of the engine. These were cut from 0.2 mm plastic sheet with micro-tube used to represent the panel hinges. Recesses were punched into the panels for their retaining screws. Two holes were cut into the leading edge of the external panel to allow the fitting of the forward undercarriage struts.



The kit supplied left cockpit frame required modification to correct the throttle controls and to add an extra instrument and switch.

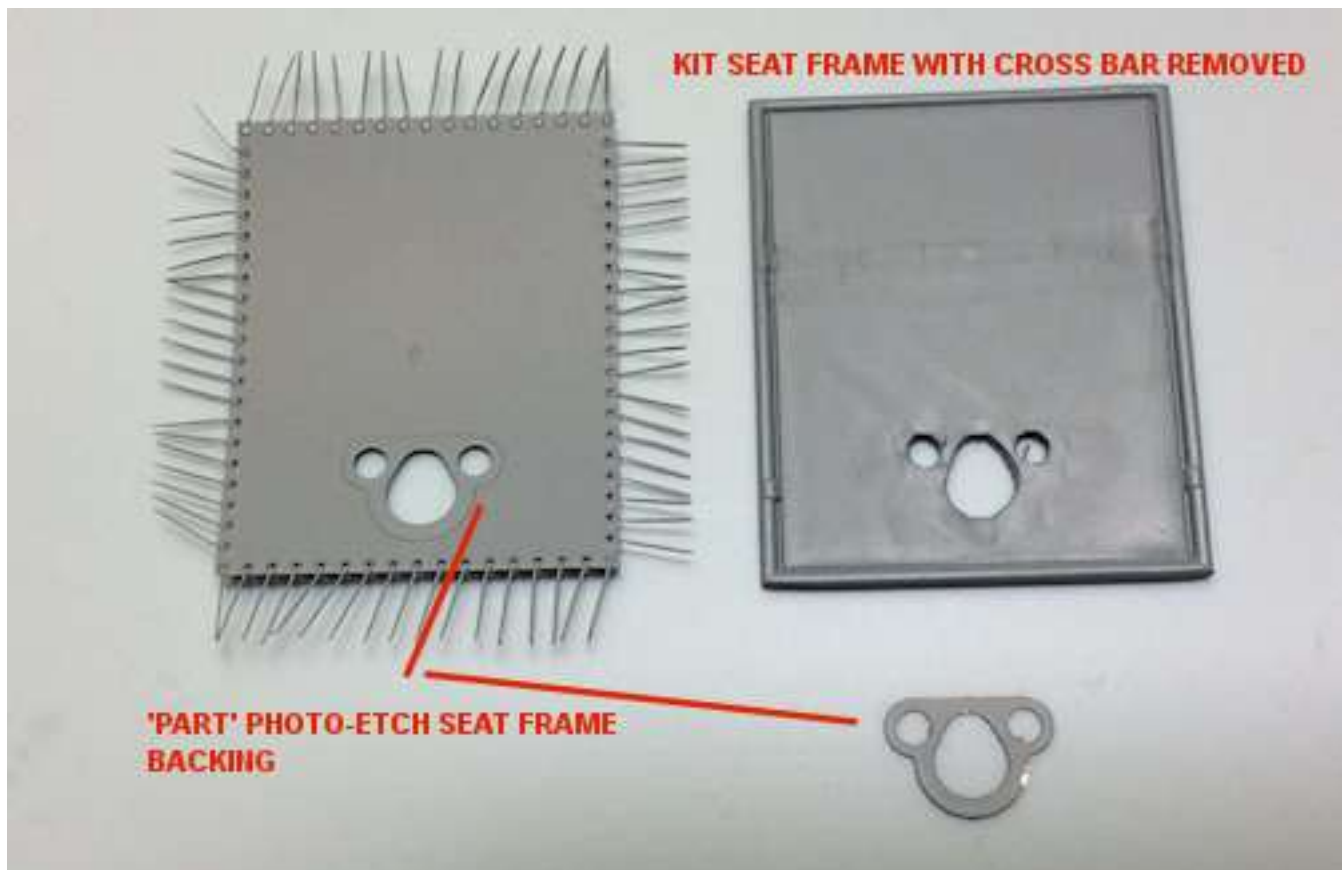


The kit supplied right cockpit frame required modification to correct the fuel pressure pump and location of the magneto starter.



The kit supplied seat frame was modified by sanding off the pre-moulded cross bar. The frame fabric backing was from the Part No.32028 Fokker DR.1 (1/32) sheet, as was the control cable anti-chaffing insert..

The frame cross bar will be added later in the cockpit build, along with the seat support frame.



The kit supplied cockpit seat was enhanced by adding a seat cushion, made from modelling putty and edged with 'pipping' made from thin lead wire.

The kit supplied seat support frame was discarded and instead, replaced with one made from plastic rod, and painted with Mr. Metal Stainless Steel (see photo on page 27).

**KIT SEAT WITH MODEL PUTTY SEAT CUSHION.
CUSHION EDGE BEADING FROM LEAD WIRE**



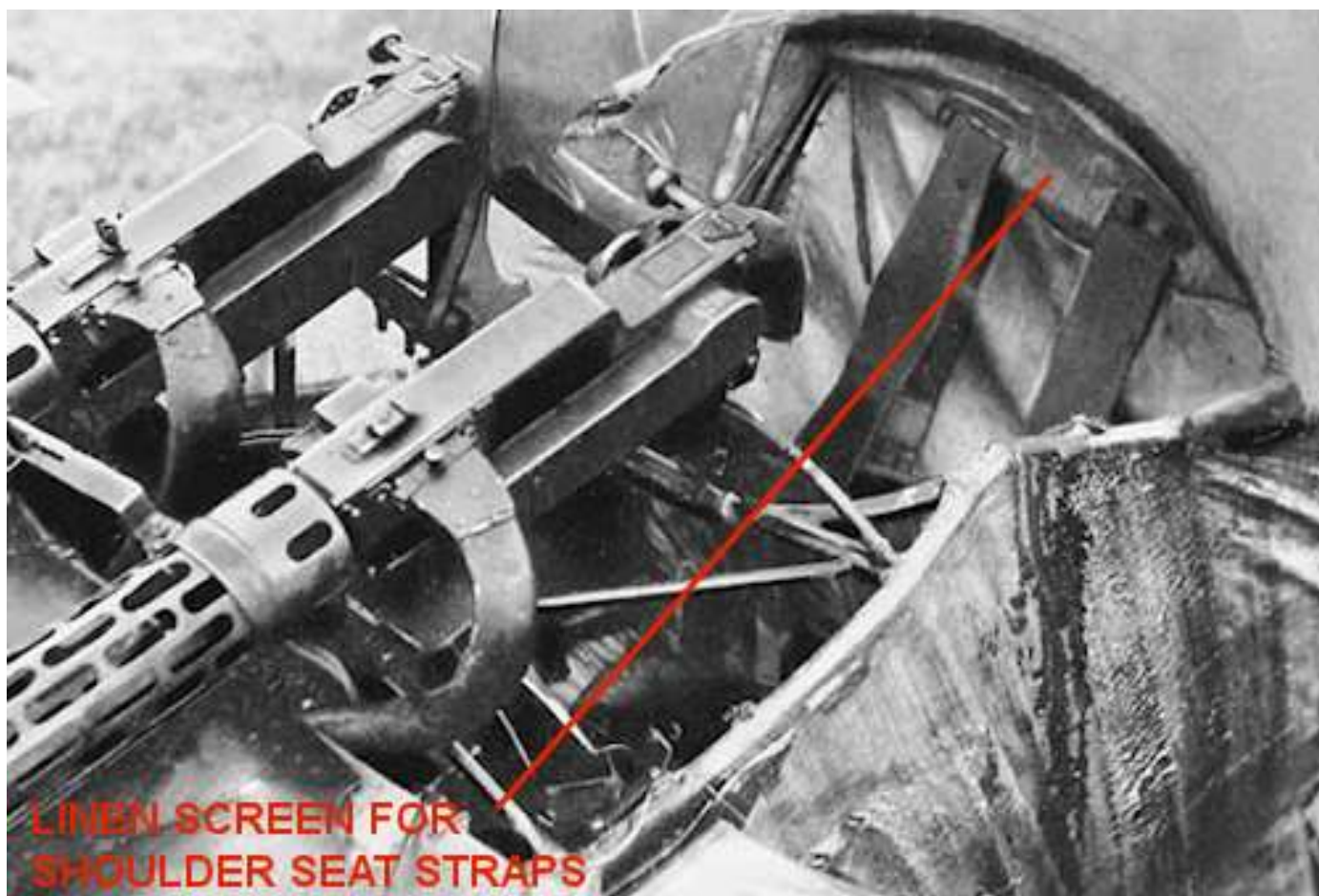
The kit supplied control column has to be fitted into the cockpit floor and to both cockpit side frames. To ensure this align, I cut the control column and added a short length of brass micro-tune (1.0 mm diameter, 0.8 mm internal diameter) to enable the two halves to be adjusted in height before fixing in position. The bottom half also had two lead wires attached to replicate the gun synchronisers (the top halves of these will be added later in the build).



I printed a compass deviation placard for the front of the ammunition box closest to the pilot.



The actual aircraft had a linen 'screen' at the top of the seat frame, through which the two shoulder seat belts were fitted. I made this from plastic sheets and cut two slots, over which I added two photo-etch 'surrounds' from the Part No.48087 (1/48) set.

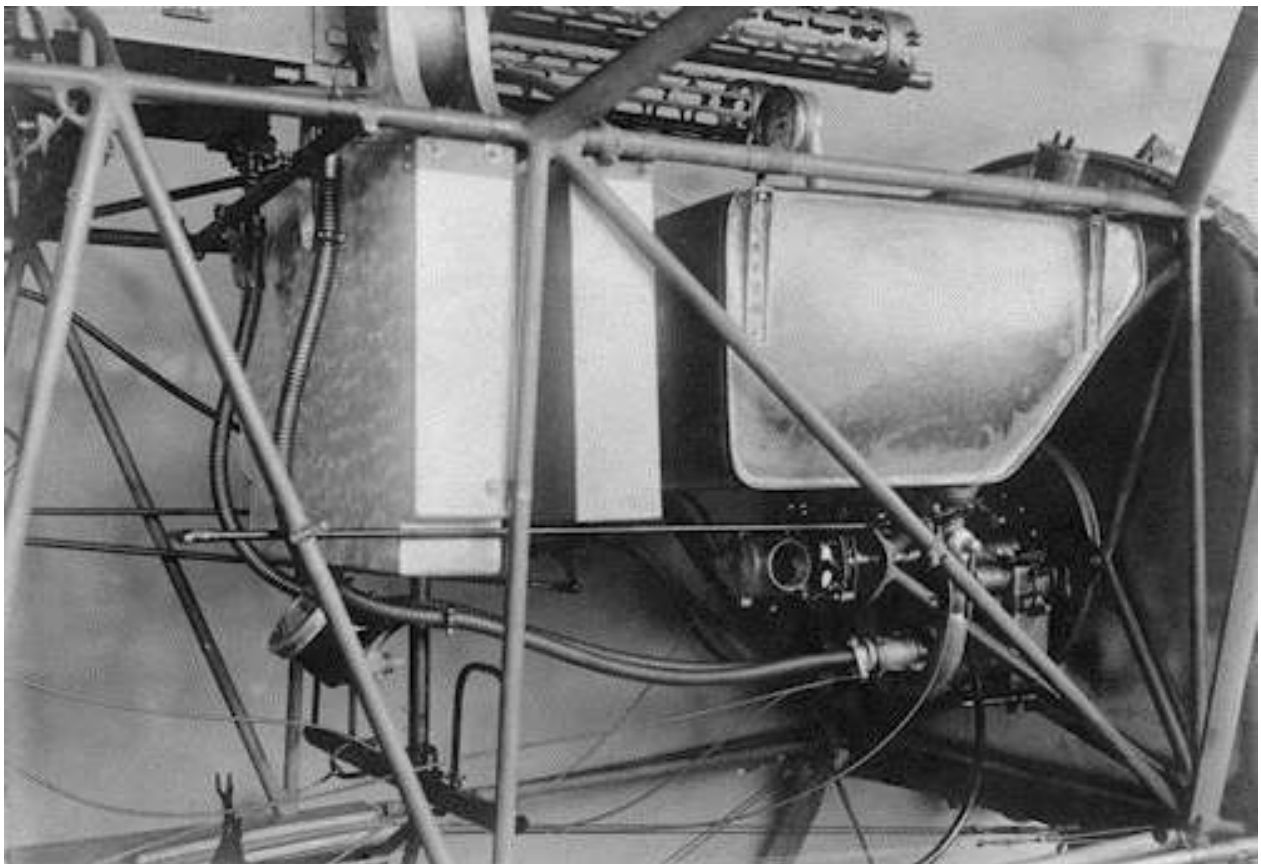


The aircraft fuel tank, as supplied in the kit, has the fuel filler on the forward, left side of the tank. However, there should be an oil filler on the right side.

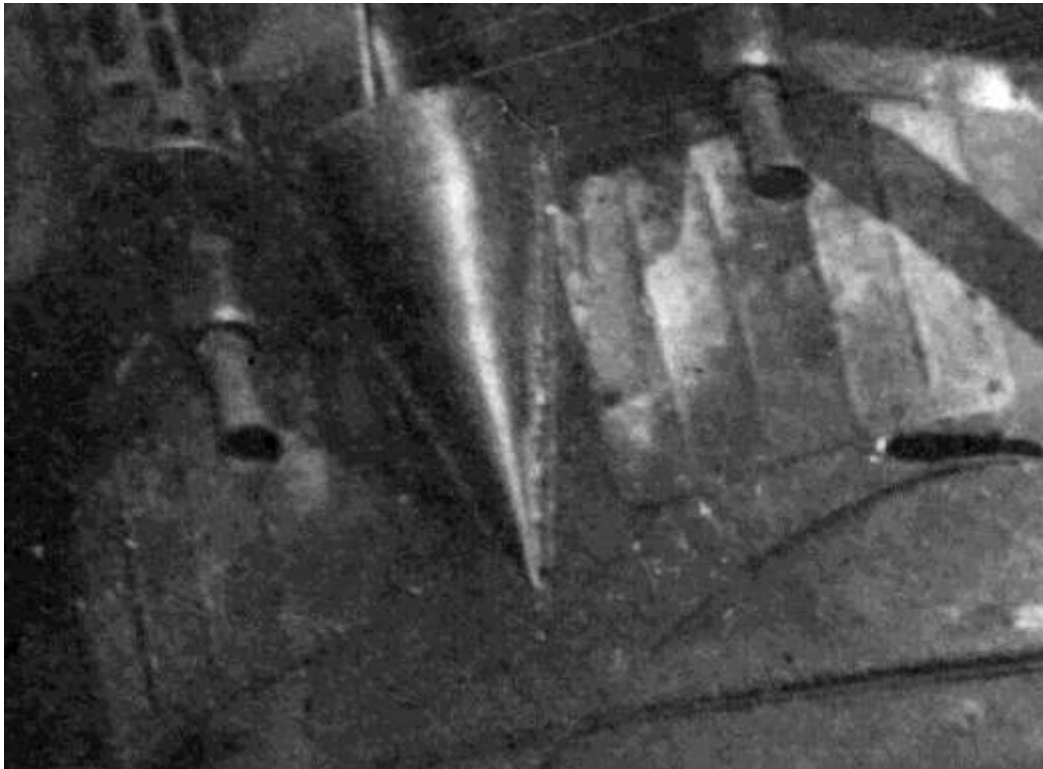
I drilled a hole through the forward fuselage upper decking for this filler, which will be made and fitted later in the build.



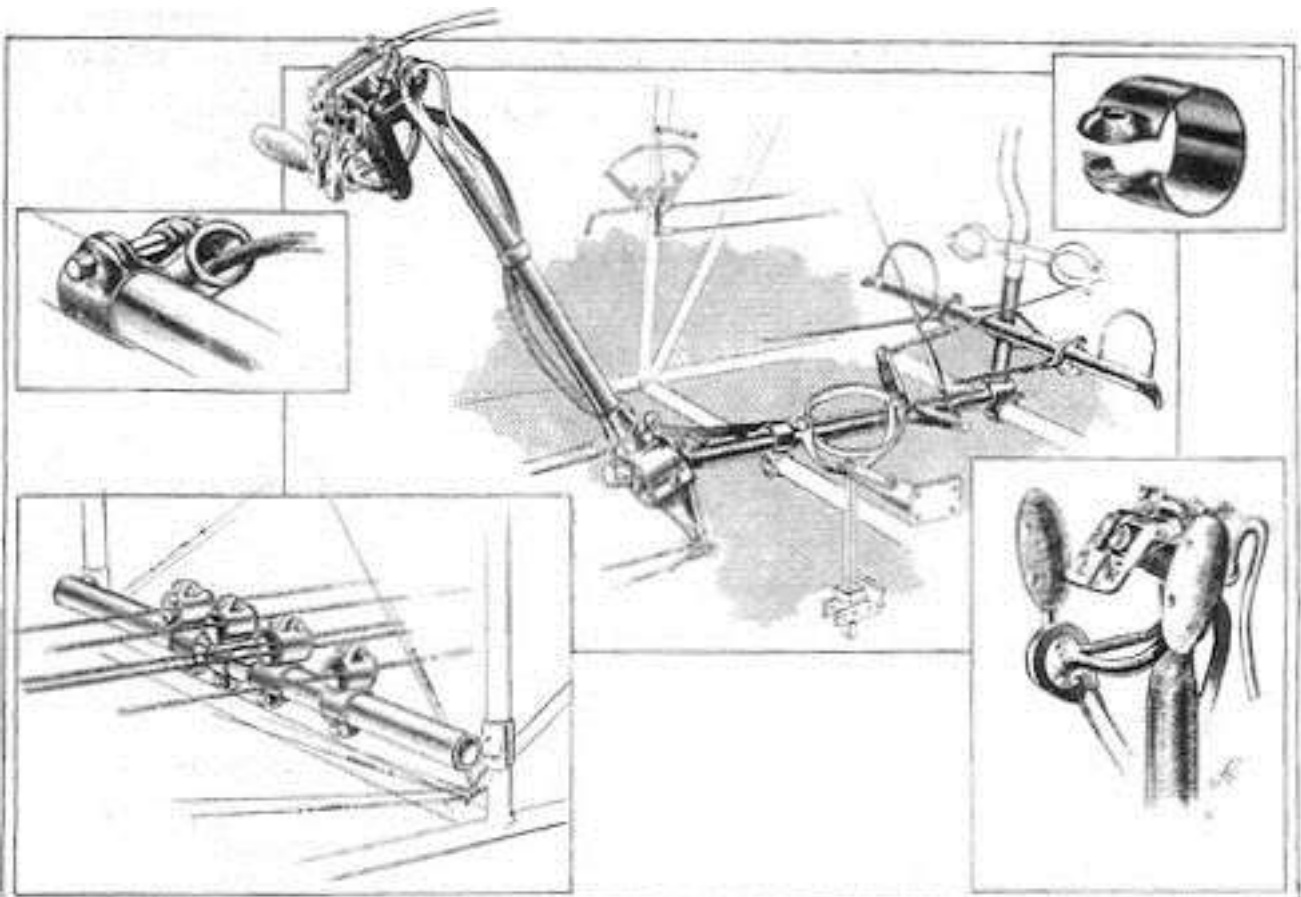
The following photograph shows a typical Fokker DR.1 cockpit. Note the two cables for the gun synchronisation cables running from the guns, to the control column and then onto the rear of the engine.



The two blast plates for the gun muzzles were made from 0.2 mm thick plastic card and the corrugations pressed in with a paper embossing tool.



If you intend to show the finished aircraft model with ailerons and/or elevator in anything but the neutral position, the controls will need to be positioned correctly.



Some modellers work the various pieces whilst they are still attached to the main sprue, but I prefer to remove the pieces first so that I can clean them up more easily. However pieces like the cockpit frames are delicate and can easily be damaged when being removed. If you cut them off with snips, scissors or a blade etc, they can either break or get stressed at the cut point, which causes 'white' stress and/or deforming. I prefer to cut them away using a fine modeller saw, which I find has a more gentle cutting action.

Despite being a Roden kit, there are still fine moulding lines around items like the cockpit frames, but they are only slight and are easily removed using a sharp blade or sanding stick. I use a straight edged scalpel blade to gently scrape off the mould lines. Some of the model items, particularly in the cockpit, are very small and can easily 'fly off' when being handled, so take care. Remember to drill any holes needed for rigging or control lines (study the kit rigging by reference to the kit diagram or other data).

Once the items have been removed from the sprue and prepared, they should be gently washed in warm, soapy water, to remove any mould release agent remaining on the items. I use an old toothbrush to do this. Once dry they can be primed ready for painting. Primer can be applied by brush, airbrush or from aerosol cans. Although not the cheapest method to prime items, I prefer to use Tamiya's fine surface primer aerosol (light grey). It has good coverage as the base primer for acrylic painting. Take care when spraying the primer as applying too much will result in 'pooling' or 'runs', which would then need to be removed once the primer has dried. Make sure you spray in a well ventilated area or, if you have one, use an extractor booth.

To hold items for priming I use self locking tweezers or carefully insert a toothpick into the item. To hold small items I use a small piece of sticky putty, such as 'Blu Tack', on the end of a tooth pick. Once applied the primer dries quickly, one of the main advantages of using acrylic paints. rather than enamels etc.

Wood Effect:

NOTE: Tamiya Acrylic paints used, unless stated otherwise

Once the primer is dry, you can start applying the wood effect to the applicable cockpit items, such the framework, seat supports, rudder bar, instrument panel and of course, the wing struts.

To start, apply a suitable base colour. For most painting I use an airbrush and only resort to brush painting when dealing with small items.

For most wood effect, I use Wooden Deck Tan (XF78), suitable thinned with Thinners (X20A). Allow this base coat to fully dry (if you can't smell the paint, then it's dry).

For the next step I use DecoArt Crafters Acrylic (water based), Burnt Umber or Raw Umber, which is similar to Acrylic oil paint, but instead of being oil based, is instead water based. This paint is not as thick as oil based paint and is more creamy, so can be brushed and controlled more easily. Also, as it is water based, it's easy to clean your brushes, and if really necessary, can be thinned slightly with water. Also it dries as quickly as normal Acrylic paint, instead of taking days, which is a disadvantage of using true Oil Paints.

Place a small amount of the oil paint onto a non-absorbent surface and using a suitable oil paint brush (I use a slightly curved brush), wipe a small amount of the paint onto the brush. Apply the paint to the applicable item, using light strokes and in the required direction (e.g. along a wing strut, not across the strut). Only apply a light coat as a second coat, if required, can be applied once the first coat has dried (I applied a second light coat for these items).

I apply the paint along struts and across instrument panels and other smaller items. This gives variation to the wood effect and for the wing struts, is correct for the direction of the wood grain. If you apply too much paint, just brush it off before it dries. Don't try to thin any applied paint with water as although it will lift the paint, it will build it up into clumps. Clean the brush in water. Once the oil paint layers have dried, the final top coats can be applied to give the final effect of varnished wood. Tamiya have 'Clear' coloured Acrylic paints, which are intended to be mixed with either Flat Clear (XF86), Semi-Gloss Clear (X35) or Clear (X22), to give the required finish but with a tint of the added 'Clear' colour. I use the Clear Yellow (X24) or Clear Orange (X26) to add a varnished tint to the clear coat. However, I don't use the Tamiya Clear, but instead use Alclad 2 Lacquers. In this case the Klear Kote Semi-Matte (ALC 312).

Although it's a lacquer, I've found that it will accept Tamiya 'Clear' coloured Acrylics without separation, which can happen with other mixed-in paints. The Alclad dries fast and provides a good sealing layer over the painted surfaces. When using Alclad sealing coats, the golden rule is to allow the various painted surfaces to dry fully before applying Alclad lacquers.

In this instance, I added a few drops of Clear Yellow (X24) into Alclad Semi-Matte and thoroughly mixed it. Only add small amounts to the Alclad in order to control the amount of tint you desire. I increased my airbrush air pressure to around 20 PSI and then airbrushed the sealing coat over the various cockpit items. The first coat dries to a more matte finish, which I assume is due to being sprayed onto the Oil paint, rather than onto straight Acrylic paint. Once this coat has dried, I airbrushed a coat of just Alclad Semi-Matte, which added a second sealing coat, but more importantly gave the desired semi-gloss 'varnished' finish I was after.

Once the last layer of airbrushed Alclad Semi-Matte has dried, you can start to paint the smaller items in the cockpit. These items are brush painted using Tamiya acrylics and Mr. Metal paint. White Spirit is needed to clean brushes used with Mr. Metal paint, as Tamiya's X-20A doesn't touch it. This leads me to believe Mr. Metal paint is enamel based, rather than acrylic.

For small items I brush Mr. Metal paint, rather than airbrush. It can be airbrushed for larger areas, but care is needed to thin the paint correctly, otherwise I've found it can clog the airbrush. Once you have brush painted an item and once it has fully dried, the painted surface can be 'burnished' by gently rubbing the surface with a cotton bud, piece of cloth or even your finger. Doing this merges the pigments of the paint to create a realistic metallic sheen.

To paint the various cockpit items, I used Tamiya X18 (Semi-Gloss Black), XF16 (Aluminium) and Mr. Metal (Stainless Steel, Brass and Copper) and for the cockpit framework and additional floor panel, a mixture of Tamiya Cockpit Green (XF71) and Medium Blue (XF18).

For the seat I used Alclad Aluminium (ALC 101) and for the seat cushion Tamiya Hull Red (XF9) and Humbrol Leather (62).

The seat support frame was painted with a mix of Tamiya Cockpit Green (XF71) and Medium Blue (XF18). The added photo-etch 'fabric' (Part No.32028 Fokker DR.1 (1/32)) was airbrushed with Tamiya Deck Tan (XF55) and the control access cover with Tamiya Hull Red (XF9).

For this build I decided to use the seat restraint straps supplied as part of the photo-etch Part No.32028 Fokker DR.1 (1/32).

Once you've separated them from the fret and cleaned up any edges, you'll need to soften the brass PE straps in order to be able to bend them into the desired shape on the seat. This is 'annealing' the metal by applying flame heat (e.g. a candle or lighter) gently over the PE and as soon as it visibly changes to a greyish colour, remove the heat and let it cool naturally. Now the brass can be more easily shaped. Be careful not to apply too much heat or linger over small, delicate parts, or you may actually melt the piece!!

Once cool, test fit the straps and bend them to the required shape. Once you're happy with the shape and fit, carefully remove the straps and apply primer. When the primer has dried, paint the straps

Again I used Flory clay wash to weather the straps and after, secured them in position on the seat, using thin CA glue.

Use the normal method of applying the decals to the instruments. When a decal is in position press out any surplus water, using tissue paper or a cotton bud. Once this is done, brush a small amount of MicroSet over the decal surfaces, as this will soften the decals and cause them to 'weld' to the painted surface. Don't be alarmed if the decals wrinkle at first, as this is the MicroSet taking effect and the wrinkles will disappear once dry. Once dry I trimmed the edges before adding photo-etch instrument bezels from Airscale Instrument Bezels (PE32 BEZ).

Applied weather was a mixture of Flory Dark Dirt clay wash and AK Interactive 'Leaks and Stains' wash.

Internal frame rigging and flight control cables were made from 'Steelon' Mono-Filament 0.12 mm diameter and Albion Alloy 0.4 mm Nickel Silver micro – tube.

The cables for the starter switch, magneto starter, instrument, control column and gun firing were made from thin lead wire.

Once dry, all of the cockpit pieces were given a sealing coat of airbrushed Alclad Semi-Matte (ALC 312).

The following shot is of the fuselage halves, before closing up the fuselage. The control cables for the rudder (top and bottom of the control column), twin ailerons cables, gun firing and control column cables are left free so they can be attached correctly once the fuselage has been closed and the build progresses.



The following two shots are of the fuselage halves closed up. You can see the two thin lead wires, which will eventually be fixed in position as the gun synchronisation cables from the two machine guns to the engine. Also visible are the two pairs of aileron control cables, which are attached to the bell-crank on the control column torque tube. These will be finally fitted in position through the cockpit top decking to the top wing. The two rudder control cables are made from 0.3 mm diameter Albion Alloy's Nickel Silver micro-tube and were fixed in position after the fuselage halves were closed. Also visible are the added bracing struts for the two cockpit top cross tubes. These were cut from thin plastic rod. You can also see the printed compass deviation chart attached to the rear ammunition box.



PART 3 - THE FUSELAGE INTERNALS

As with most colouring for World War One aircraft, it's debatable as to the exact colours and tints. New aircraft colours would differ from those that have 'seen service' and age and the ambient conditions would have altered these colours. In addition, the chemical mixture of the various dopes changed throughout the war, due to short supplies of some of the ingredients and the particular aircraft manufacturers take on a particular colour specification. Most colour photographs are of museum aircraft and modern replicas, which may or may not be accurate depictions of the actual colour at the time.

The best we as modellers can achieve is what we, as individuals, consider is 'accurate'. For the painting of the wooden side fairings (refer to page 19).

After being primed, airbrushed Wooden Deck Tan (XF78), mixed with a few drops of the Clear Yellow (X24), to create the colour for Clear Doped Linen (CDL) inside the fuselage. A point to note is that despite the external fuselage finish (lozenge, streaked etc), the inside surfaces remained clear doped linen).

Flory Model clay washes come in various shades and consist of a very fine clay pigment. They are brushed over the surface to be weathered and dry in around 30 minutes. When dry, use either a piece of good, absorbent kitchen roll or a brush used for oil paint (as the bristles are harder than normal painting brushes) to remove as much of the clay wash as you need to achieve the desired effect. The damp re-activates the clay wash and allows it to be removed or worked as required.

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. The wash I used was a mix of Flory Clay Wash 'Light' and 'Dark Dirt'.

Whatever you use to remove the clay wash, make sure it is only very slightly damp. I dab the brush or absorbent paper onto my tongue, but even then I dab it onto a dry piece of the paper. That's how 'damp' it needs to be. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, if you not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface. Then you can dry the surface and re-apply the clay wash and try again until you are satisfied. The technique is to brush over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry more or less straight away.

Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure.

Once finished, just run the brush under a tap to rinse out any residual clay pigments. If you've not used Flory Clay Washes before, the best thing to do is to experiment first on a test piece. You'll soon get the hang of it.

Once completed, the fuselage halves were given an airbrushed sealing coat of Alclad Light Sheen lacquer (ALC-311).

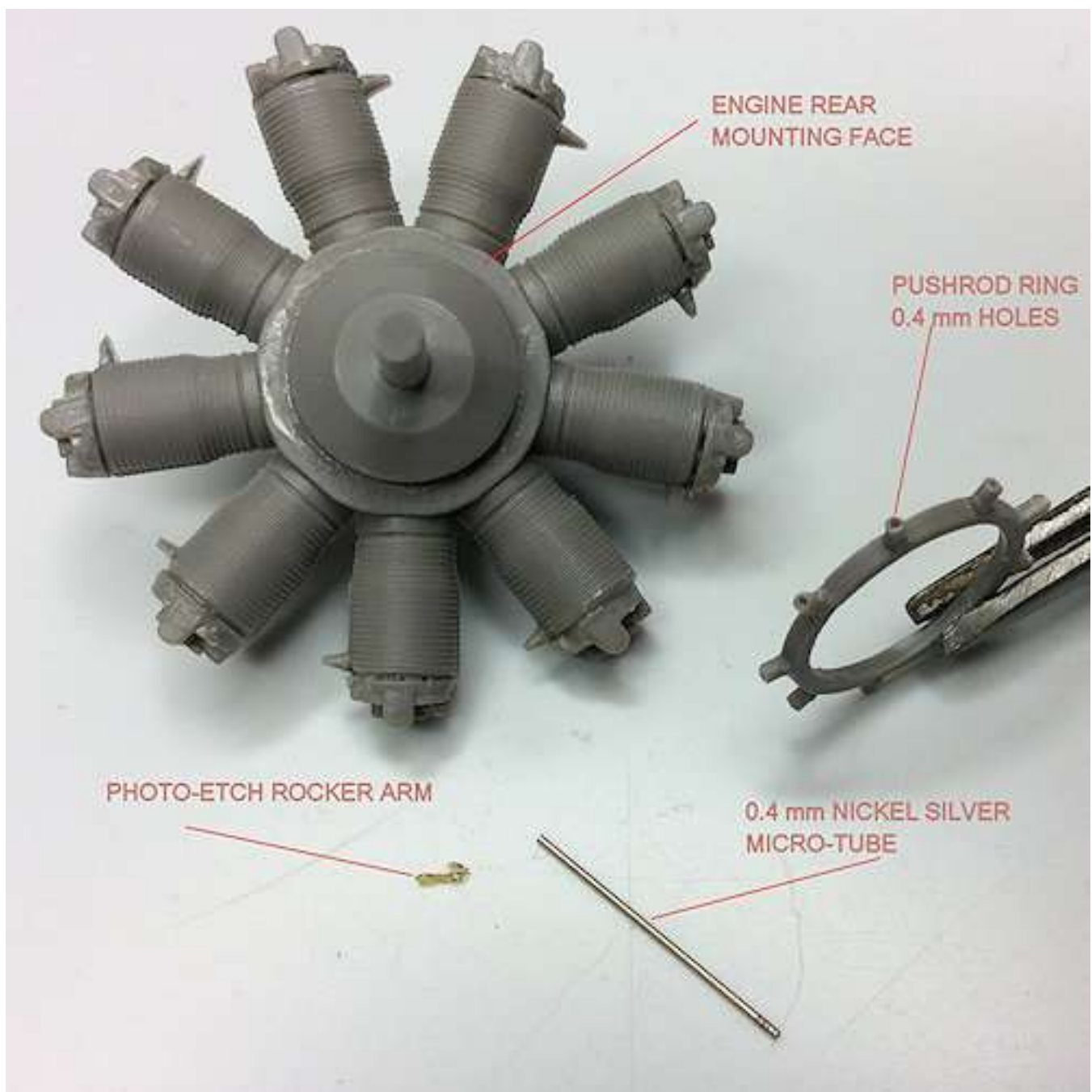
PART 4 - THE ENGINE

As the engine was a rotary, it was relatively straight forward to assemble by following the kit instructions. However, I decided to replace the kit supplied valve push rods as they look to bulky. I used micro-tube and parts from the photo-etch after market fret (JadarHobby Shop Part No.32028 Fokker DR.1 (1/32)). This photo-etch provides complete replacement parts for the engine valve mechanisms, but the kit detail is detailed enough to require use of just the push rod rocker arms (parts 42).

Modifications:

First I cut away the kit push rods from the ring, leaving just the push rod base 'nuts' in position. Then I drilled first a pilot hole of 0.3 mm diameter into the centre of each nut, following this up with a drill of 0.4 mm diameter.

The photo-etch parts 42 were cut away from the fret and the open hole end carefully bent around to form a 'U' shape to allow for the push rods to be inserted. These were secured onto the rear of the cylinder heads with CA adhesive.



Painting:

Once assembled I primed the engine, push rod ring and the fuel/air inlet manifolds with Alclad Grey Primer and Micro-filler (ALC-302).



Once dry I airbrushed the engine and push rod ring with Alclad II Gunmetal (ALC-120) and the inlet fuel/air manifolds with Alclad Exhaust Manifold (ALC-123). The engine was then airbrushed with a light coat of Alclad Aluminium (ALC-101), including the engine crank case. The spark plugs with Tamiya Dark Yellow (XF60). On the inlet fuel/air exhaust manifolds I applied Tamiya Weathering Set D (Burnt Blue), using a sponge and short, stiff brush, to give a heated effect. The engine crankcase was weathered, using Flory Dark Dirt clay wash and then the whole engine was then given a wash of AK Interactive 'Leaks and Stains'.

The next task is to add the ignition wires from the rear of the engine to each spark plug. To add the ignition leads I cut 9 lengths of 0.125 mm copper wire. Firstly I drilled 0.3 mm holes in the engine back plate. Each wire was then located in a hole and secured with CA adhesive. The other ends were then pulled around a spark plug and secured using thin CA glue. The excess was cut away using a shielded razor blade. As usual, once the engine is fixed to the forward fuselage bulkhead and the engine cowl is installed, very little of these ignition wires will be seen.

NOTE: The following step should be carried out after the engine has been assembled and painted.

Cut lengths of 0.4 mm Nickel Silver micro-tube (Albion Alloys), long enough to fit into the holes drilled in the ring nut and slot into the photo-etch rocker arms. These were then inserted into the ring nut holes and the other ends located into the rocker arms and secured with CA adhesive.

Once completed, the whole engine assembly was sealed by airbrushing Alclad Semi-Matte lacquer (ALC-312).



PART 5 - EXTERNAL SURFACES

NOTE: To avoid breeches of copyright or plagiarism, I have not included in this build log the details of model corrections carried out Claudio Kalisinski in his build log, a copy of which can be purchased from the 'Modeller Site' and which I've employed in this build. The following are my own corrections, found during build preparation.

Top wing window for ZAK data.

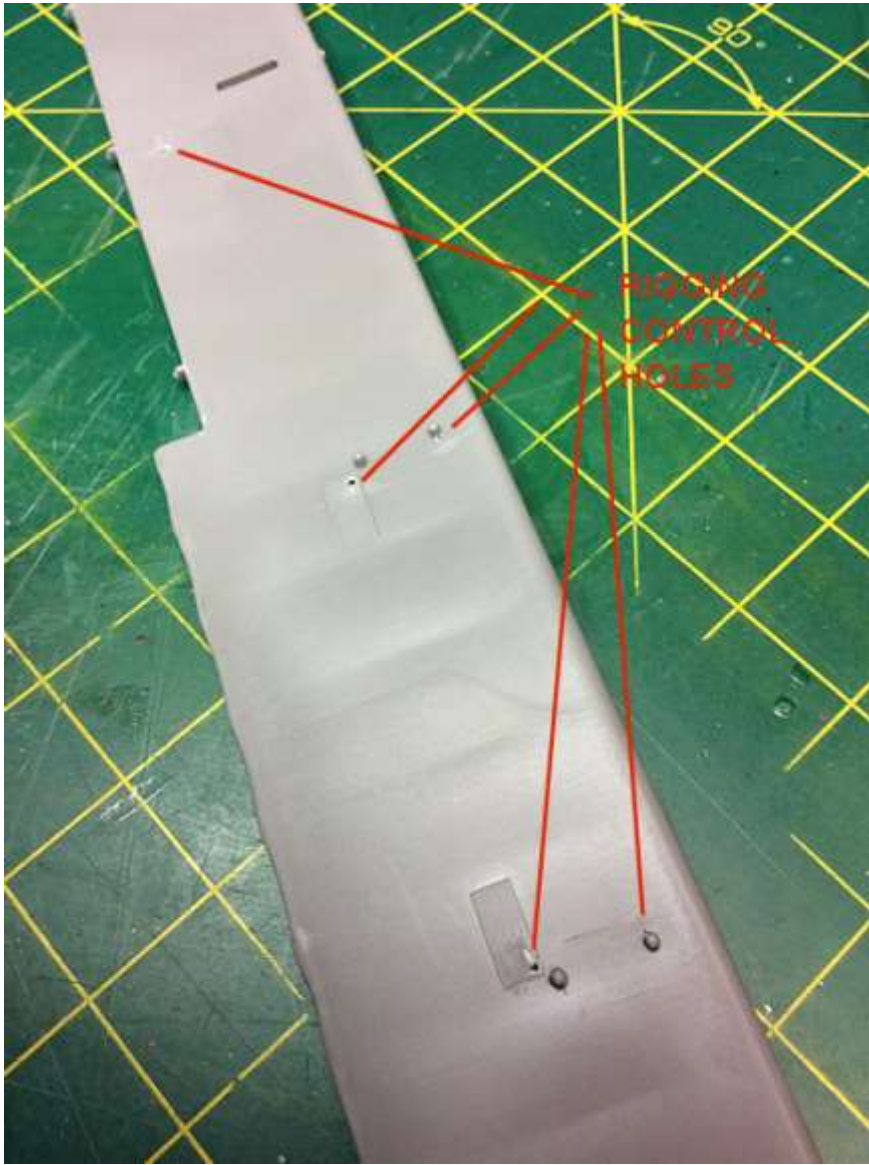
The model's top wing has a moulded 'panel', which reality was a clear 'Cellon' panel to allow visibility of the 'Zentral Abnahme Kommission' (ZAK) inspection mark and signature of the inspector. This was introduced following early structural failures and re-designing of the wing structures. The markings were made on the main spar. In addition the model's moulded 'panel' is too far towards the wing trailing edge. To correct this I first sanded away the molded panel and then scribed a new outline further towards the wing leading edge, over where the main spar would be. Using a sharp 2 mm chisel, I opened up the recess. This will be painted wood for the main spar with an acetate 'Cellon' cover, later in the build. I then created a 'ZAK' template and printed it. It will be added to the wing later in the build.



Moulded control openings.

The model top wing, fuselage and cockpit front decking has moulded openings for various rigging, control cables, but these openings are solid and needed to be drilled out to allow the control cables to pass through. This was achieved using a 0.6 mm diameter drill, positioning the drill to the correct angle for each cable run. Then the moulded surrounds were sanded off and will be replaced with those from the after market photo-etch sheet (JadarHobby Shop - Part No.48087 (1/48)).





Engine cowl.

The engine cowl has several areas that need to be addressed.

1. The thickness of the cowl was reduced by scrapping and sanding
2. The inner surface of the cowl was also reduced to give clearance for the engine cylinder tops and valve gear.
3. The front face of the cowl should have a circular rivet ring. This was corrected by fitting the photo-etch rivet ring from the photo-etch sheet (Jadar Hobby Shop - Part No.32028 Fokker DR.1 1/32).
4. Cowl retaining strap was added from the photo-etch sheet (Jadar Hobby Shop - Part No.32028 Fokker DR.1 1/32).



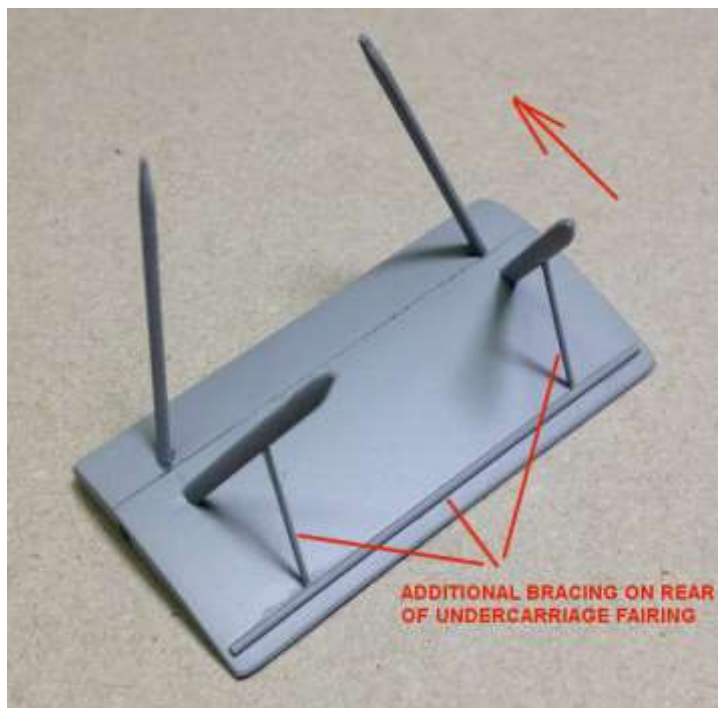
Packing studs on wing leading edges.

The actual aircraft had 'packing' studs fitted into the leading edges of all three wings. These were used to transport the wings with the leading edges at the bottom, the packing studs therefore protecting the wings leading edges. The positioning of these studs varied, depending on the time of wing build, but as a general rule I have positioned these as shown in the drawing. To do this I drilled holes of 1.0 mm diameter into the leading edges and inserted short lengths of 1.0 mm brass micro-tube (Albion Alloys), which was sealed inside with CA adhesive. Typical positions for the studs are shown below.



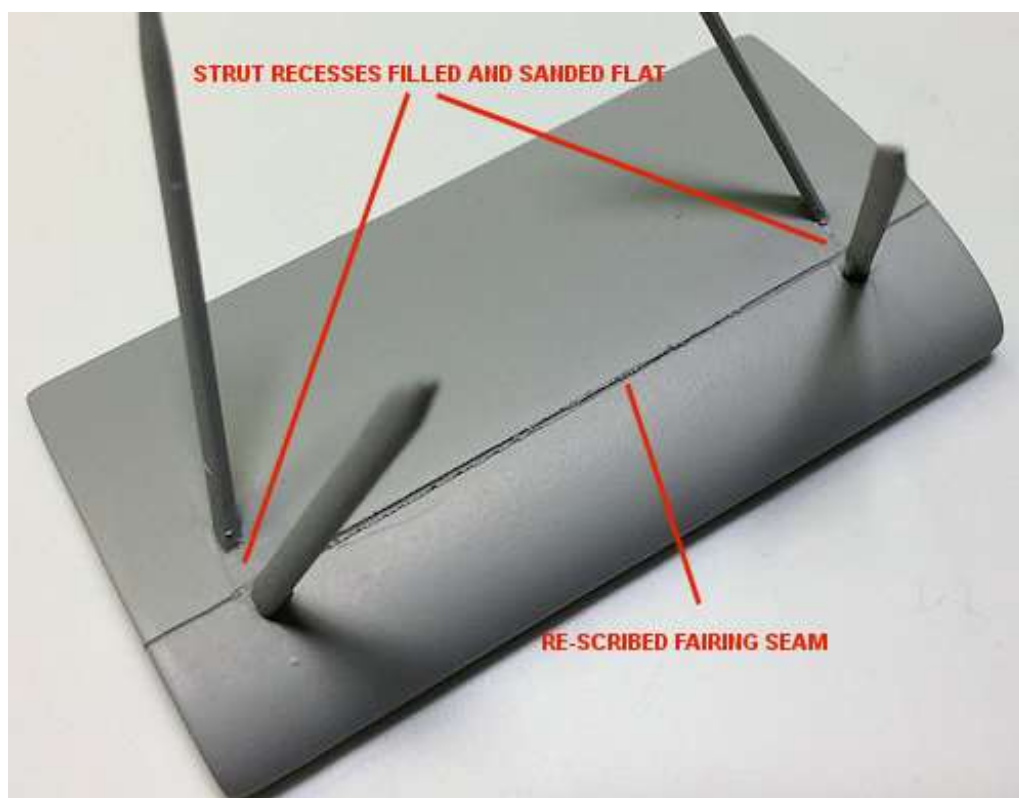
Undercarriage Strut bracing.

If you model an aircraft from Jasta 2 (Boelcke), you will need addition strut bracing, as was fitted to those units aircraft. These bracing struts were made from plastic rod and secured in position with Tamiya thin adhesive, then with a small amount of PVA adhesive.



Undercarriage Fairing.

Once assembled into the undercarriage fairing, the undercarriage struts need to be flush with the fairing surface. To achieve this I filled the openings with modelling putty and once dry, sanded it flush. I then re-scribed the fairing panel seam.



Wheels.

The wheels have solid mouldings for the access patches to the inner wheel spokes and valve. The patches were drilled and cut out, after which short lengths of 0.4 mm Nickel Silver micro-tube (Albion Alloys) were fixed on with CA adhesive (to represent exposed spokes). Similarly, a short length of tube was added to represent the tyre valve.



Flight Control Surfaces.

The kit supplied control horns for the elevator, both ailerons and the rudder, were replaced with the photo-etch horns from the Part No.32028 Fokker DR.1 (1/32) sheet and secured using CA adhesive.



The pre-moulded control outlet surrounds were sanded off and replaced with those from the PART No.48087 (1/48) photo-etch sheet. They were secured in position using CA adhesive.



Upper Surfaces - Fokker Streaked Camouflage:

Most WW1 data on aircraft colour schemes is at best conjecture and particularly concerning the what colours are and with regard to the later Fokker aircraft, the streaked camouflage applied. Again, some state it was an 'olive' coloured streaking, others it was more 'brown' in colour. The colour scheme I have applied to this model is the one I prefer, accurate or not.

NOTE: Decals for the streaked camouflage are now available from the 'Aviatic' web site.

NOTE 1: Remember to mask off those areas that required decals, before you apply the streaking paintwork.

NOTE 2: Applying sealing coats may darken the applied surface finish.

1. Primed the surfaces with Tamiya Fine Grey primer.
2. Airbrushed a base coat of Tamiya Deck Tan (XF55).
3. Airbrushed a thinned mixture of Tamiya Dark Green (XF70) and Cockpit Green (XF71), in broad streaks across the wing and elevator control surfaces. Airbrush from the leading edges to the trailing edges, spanning around two wing ribs and leaving less paint between these streaks.
4. Airbrush a thinned and sparse top coat of the same paint mix, but with more Cockpit Green added (XF71), to lighten the finish.
5. Airbrush a sealing coat of Alclad Semi-Matte lacquer (AL-312).
6. Using the Green and Mud colours in the Tamiya Weathering Set E and the Light Sand from set A, gently apply streak across the surfaces in the same direction as the previously applied paint. Apply small amounts and blend to the desired streaked effect.
7. To seal the surfaces, airbrush a sealing coat of Alclad Flat lacquer (AL-314). This will allow good adhesion for subsequent weather washes.

The following shot shows the surface finish after step 6 above. The subtle changes in the coloured streaks can be seen, in addition to the angle the streaks were airbrushed across the wings and top rear fuselage. Note: The streaking on the fuselage sides is vertical, not angled and the cockpit forward decking is olive plain green (not streaked).



The following shot shows the end result.



Next was to mask off:

1. The white back grounds for the national markings on the top and bottom wings and top of the ailerons as well as the fuselage sides.
2. The black/white flight colours on the tailplane and elevators. Also on the rear of the fuselage sides.
3. The black/white/red coloured bands on the fuselage.
4. The circular white face of the engine cowl.

The white areas were airbrushed with Tamiya White (XF2) with a couple of drops of Tamiya Buss (XF 57), which knocks back the brilliance of the white. The black used was Tamiya NATO Black (XF69) and the red was Tamiya Red (XF7). Once dry it was sealed with airbrushed Alclad Semi-Matte (ALC-312). NOTE: The 'ZAK' mark has been added to the cut out panel in the top wing.



External Underside Surfaces:

The underside surfaces of the wings, main wing struts, fuselage and undercarriage fairing were generally coloured light blue. For this I used Tamiya Light Blue (XF23). First I fixed the under fuselage photo-etch stitching from the Part No.32028 Fokker DR.1 (1/32) with thin CA adhesive. I then pre-shaded the wing ribs and fuselage cross members with thinned Tamiya NATO Black (XF69). Once dry, I airbrushed a light coat of Klear Kote Semi-Matte (ALC 312) lacquer, which seals in the painted surfaces, in preparation for the application of weathering. It also prevents the underlying paint from being rubbed through when wetting the clay wash during removal.



The ends of each wing strut were scrapped clear of paint to enable fixing into the lower wing, and top wing. Also the middle wing entries for each strut were tested to make sure the struts would fit correctly (passed through from the top of the middle wing).



The final fit of items in and around the cockpit was completed. The two machine guns were installed and their lead wire synchronisation cable gently pushed under the ammunition tank towards the engine. Also photo-etch ammunition belts from the Part No.32028 Fokker DR.1 (1/32) were painted and inserted into the ammunition box. A short length was added to curve up to the left machine gun feed chute. Both lead wire gun trigger cables were curved up and attached to the machine gun breech blocks. The padded head butt was also fixed to the back of the machine guns.

Finally, a windscreen (not supplied in the kit) was modified from my spares box. It will be fitted after the weathering is completed and given a final sealing coat of Alclad Light Sheen lacquer (ALC-311), otherwise it would end up looking opaque with lacquer sealer.

The weathering used is Flory Model clay washes, which come in various shades and consist of a very fine clay pigment. For more on applying Flory Clay washes, [refer to 'Fuselage Internals' earlier in this build log](#). There I describe applying these washes to the internal fuselage surfaces and the same technique was used for weathering the external surfaces.

The wash I used was the 'Dark Dirt' clay wash, with 'Grime' along the fuselage bottom edged and under the inboard surfaces of the lower wing.



Once the clay was wiped off to get the desired effect, I airbrushed Alclad Light Sheen (ALC-311) lacquer in order to seal in the clay wash. The same process was used on the upper surfaces and fuselage, including the wing support struts and flight control surfaces (Ailerons, Rudder and the Elevators).



Once the final assembly of the model was completed, I then moved onto the rigging. The only Visible rigging required for this aircraft is the cross rigging for the undercarriage forward struts and central forward top wing support struts. In addition, flying controls cables are required for both of the ailerons, rudder and elevators. Refer to the build log Part 11 for 'Rigging'.

The following shots are off the completed cockpit.

NOTE: The pairs of 0.12 mm monofilament, which are attached to the aileron control bell-crank (on the forward end of the control column torque tube), have been crossed and fed through their respective opening on the turtle deck, prior to attachment to the top wing when it is fitted.







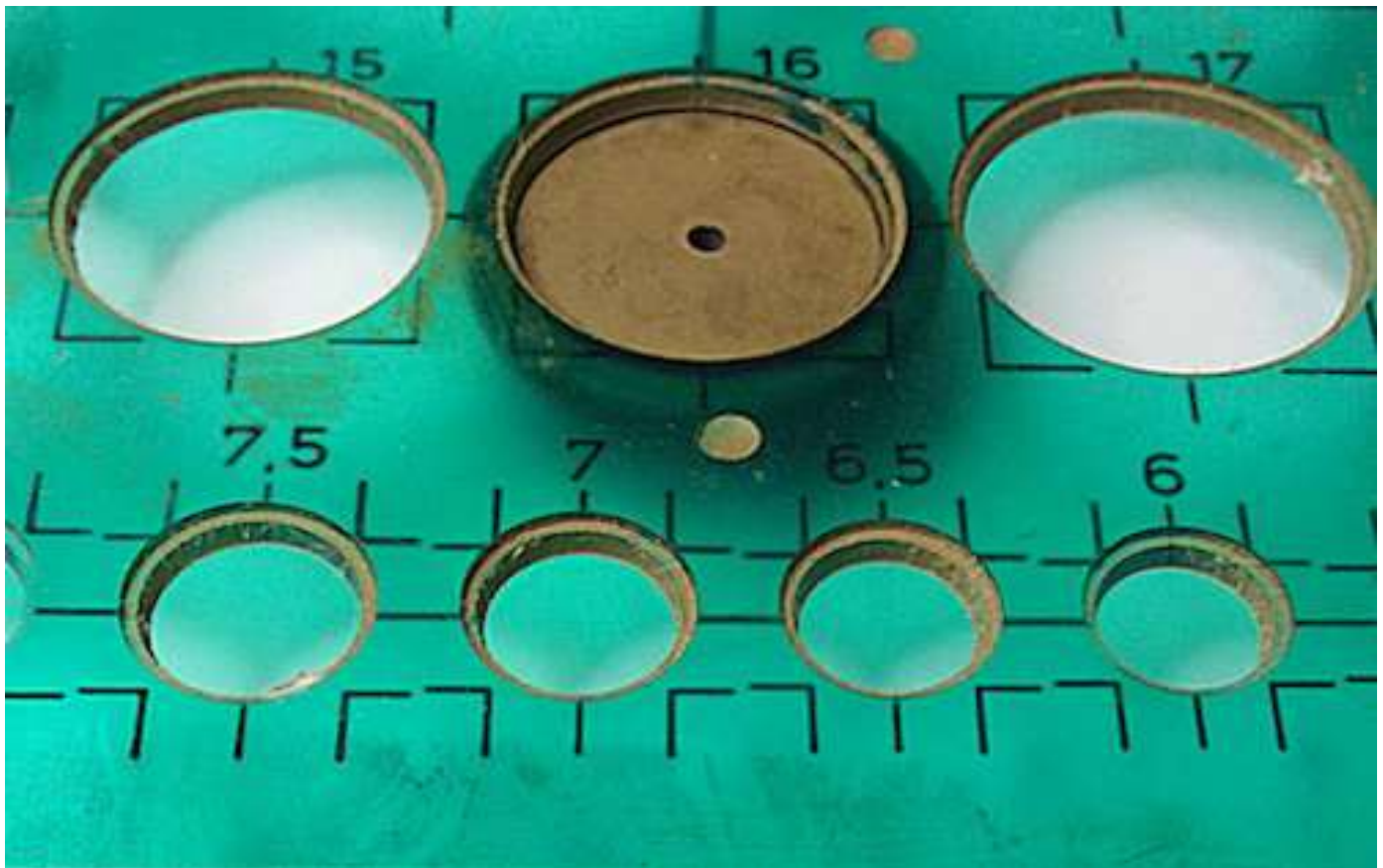
PART 6 - WHEELS

The assembly of the two wheels is straight forward. In the kit are two 'clip over' locking discs, which are used to secure the wheels onto the axle and allow them to rotate. I didn't use these as the intention is to have the model static on a display base. After priming, the insides of the wheels were airbrushed with Tamiya Deck Tan (XF 55). After assembly, the wheels were airbrushed with a mix of Tamiya Dark Green (XF70) and Cockpit Green (XF71). NOTE: To airbrush the face of the wheels without over spraying the surrounding tyres, I use a circle drawing tool (Linex 1217 T). I selected the correct size of hole, which in this case was 16 mm diameter, and positioned the wheel face under the hole. Then I airbrushed through the hole onto the wheel face.

This leaves the tyres in the grey primer colour, as tyres of that period were not black. Then I applied Flory Dark Dirt clay wash and when dry, wiped off to get the desired weathered look, making sure to remove most from the tyres. A light dusting of Flory Dark Earth pigments was applied around the rims. The wheels were then sealed with Alclad Light Sheen (ALC 311) lacquer. Once dry, I brushed a coat of AK Interactive 'Kerosene' around the tyres.

A 0.8 mm diameter hole was drilled through the tyre and towards the centre of the wheel. A short length of paper clip wire was then CA glued into the hole.

NOTE: Don't push the wires too far into the wheels, otherwise they may cross the centre of the wheels, stopping the axle penetrating fully into the wheels. These pins will secure the model onto it's display base.



PART 7 - WEAPONS

This aircraft was fitted with two Spandau LMG machine guns, which were belt fed from an ammunition box, located below the guns and in front of the pilot (the box forward of this one was used to store cartridges from the fired rounds). The guns supplied with the kit are solid and do not represent the open structure of the guns cooling jacket and barrel. Therefore I decided to replace the complete barrel assemblies with the photo-etch version from 'Master Models' (AM-32-023), which have the item machined from brass.

NOTE: Assembly is done using thin CA adhesive:

1. Cut away the barrel from the kit supplied item (leave a thin 'flange' of the barrel against the breech block).
2. Carefully sand away the remaining flange to the breech block, ensuring you get a square and flat surface (needed to correctly align the Master barrel assembly to the breech block).
3. Remove the photo-etch barrel end plates (2 front, 2 rear) and carefully cut away any tags on the edges (the edges are finally cleaned up later in the build).
4. Fix the gun muzzles into the gun barrels.
5. Gently insert a tooth pick into the barrel hole in the front end plate (not the 'solid plate').
6. **Note** - The front end of the cooling jacket has holes around the edge, not slots, which is the rear of the jacket).
7. Locate on the front end of the cooling jacket where there is a space with no holes - this is the bottom of the jacket where the barrel muzzle should be positioned.
8. Apply adhesive to the front end edge of the cooling jacket.
9. Carefully locate the end plate onto the cooling jacket, ensuring the edges are aligned, and hold until the adhesive has set, then gently twist the tooth pick and remove it.
10. Insert the gun barrel through the end plate hole and then locate the rear end plate over the protruding barrel.
11. Seat the end plate against the rear of the cooling jacket.
12. Ensure the barrel is aligned correctly inside the cooling jacket (it should be in the middle of the gap around the end of the cooling jacket, where there no slots). You can see the barrel alignment through the jacket slots.
13. Use the same technique as before to fix the rear end plate to the rear of the cooling jacket.
14. Clean the edges of the end plates by either gently sanding or using a diamond file specific for photo-etch work.



15. Drill a 1.0 mm diameter hole into the breech block, to locate the protruding brass gun barrel, ensuring that the gun barrel is at the bottom and the barrel muzzle is at the bottom, when viewed from the front. Also check that when located, the barrel assembly is correctly aligned with the breech block and not tipped in any direction.
16. Apply CA adhesive to the breech block and insert and align the brass barrel assembly. Hold in position until the adhesive has set.



Below is a gun assembly with the ammunition feed and ejector chutes fitted, ready for priming and painting.

Each weapon was then primed then airbrushed with Alclad Gun Metal lacquer (ALC-120). Once dry I dry brushed Mr. Metal Stainless Steel (213). To paint the 7.92 mm ammunition rounds, I used Mr. Metal Brass (219) with Tamiya Light Grey (XF56) for the ammunition belts, followed by a light wash of AK Interactive Stains and Leaks.



A padded head protector was fitted to span across both machine guns. As this is located on the rear of the gun breech blocks, it was fitted later in the build, once the middle wing was fixed in position, closing the cockpit. The protector was painted with a mixture of Humbrol Leather (62) and Tamiya Flat Brown (XF 10).

To represent the gun synchronisation cable from each machine gun to the engine, I painted a short length of 0.5 mm lead wire black, then drilled a 0.7 mm hole in the underside of the gun breech block. The end of the wire was then inserted into the hole and fixed in position with thin CA adhesive. The other end of the wire will be bent under the ammunition tank to face the engine.



PART 8 - DECALS

The decals supplied for this particular kit proved problematic, for the following reasons:

1. Some were cracked and broke up when being applied.
2. The registration (alignment) of colours of the fuselage datum line decals was blurred at the edges.
1. The carrier film on all of the decals was thick, causing this to show once the decals were applied.
1. If you do one of the colour schemes using the Balkan Cross marking, you need 2 for the top wing, 2 for the bottom wing, 2 for the fuselage sides and 2 for the rudder sides. The kit only supplies 6, 4 of which are the smaller version, meaning the kit is short of 2 of these decals.
2. The top wing Balkan Cross decals had to be cut into separate decals, which then had to be aligned between the wing and its associated aileron.
3. The wing Balkan Cross decals will require a white background to be painted before the decals are applied.

First the areas to have decals was airbrushed with Alclad Gloss lacquer, to form a smooth surface and reduce the likelihood of 'silvering' under the applied decals. This is caused by air being trapped in the rough surface of the paint, which after the decal is applied and dries, causes the 'silvering'. Once dry, the decals were loosened in water and slid into position. Soft tissue paper, such as toilet paper, was used to squeeze out surplus water. Then I applied a coating of 'Micro Sol' setting solution all over the decal, including the parts of the decal standing away from the surface they needed to be tucked around. The setting solution softens the decal and allows it to seat down fully on the surface. After a minute or so the decal can be gently pushed around the edges.

NOTE:

1. As the setting solution softens the decal, care must be taken when touching the decal or damage can be caused.
2. The setting solution causes the surface of the decal to wrinkle, but this is normal and the decal, when dry, will be flat. If there are any visible bubbles under a decal, use a sharp pin to prick the bubble then apply more setting solution.

Then a coat of Alclad Klear Kote Semi-Matte (ALC 312) lacquer was airbrushed over them to merge them with the previously applied lacquer and also to seal them. Once dry, Flory 'Dark Dirt' clay wash was applied (see External Surfaces) over all decal areas and when dry, gently wiped off to create a subtle weathered effect. And a final coat of lacquer was applied to seal the decals. A final coat of Alclad Semi-Matte lacquer was then applied to seal the clay washes.

PART 9 - PROPELLER

The kit supplied propeller can be primed and either hand or airbrushed, to achieve the laminated wood effect, is desired. To do this effectively can be difficult and a bad propeller can ruin the look of an otherwise good model.

For this build I first primed the propeller, then hand painted the wood laminations using Tamiya Deck Tan (XF78) and Tamiya Flat Brown (XF10). Once dry I applied the Axial decals then sealed the propeller with Alclad Light Sheen (ALC-311).

I then added a few drops of Tamiya Smoke (XF19) to some Alclad Light Sheen (ALC-311) and airbrushed a sealing coat over the propeller, to knock back and blend the colours. This created a darker wood effect, but still allows the different colours of the laminations to just be seen.

PART 10 - FIGURE

The figure I chose to use is the German Fighter Pilot (No.2) from Black Dog Models (F32002). This is a simple enough resin figure to assemble and only needed a few small seams and flash to be removed. I then washed the figure in warm soapy water using an old toothbrush. This was to get rid of any residual release agent from the figure. Ensure the figure is fully dry before continuing. The pilots head was replaced with a head from the Aviattic (Attres029 WW1 1/32 German Pilot Head Set (x5).

NOTE: When brush painting with Acrylics, I always add a small amount of thinner in order to keep the paint fluid, otherwise I find it doesn't brush well onto the primed surface.

Once fully dry the figure was primed using Tamiya Fine Grey primer. The paint used were:

1. Boots - Tamiya Rubber Black (XF85).
2. Trousers - Mix of Tamiya Light Grey (XF66), Medium Blue (XF18) and Flat Blue (XF8).
3. Jumper - Tamiya Deck Tan (XF55) and Flat White (XF2).
4. Goggles - Humbrol Leather (No.62).
5. Flesh - Model Colour Beige Red (70.804), Light Flesh (70.928) and Violet Red (70.812).
6. Hair - Tamiya Flat Earth (XF52).

The shadows and highlights were brushed on while the base coat was still wet, which allows you to blend the paint, rather than ending up with stark contrasts.



PART 11 - RIGGING

The first thing to check is that you have already drilled out the rigging attachment points. This aircraft had minimal external rigging by comparison to its contemporaries. These were:

1. Upper and lower aileron cables.
2. Fuselage to top wing—twin aileron cables.
3. Cross-bracing at forward cabane struts.
4. Cross-bracing at forward undercarriage support struts.
5. Upper and lower elevator cables (pair each side).
6. Rudder control cables (one each side).

The relevant holes were drilled 0.5 mm diameter and those in the control horns for the ailerons, rudder and elevator were of 0.3 mm diameter. It is always best to carry out research in reference books or on-line before drilling. Some modellers use micro drills manufactured for drilling printed circuit boards etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have found that these drills are too sharp and instead of easing their way into the plastic of the model, they tend to bite in and effectively 'cork screw' their way in, which causes jamming and lots of broken drills. This is not only expensive but can leave broken drill bits in the model, which are virtually impossible to extract. I prefer to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use. Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/thread, gluing in position and then rubbing down the exposed rigging 'tag' and re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.

With your research complete and all necessary holes pre-drilled, the rigging can start.

For structural strength I used 'Steelon' mono-filament (fishing line) of 0.12 mm diameter. This is effectively transparent but does give a look of steel, without the need of painting or colouring with a gel pen. Typically for many German aircraft, the Fokker Triplane has only cables for rigging and controls.

To represent the tie-backs of the cables, I used 0.4 mm Nickel silver tube (Albion Alloys). This was cut to appropriate lengths by rolling a shielded razor blade across the tube whilst applying light pressure. This will easily cut the tube without leaving burrs or blocking the cut end of the tube, which stop the rigging from passing through.

A long length of line was inserted through the tube and then through either the Gaspatch 'anchors' or turnbuckles and then back through the tube, then secured with CA adhesive at the tube. Any ends of line can be cut close to the control horn etc with a razor blade.

The completed assemblies were 'toned down' by applying a light coat of AK Interactive wash, then sealed with a light airbrushing of Alclad Light Sheen (ALC-311) lacquer, which also gives the a shine to the mono-filament and gives it a look of steel.

As you work your way through the rigging it is always good to check the rigging attachment points for any damaged paint. This can be rectified before continuing with the rigging, just in case access will be limited once all of the rigging is completed.

PART 12 - DISPLAY BASE

The display case is made from 6mm thick Piano Black Acrylic sheet and the transparent top is fabricated from 3mm thick Clear Acrylic sheet. This was made for me by an on-line manufacturer. The name plaque was also made by an on-line retailer and was attached to its mount.

The model and pilot figure were positioned on the base in their final positions and the pin locations were marked on the base. Three 1.0 mm holes were drilled into the base to correspond to the paper clip pins in the two wheels and the one in the leg of the pilot figure. Three lengths of paper clip were cut and temporarily located into the three holes.

The grass mat was cut to shape from a sheet of 'Model Scene Grass Mats'. The cut mat was then positioned on the base and with the three pins protruding through the mat. The outline of the grass mat was then lightly scored into the base surface. The grass mat was then removed and the black base was scuffed inside the mat outline with a medium grade glass paper in order to give a key for adhesive. The back of the grass mat was then lightly sprayed with water.

NOTE: If too much water is sprayed onto the grass mat and/or too much adhesive is applied to the base, the result will be that adhesive will show through the grass mat and possibly still be visible once the adhesive has fully dried.

A coat of PVA adhesive (wood glue) was applied to the base over the scuffed area and slightly outside the outline of the grass mat (for applying a sand border). The grass mat was then laid onto the PVA adhesive and positioned correctly, again with the temporary pins protruding through. Light pressure was applied to ensure the mat was in contact with the adhesive. While the PVA adhesive was still wet, dry sharp sand was sprinkled around the edges of the grass mat and lightly pressed into the PVA adhesive.

Once the PVA adhesive was dry, the excess sharp sand was 'knocked' off the base. Don't brush off the excess sharp sand or you may scratch the exposed base surface, which is acrylic sheet and easily marked.

Kitchen 'Cling-Film' was positioned around the grass mat (slightly away to leave the applied sharp sand exposed) and held in position with thin modelling masking tape, following the outline shape of the grass mat (maintain the curved edges of the outline by avoiding straight or sharp edges of the tape). This sand border was then airbrushed with Tamiya Flat Brown (XF10) and once dry was lightly dry-brushed by hand with Tamiya Dark Yellow (XF60) to add colour variation. This border effect can also be achieved by hand brushing, in which case the Cling Film and masking tape would probably not be needed.

To add variation to the grass mat, small clumps of 'Mini-Nature' two colour grass tufts (737-22S) can be secured in place with PVA adhesive. Although slightly two tone in colour, these grass tufts can be lightly dry-brushed with Tamiya Dark Yellow (XF60) to enhance the effect of dry grass.

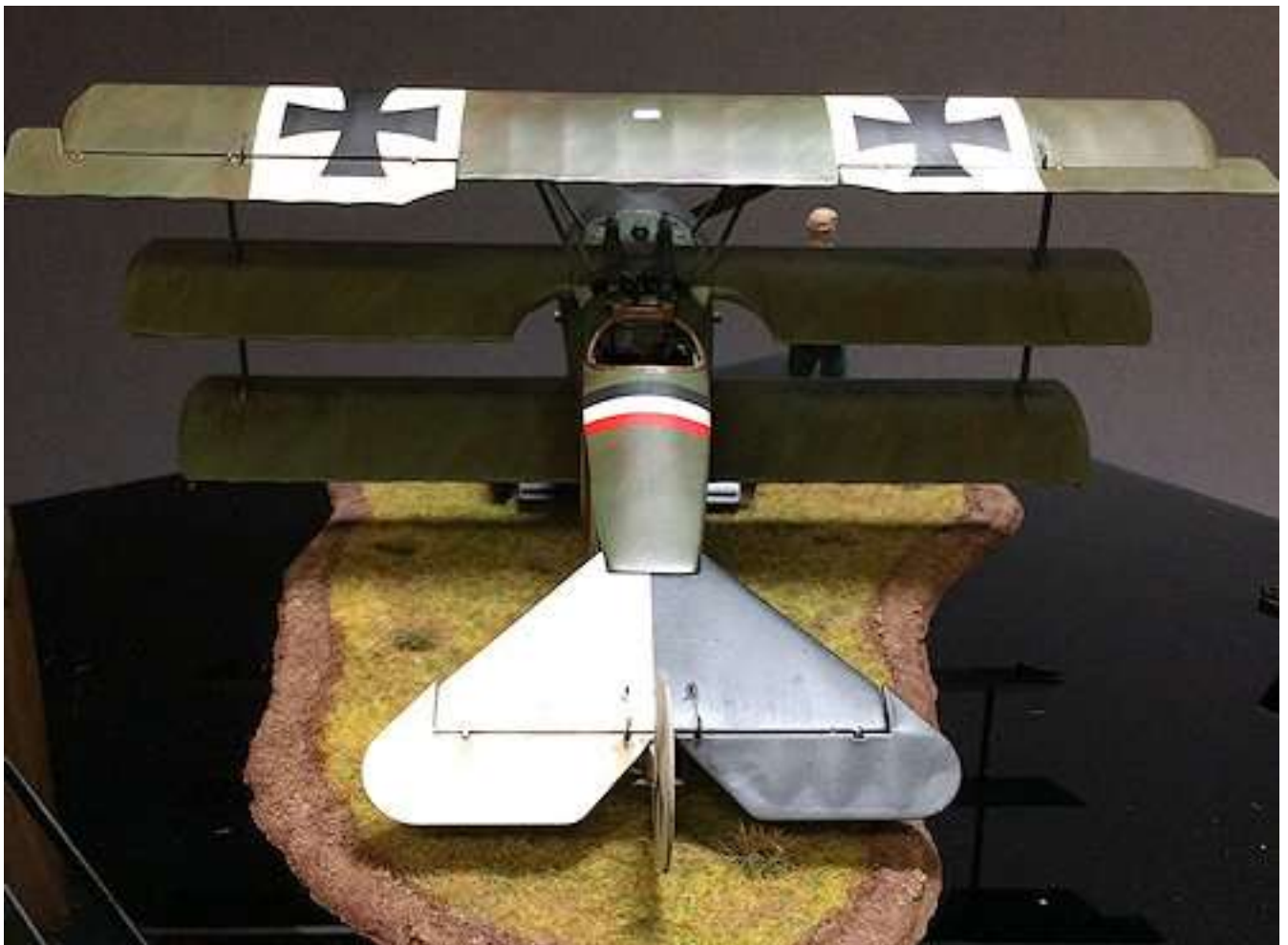
The three temporary paper clip pins were then removed and the three holes 'cleared out' with a 1.0 mm drill to ensure the model pins would fully seat into the holes.

CA adhesive was then applied to the two wheel pins and the model was carefully seated into the two previously drilled holes. Light pressure was applied to the wheels and rear fuselage to ensure the model 'sat' naturally on the grass mat. The same was applied to the pilot figure.



COMPLETED MODEL PHOTOGRAPHS



















END