



# 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. As most modelers, I got involved in the world of construction kits at an early age, but 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, various modelers have asked if I would create 'build logs' for my future builds, which is what I now do for each build.

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 the 'Wingnut Wings' 1:32 scale model of the Halberstadt CL.II.

*Mike 'Sandbagger' Norris*

[sandbaggeruk@sky.com](mailto:sandbaggeruk@sky.com)

<https://mikesww1aircraftmodels.com>

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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.



# AFTER MARKET

## **AFTER MARKET**

### **Figure**

'Model Cellar' WW1 German two seater crew (MC32016).

### **Propeller**

'ProperPlane' wood laminated 'Garuda' propeller.

### **Weapons**

'Master' 1:32nd Spandau LMG 08 Brass barrels (AM-32-023),  
'Master' 1:32nd Parabellum LMG 14 Brass barrels (AM-32-024).

### **Rigging accessories (as required)**

'Steelon' or 'Stroft GTM' 0.08 and 0.12mm diameter mono-filament,  
'Gaspach' 1/32nd scale metal turnbuckles (One Ended) and Anchor Points,  
'Proper Plane' 1/32nd scale 3D printed resin turnbuckles (RD-005),  
'Gaspach' 1/48th scale metal turnbuckles (Type C),  
'Albion Alloy's' 0.4mm and 0.5mm Brass tube and rod.

### **3D printed resin**

'Proper Plane' Continental 760x100 tyres and inner wheel covers set (RW-002).

### **Decals**

'Aviatic' Halberstadt Cl.II 5 colour lozenge upper surfaces (ATT32196),  
'Aviatic' Halberstadt Cl.II 5 colour lozenge lower surfaces (ATT32199),  
'Aviatic' Halberstadt Cl.II 5 colour lozenge tail surfaces (ATT32205),  
'Aviatic' Halberstadt Cl.II 5 colour fuselage stipple surfaces (ATT32209).

### **Sundries (as required)**

Paints ('Tamiya' Acrylic, Humbrol Acrylic, 'Mr. Metal Colour', 'AK Interactive' Primer and micro-filler (Grey AK758, White AK759), 'AK Interactive' figure paints, Kerosene AK-2039, Oil AK-2019 AK-2033, 'Alclad II' Lacquers, 'Alclad' Aqua Gloss 600, 'Mr. Colour' Levelling Thinners, 'Vallejo' Model Colour, PVA Adhesive (e.g. 'MicroScale' Kristal Klear), 'VMS Fleky' CA adhesive (Standard and Thin), Metal Prep 4K or 'Mr. Colour' Metal Primer R, UHU White Tack, 'AV' Masilla Plastica (401) putty, 'Mr. Hobby' dissolved putty, 'White Spirits', 'De-Lux Materials' Perfect Plastic Putty, 'Flory Models' sanding/polishing sticks, 'Humbrol' Maskol, 'Milliput' two part putty, 'Mr. Surfacer 500, 1000,1200', 'DecoArt Crafters Acrylic' (water based) paints, 'Artool' Ultra Mask sheets, 'Plastruct' styrene rod, 'Tamiya' liquid cement, 'PlusModel' lead wire, 'ANYZ' 0.5mm silver/black braided line, 'Plastic Magic' liquid cement, 'Blacken-It' solution, 'MFH' black 0.4mm flexible tube (P-961), 'EZ' stretch line (fine or heavy black), 'Revell' Contacta Professional cement (39604), 'Citadel' paints range, 'MFH' Black tube (P-961), 'PlusModels' lead wire, 'Artool' mask sheet, 'MDP white and clear backed decal paper for inkjet printer, 'Krylon' Acryli-Quik sealer, 'Abteilung 502 (ABT115) masking fluid or 'Molotow' pump masker, 'Tamiya' acrylic paint retarder, 'Windsor & Newton' Griffin Alkyd paints, 'AK Interactive' oil brushers, 'AK Interactive' Odourless Thinners (A.Mig 2019), 'Blacken-It' solution.

### **Weathering mediums (as required)**

'Flory' Clay washes and Pigments, 'AK Interactive' washes and Weathering Pencils, 'Tamiya' Weathering Master (Set C, D and E).

### **Display Base**

Etched Plaque (name plate), 'Inperspective' custom made Acrylic base and cover, 'Lars op't Hof' Scenery (Pasture Summer Long).

# THE AIRCRAFT AND CREW

## THE AIRCRAFT AND CREW

This model represents Halberstadt Cl.II 'Anni' of Schlachtstaffel 'Schlasta' 27b (Battle Squadron), based at Villers-au-Tertre Aerodrome from late 1917. The pilot was Uffz. Fridoin Redenbach and the observer/gunner Oblt. R. Sigmund Kreitmair (Commanding Officer of the unit).

### References:

'Wingnut Wings' instruction manual.

'Windsock' date file No.27 - Halberstadt CL.II (P.M. Grosz).

Colour profiles by 'R.N. Pearson' with data from 'Dan-san-Abbot'.

On-line resources (various).

### General:

**NOTE:** *The following 'General' text is taken from the 'Wingnut Wings' instruction manual.*

The Halberstadt Cl.II was a highly successful escort fighter and infantry support aircraft. Halberstadter Flugzeugwerke GmbH was initially established in 1912 as Deutsche Bristol Werke GmbH and built Bristol aircraft under license. After war broke out in August 1914 they changed their name to Halberstadter Flugzeugwerke GmbH and continued to build aircraft more suited to training until late 1915 when they introduced their successful Halberstadt D.1 single seat fighter. In November 1916 Halberstadt started work on 3 prototypes built to Idflieg's new lightweight C class (armed two-seat) specifications incorporating many features from their single seat fighters. The result was the sleek 160hp Daimler-Mercedes D.III powered Halberstadt Cl.II, the lower case "I" indicating leicht (light) weight, and the first prototype 9902/16 was completed in April 1917.

After initial evaluation the single piece top wing was split into 3 parts, the fully enclosed engine cowling was reduced and the elevator balances were removed. Following successful type-testing in May 1917, an order was placed for 100 Halberstadt Cl.II and production aircraft began arriving at front line units from late July 1917 onwards. It was very well regarded for its good visibility, climb rate, maneuverability, stability and ease of internal communication afforded by the close nature of the pilot and gunner.

Halberstadt Cl.II were initially tasked with escorting traditional two-seat C type reconnaissance and artillery spotting aircraft, often assigned to a specialised Schutzstaffel (Protection Squadron), which were renamed Schlachtstaffel (Battle Squadron) following their transition to infantry support in March 1918.

### Construction:

The Halberstadt Cl.II featured a plywood skinned top wing centre section and fuselage with conventional linen covered tailplane and wings, although the wing fabric was applied at a 45 degree angle to the line of flight. Early production Halberstadt Cl.II had a forward firing LMG 08/15 'Spandau' mounted to the port side of the engine, aerodynamic control rods for the ailerons and an undersize rudder, which was enlarged shortly after production began and retrofitted to earlier aircraft. On late production Cl.II the LMG 08/15 'Spandau' was mounted above the starboard side of the engine and the aileron control rods were simplified. Some very late production aircraft were fitted with a redesigned gun ring with "X" style bracing which was also seen on the Halberstadt Cl.IV. It appears to have been the intention to arm late production aircraft with a 2nd forward firing 'Spandau' mounted high on the port side but only a very small number were finished this way. Early and late production aircraft could be found powered by 160hp, 180hp and 200hp Daimler-Mercedes D.III, D.IIIa and D.IIIaü engines. The bottom of the fuselage under the cockpits was constructed from metal to provide some protection from ground fire. Depending on operational requirements the Halberstadt Cl.II could carry various models of camera and wireless equipment as well as small bombs.



About 900 Halberstadt Cl.II were produced, 200 of which were built by Bayerische Flugzeug Werke (BFW) under license in 1918, half of which were powered by the 180hp Argus As.IIIa engine and designated the Cl.IIa. Although superseded by the even lighter Halberstadt Cl.IV introduced in the middle of 1918, the Cl.II soldiered on to the Armistice and saw post war service with Poland.

**General specifications:**

Wingspan - 18' 6" (10.77m)

Length - 24' (7.3m)

Maximum weight - 2,500lb (1,133kg)

Maximum speed - 102mph (165kph)

Ceiling - 16,400' (5,000m)

Engine - Daimler-Mercedes D.III, D.IIIa or D.IIIaü (160, 180 or 200hp)

Weapon (pilot) - one 7.92mm LMG 08/15 'Spandau'

Weapon (observer) - one 7.92mm LMG or 'Parabellum' LMG 14/17

Bomb load - 50kg of bombs.

**Schutzstaffel 'Schusta' 27b :**

During 1916 the Luftstreitkräfte was re-organized and as a result, the 'Schusta' (Protection Squadron) 27b was formed from Kasta 36 on January 1st, 1917 at Mont airfield in the 5th Army sector near Verdun. It then began escort duties for FA(A) 252w at Higny-Preutin and later at Puxieux airfields along the 5th Army sector.

On April 6th the unit was moved to the 6th Army sector to escort FA(A) 224w aircraft, operating out of Bellincamps airfield. Here they remained until June 10th before being transferred to the 4th Army to escort several different squadrons.

Schusta 27b continued in this role, but when the Battle of Cambrai started in late November 1917, the unit were transferred on November the 23rd to Bertry in the 2nd Army sector.

On December 8th the unit moved to Villers-au-Terte in the 6th Army sector and remained there despite the airfield coming under 17th Army control on the first of February 1918.

With the 17th Army, Schusta 27b saw the start of the Spring Offensive in March 1918 and the change of its designation on March 27th 1918 to Schlachtstaffel 'Schlasta' 27b (Battle Squadron). It was then engaged in ground attack missions.

The unit served out the remainder of the war with 17th Army except for a short four day stint with 2nd Army starting on August 8th.

Schusta 27b would claim three confirmed and one unconfirmed aircraft destroyed for a loss of six killed and three wounded (one in error by a Fokker DVII) with several more injured or killed in accidents. The unit operated a myriad of aircraft during its service including the: Roland CII, Albatros CV, Albatros CVI, Albatros CVII, D.F.W. CV, A.E.G. CIV, L.V.G. CIV, L.V.G. CV, Rumpler CV, Hannover CLII, and Halberstadt CLII. It commenced operations with the Albatros C types and Roland CII.

The unit markings originally were a black chevron pointing towards the front of the aircraft on its fuselage sides along with a numeral either in front or aft of this chevron (though typically aft). In late 1917 the chevron was changed to white, roughly during the time of transition to the CL type aircraft.

**Fridoin Redenbach:**

Uffz. (Unteroffizier - non-commissioned officer) Fridoin Redenbach served in Schusta 27b from July 1917. He was slightly wounded in action during August 1917. He transferred to FEA 2b in the March of 1918.

### Sigmund Kreitmair:

On the 22nd of February 1917, Oblt. Sigmund Kreitmair was appointed as the Commanding Officer of Schusta 27b. During August 1918 he was promoted as the Commander of the entire Bavarian Schlasta Group B.

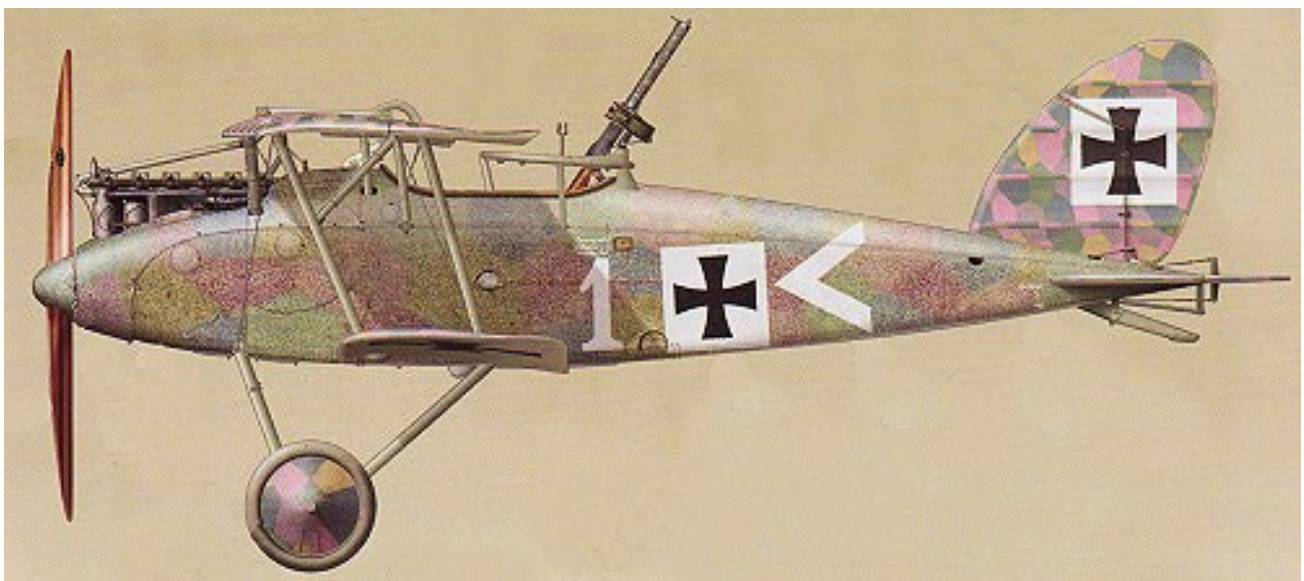
### Specific aircraft:

**NOTE:** *The colour profiles shown were created in 2012 by R.N.Pearson and were based on data from Duiven/Dan-San-Abbot and the 'Schlachtflieger' publication.*

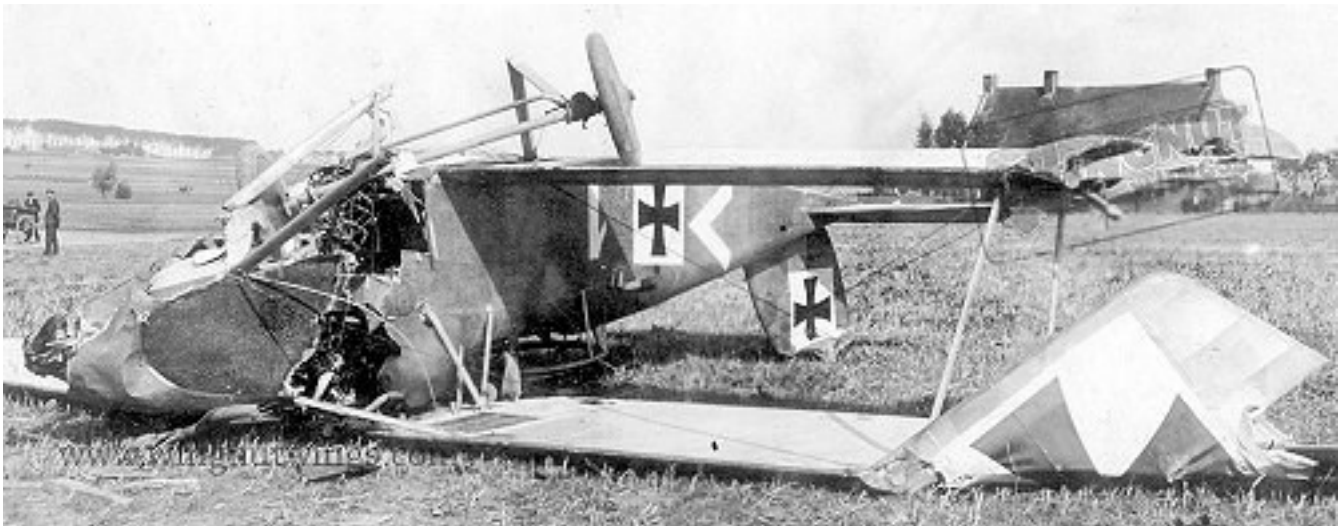
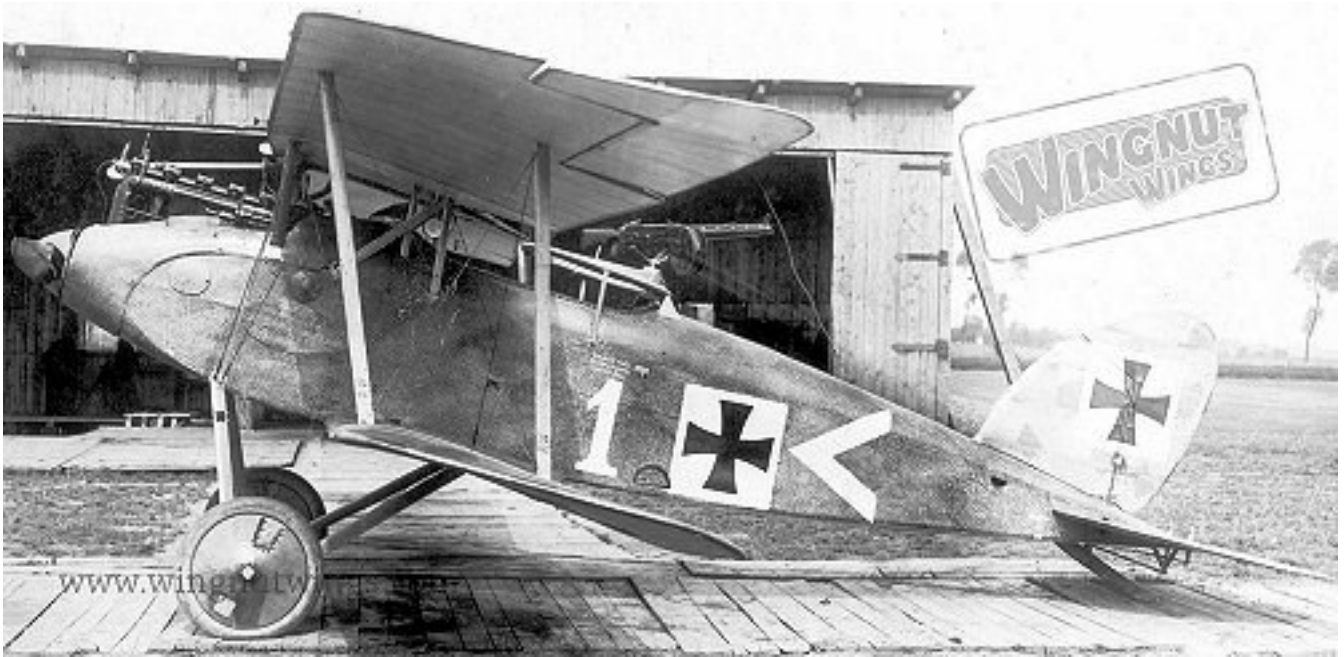
The serial number of this particular aircraft is not known, but it seems it was an early version Halberstadt Cl.II operated by Schutzstaffel 'Schusta' 27b (Protection Squadron) during September 1917. The aircraft was flown by Uffz. Fridolin Redenbach. At this time the aircraft camouflage consisted of the lighter coloured five colour lozenge linen, applied to the upper surfaces of the wings and ailerons, tailplanes, elevators, fin and the rudder. This lozenge was also applied to the wheel coverings. The undersides of the tailplanes, wings, ailerons and elevators was Clear Doped Linen (CDL). The 1917 pattern of 'Cross Pattee' on white backgrounds were applied at an angle on the sides of the fuselage with the squadron markings in white.



The 'Wingnut Wings' model kit used for this build also has a colour profile, by Ronny Bar, of this aircraft.



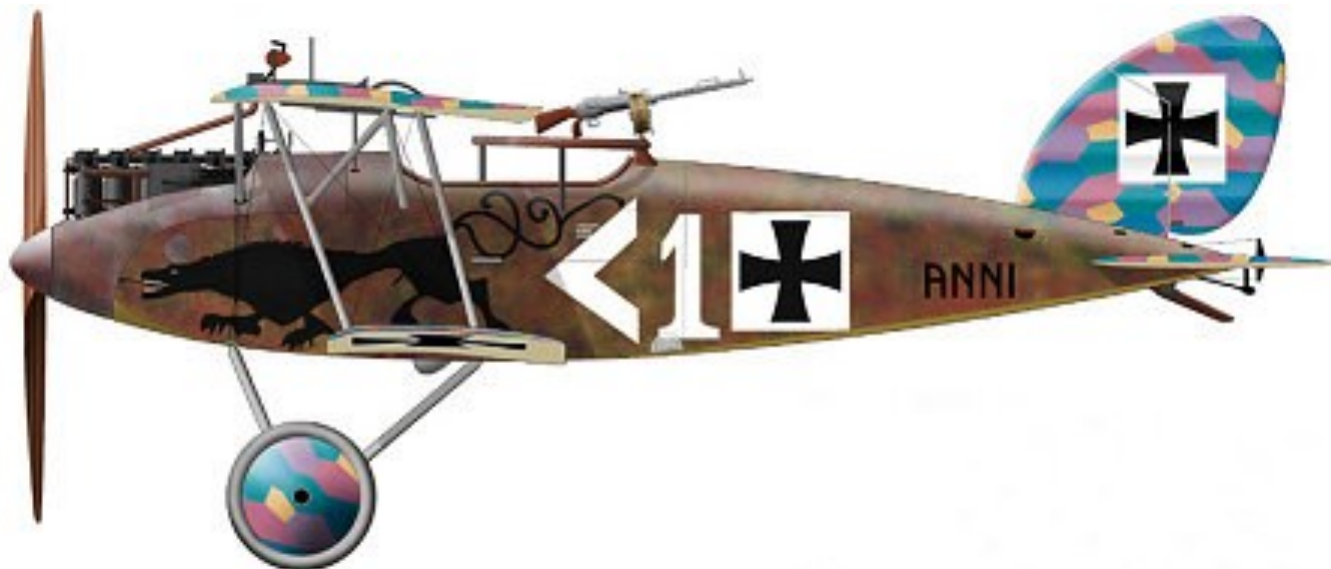
The 'Wingnut Wings' photograph archives has two pictures of what appears to be this aircraft before and after it crashed and was presumably written off as non-repairable.



A second colour profile was created for this aircraft covering the period of October-November 1917, when the aircraft was being flown from the Oosterkamp Aerodrome by Uffz. Fridolin Redenbach and Oblt. Sigmund Kreitmair (CO of Schusta 27b). This profile was based on information in the 'Schlachtflieger' publication and from the 'Mirage' 1/48th scale model kit for this aircraft.

It's probable that this was a replacement aircraft given the markings of the crashed and written off aircraft previously shown.

At this time the aircraft differed only in that the size of the squadron markings was larger and the fuselage 'Cross Patteé' was levelled. The more obvious differences were that a large black 'devil cat' was painted on forward sides of the fuselage and the name 'ANNI' painted in black on the lower, rear of the fuselage.



The 'Wingnut Wings' photograph archives has a picture of the remains of Schusta 27b Halberstadt Cl.II Serial No: 5716/17 'ANNI', which presumably could have been the previous aircraft after it also crashed and was presumably written off as non-repairable. Hence the third colour profile of this aircraft.



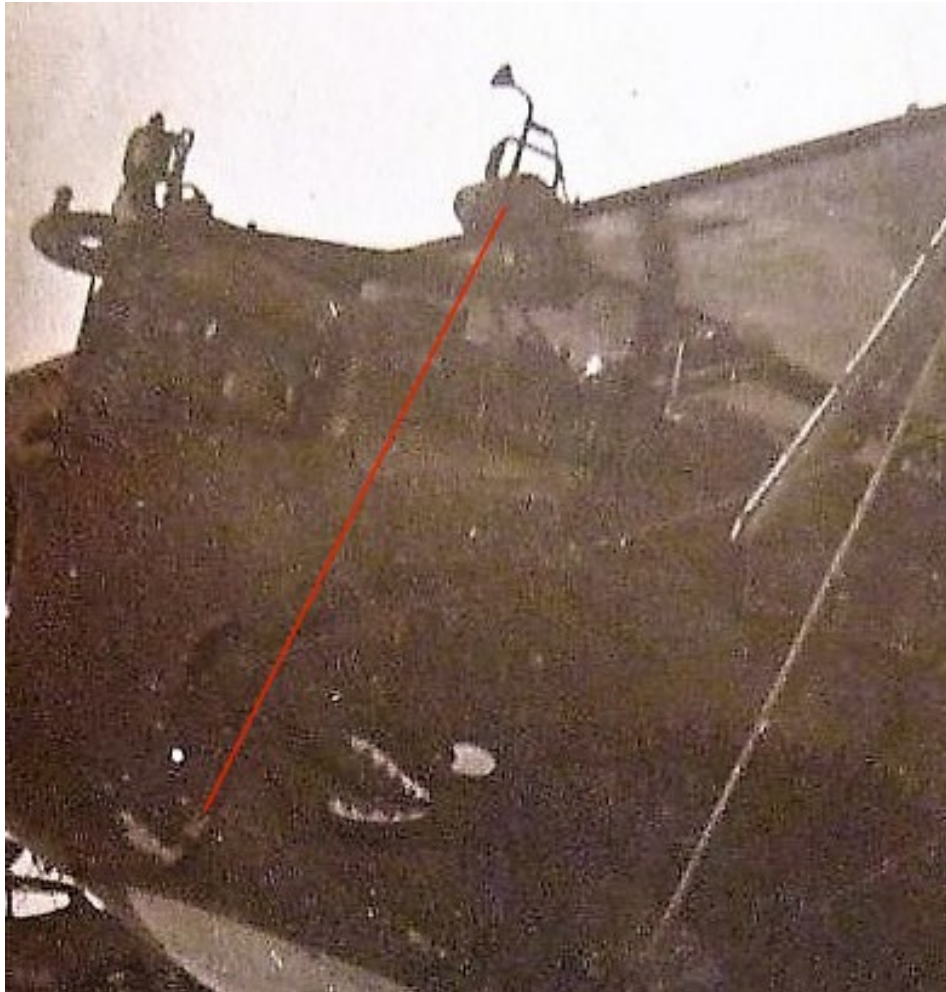
A third and final colour profile was created for this aircraft when operating as Schusta 27b from the Villers-au-Tertre Aerodrome during the later part of 1917 to the earlier part of 1918 and probably later as Schlachtstaffel 'Schlasta' 27b (Battle Squadron).

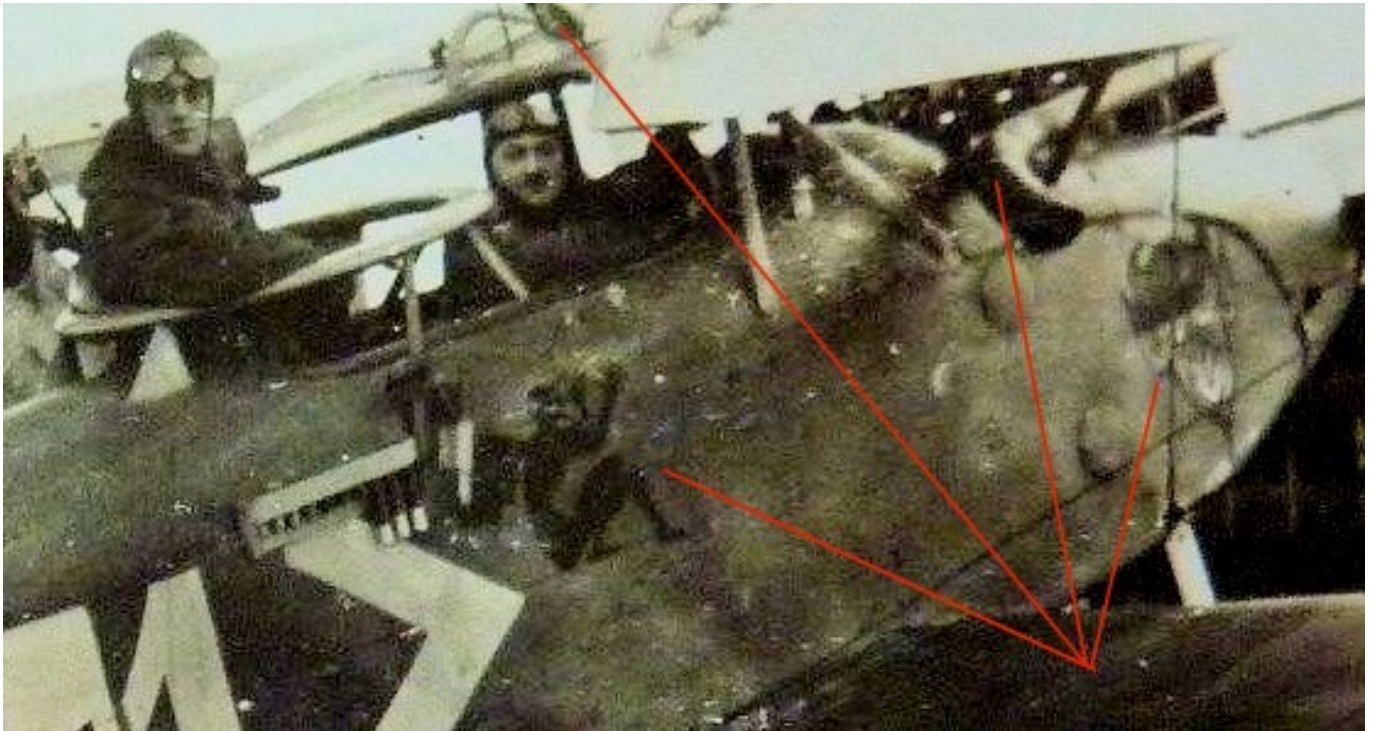
According to the 'Mirage' 1/48th scale model kit, this aircraft was fitted or recovered with wings which had the later darker 5 colour lozenge covering on the upper surfaces and the lighter 5 colour lozenge on the undersides of the wings. Also that the devil dog marking may have been painted red. However, it is possible that in fact this was a replacement aircraft for the previous 'ANNI' lost in a crash.

The colour profile shows that all upper and lower surfaces and the wheel coverings had the darker/lighter lozenge. This may be artistic license as it's debatable whether the lozenge coverings for the tail unit and wheels would have been replaced just in order to match that of the wings. However, it would be the case if the entire aircraft was a factory delivered replacement.

There are photographs of this aircraft that show various details, some of which are not noted or included in the kit. However, it is probable that these photographs were taken at different times in the aircraft lifespan, so differences are inevitable.

1. The auxiliary coolant gravity tank above the radiator in the upper wing.
2. The apparent different colour tones painted on the 'Devil Cat'.
3. The word 'ANNI' was at some stage outlined with white.
4. The engine exhaust was changed to an Adolf Stern Type 63, as used on for example the Albatros D.V.
5. A figure and a devil's head were added to the fuselage starboard (right) side.
6. A rear view mirror for the pilot was fitted to the centre section of the upper wing.





It's uncertain when any or all of these differences were implemented on this aircraft. Also the quality of the photographs makes it extremely difficult to define with any certainty the colours or shapes of the painted markings.

Therefore, I chose to base the model on the third colour profile with the overall dark/light lozenge and create the decals for the black 'Devil Cat', 'ANNI', the imp and devil face.



# PART 1 MODEL KIT

## **PART 1 - MODEL KIT**

(‘Wingnut Wings’ - Kit No:32049)

Normally here I would write a basic description of the model, noting any points of interest or flaws. However, there is a good review of the kit online. Paste the link below into your internet browser to view the review.

[https://www.hyperscale.com/2019/reviews/kits/wingnutwings32049reviewjh\\_1.htm](https://www.hyperscale.com/2019/reviews/kits/wingnutwings32049reviewjh_1.htm)

### **The model:**

The aircraft being modelled is based on the colour profiles created by R.N.Pearson, which depicts the three versions of the Halberstadt Cl.II ‘Anni’ of Schusta 27b, based at Villers-au-Tertre Aerodrome, Winter 1917-18.

These colour profiles shown that the aircraft was an early version of the Halberstadt Cl.II, which had the pilots machine gun located on the port (left) side of the forward cockpit coaming. However, they also show the auxiliary water tank located above the radiator in the upper wing, which was only fitted to the later version aircraft. Also there are no tailplane to fin bracing wires shown, which were fitted to aircraft of both versions.

There does not seem to be any photographic evidence of this particular aircraft available, so there is some doubt as to the validity of the colour profiles.

### **Decals:**

The decal sheet provides some of the markings required for the aircraft being modelled. Unique markings will need to be printed or applied using masks. I chose to replace the kit supplied lozenge decals with the equivalent decal sheets from ‘Aviatic’.

‘Aviatic’ Halberstadt Cl.II 5 colour lozenge upper surfaces (ATT32196)

‘Aviatic’ Halberstadt Cl.II 5 colour lozenge lower surfaces (ATT32199)

‘Aviatic’ Halberstadt Cl.II 5 colour lozenge tail surfaces (ATT32205)

‘Aviatic’ Halberstadt Cl.II 5 colour stipple upper surfaces (ATT32209)

### **Propeller:**

The kit supplied propellers represent types manufactured by either ‘Niendorf’, ‘Axial’ or ‘Garuda’. As there is no available photograph or information on this particular aircraft, any of these kit supplied propellers could be used.

However, I prefer to replace the kit supplied propellers, where possible, with a hand made wood laminated ‘Garuda’ (WP-020) propeller from Alexey Belov of ‘Proper Plane’.

### **Parts not required:**

The parts of this kit not needed for this model build required are highlighted in light blue on page 2 of the kit instruction manual. Also some alternative parts are shown in the instruction manual where they apply. In addition the kit supplied propellers are not required, as they will be replaced with aftermarket parts.



# PART 2

# WOOD EFFECTS

## PART 2 - WOOD EFFECTS

### General:

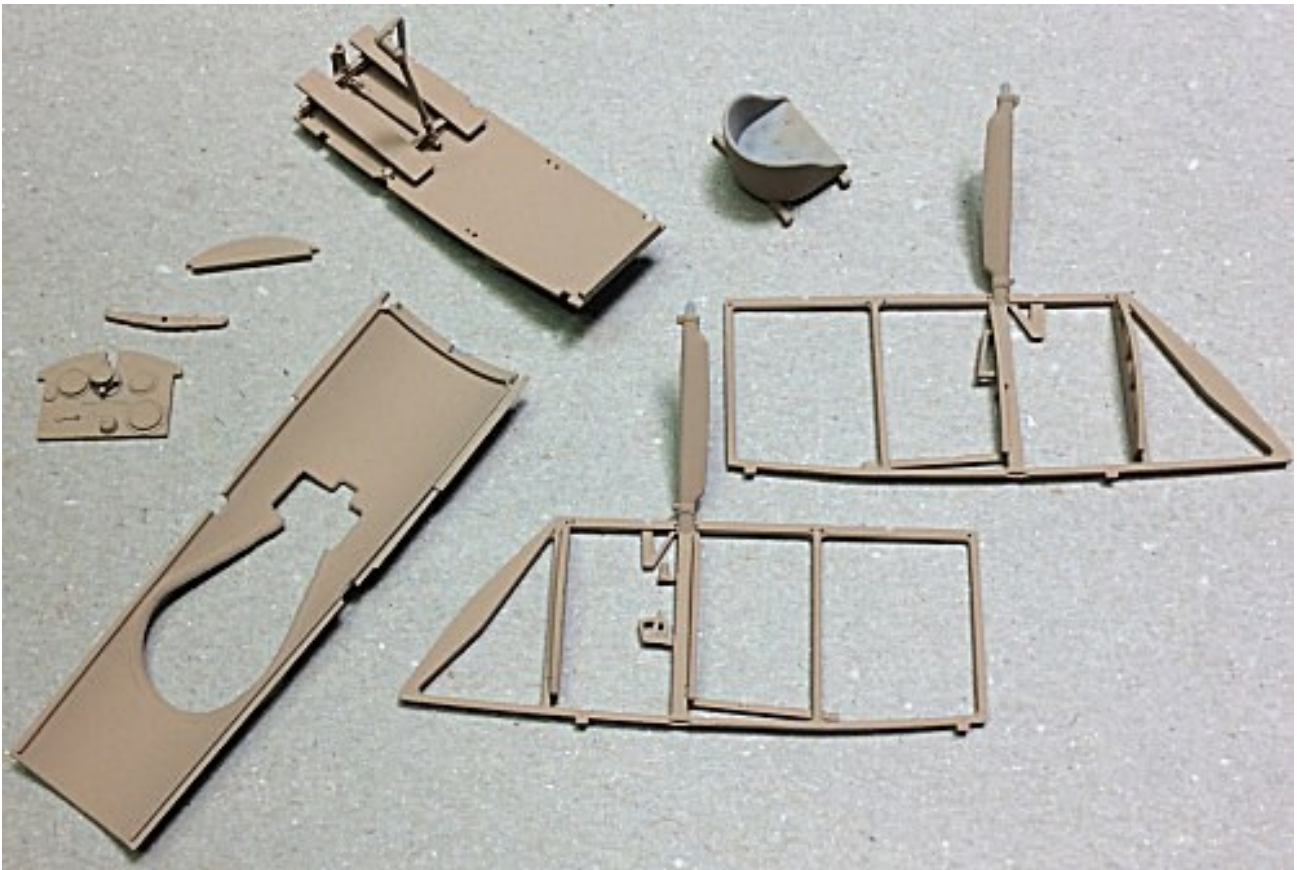
Parts of the model that are supposed to be made of wood can prove to be a challenge to replicate a wood finish to the part. Some after market companies produce accurate wood decals, which can be used to cover larger areas, such as cockpit decking and fuselage panels. However, decals can't easily be used to create realistic wood finish to smaller items or parts that don't lend themselves to having decals applied. To do this requires brush painting, using such as acrylic or oil paints, which can be enhanced with various washes or filters.

The first thing to do is to ensure the model parts are cleaned, normally with warm water with washing up fluid and something like an old tooth brush. Once cleaned and thoroughly dried, the primer coat can be applied. I use 'AK Interactive' Grey (AK758) or White (AK759) acrylic primer. Once the primer is dry, you can start applying the wood effect to the applicable parts, such the cockpit framework, decking, seat supports, rudder bar, instrument panel and of course, the wing struts and propeller. With practice, this method can also be used on larger areas, such as fuselage panels.

### Preparation:

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, when I add a few drops of 'Mr. Colour' Levelling Thinner', which aids brush painting. For most wood effect, I use 'Tamiya' Wooden Deck Tan (XF78) or Dark Yellow (XF60), suitably thinned with 'Tamiya' Thinners (X20A). Allow this base coat to fully dry (if you can't smell the paint, then it's dry).

### Example of base coat using 'Tamiya' Wooden Deck Tan (XF78)



## Wood effect - Method 1:

### DecoArt Crafters Acrylic' paints:

For the next step I use 'DecoArt Crafters Acrylic' paints, either Burnt Umber or Burnt Sienna. These are similar to standard acrylic oil paints, but are water based instead of oil 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. In addition, the paints dry as quickly as normal acrylic paints, avoiding the disadvantage of using true oil paints, which can take days to fully dry.

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. For larger areas, such as decking or panels etc I use a small piece of fine sponge to apply the paint.

Apply the paint to the applicable item, using light strokes and in the required direction. 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 or sponge it off immediately before it dries. Although the paint is water based, don't try to thin any applied paint with water as it will lift the paint, which builds up into clumps. If required, a second light coat can be applied. Always wait until a first coat has fully dried before applying a second coat, otherwise the first coat will 'drag' and lift from the surface.

Once painting is complete, clean the brush in water.

Below is an example of the Burnt Umber oil paint applied to a cockpit side frame.



## **Wood effect - Method 2:**

Windsor & Newton' Griffin (Alkyd) oil paints:

**NOTE:** *The wood effects can also be achieved using 'Windsor & Newton' Griffin (Alkyd) paints.*

Mask off the area as required.

**NOTE:** *When airbrushing 'Tamiya' acrylic paints, I thin the paints using 'Mr. Colour' Self-Levelling Thinners (400), which is commonly referred to as 'unicorn tears' or just 'MLT'.*

Airbrush the areas with 'Tamiya' Dark Yellow (XF60) or similar.

Brush a covering coat of the 'Windsor & Newton' Griffin Alkyd paint , such as Burnt Sienna, over the areas.

Leave the oil paint to settle for about ten minutes.

Decant a small amount of White Spirits into a suitable dish.

Dip a broad flat oil brush into the White Spirit then wipe the brush on a sheet of kitchen roll, which should not deposit any fibres in the oil paint.

Brush the oil paint over the area, in the desired direction, wiping the brush on the sheet of kitchen roll to remove residual oil paint.

Repeat dipping and wiping the brush in the White Spirits and brushing the oil paint until the desired density and finish is achieved.

Leave the oil paint to fully dry, which normally takes approximately 24 hours.

If desired and once the oil paint is fully dry, airbrush a semi-gloss clear coat, such as 'Alclad' Satin (ALC312) or similar, with a few drops of 'Tamiya' Clear Orange (X26) to give a varnished look to the finish.

## **Surface finish:**

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. If using the 'Tamiya' Clear I add 'Mr. Colour' Levelling Thinners, which does improve airbrushing and avoids pooling. Otherwise I use 'Alclad' Light Sheen (ALC-311).

Although it's a lacquer, I've found that it will accept 'Tamiya' 'Clear' coloured Acrylics without any separation, which can happen with other paints. The 'Alclad' lacquers dry fast and provide 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 the following example, I added a few drops of Clear Yellow (X24) into the 'Alclad' Light Sheen (ALC -311) 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 to airbrush the sealing coats over the various cockpit items. The first coat usually 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 first coat has dried, I airbrushed several coats of just 'Alclad' Light Sheen (ALC -311), which added not only more sealing coats, but more importantly gave the desired semi-gloss 'varnished' finish I was after.

Below is an **example** of the applied 'Alclad' lacquer/X24 mix on the propeller.



**NOTE:** *Once you are confident using this method of replicating wood finishes, you can vary both the colour of the acrylic base coat and tinting of the sealing coat, to replicate other types of wood used in aircraft construction.*

Once the lacquer coats are thoroughly dry, any detail painting, decals or final weathering can be applied to the parts, as required.

# PART 3

# WEATHERING

## **PART 3 - WEATHERING**

There are many different types of weathering mediums available now to modellers of aircraft, ships, vehicles and figures, in model of any type. These weathering mediums can be washes based on enamel, clay or ink. Weather pastels, applied by sponge' as well as oil paints of various sorts are also plentiful. Some modellers have even used water colour paints, and pencils. The following are the basic weathering mediums I tend to use on most of my models.

### **Flory Model clay washes:**

The washes I tend to use are the 'Flory Models' Clay Wash 'Grime' and 'Dark Dirt', which come in various shades and consist of a suspended and 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 soft brush to remove as much of the clay wash as you need to achieve the desired effect. The kitchen roll can be used dry or very slightly dampened. If dampened, the dried clay is re-activated and the clay wash can be more easily be removed or worked as required.

First I seal the surface with an airbrushed semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311), which dries quickly. A gloss coat tends to stop the clay wash 'gripping' the surface when it is applied and it can run off or just puddle. A more matte coat can cause the clay wash to 'grip' too much, making it difficult to remove or even to wash it off completely.

**NOTE 1:** The more glossy the applied sealing coat is, the more the chance there is that the applied 'Flory' clay wash will not spread fully, but rather form puddles or beads of wash. If this happens, add a few drops of ordinary kitchen washing up liquid to the clay wash. This will break the surface tension of the wash, allowing it spread fully.

**NOTE 2:** Always decant the amount of clay wash you need, rather than dipping the brush directly into the wash bottle. Dipping into the wash bottle can transfer contaminants from the brush into the wash, will can cause the wash to become thick and unusable.

**NOTE 3:** When a sealing coat is applied over areas treated with clay wash weathering, the intensity of the applied wash tends to darken. This should be considered when removing the clay wash, otherwise the final effect may appear too dark.

**NOTE 4:** 'Flory' current range of washes are: Dark Dirt, Grime, Black, Light (white), Mud, Sand, Rust and Concrete. All of these washes can be mixed to create many colour shades for different weathering finishes.

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. If you don't achieve your desired effect, you can wash it all off and start again. Use a soft brush or absorbent kitchen roll, which are dry or **very slightly** dampened, to brush or wipe off the clay wash in the direction of airflow over the model. Even then, dab them onto a dry piece of the paper, until they are almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you can re-apply the wash and start again. If you're 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. Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied. The technique is to 'damp' brush or wipe 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 within 30 minutes. Then very lightly brush and/or use a piece of damp absorbent paper to remove as much you want until you get the desired effect. Once finished, run the brush under a tap to rinse out any residual clay pigments. Finally, seal the surface with your chosen clear coat, which will seal in the applied clay wash.



### **Chipping effects:**

To give the effect of chipped and weathered paint/varnish to metal engine cowls and forward fuselage panels etc, chipping fluids can be used. To achieve this effect, first prime the areas with a suitable primer then airbrush the metallic finish desired. Once dry, a chipping fluid, such as 'AK Interactive' Medium Chipping fluid or 'Vallejo' chipping fluid is airbrushed over the painted areas. An alternative is to use a cheap hair spray. This forms a barrier which will allow the top coat to be chipped off. Finally the required top coat colour is applied.

Once fully dry, moisten the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently teased off the top coat paint. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed coat of 'Alclad' Light Sheen (ALC-311).



**'Tamiya' Weathering Master sets:** Each of these 'Tamiya' produced weathering sets contain three 'tablets' of different colours and an applicator, which has a brush on one end and a sponge on the other. The tablets have a wax look and feel and can be applied onto painted surfaces to reproduce various finishes. It's best to use these as the final surface treatment, as being a 'Wax', any treated surfaces can't be painted or sealed.





**Pigments:** Pigments, such as those produced by 'Flory Models' or 'Humbrol' are effectively very fine 'dusts', which can be applied to a model to re-create dust, dirt, stains etc. They can be applied by dry brushing or mixed with other mediums to create paintable solutions.



**Washes:** Washes can be applied to either enhance panel lines etc or to add a 'filter' of colour onto a painted surface. They can be purchased ready made from various manufacturers or can be 'home made' using such as oil paints with a suitable thinning agent. I tend to use 'AK Interactive' products.



### **Water colour pencils:**

Water colour pencils can be used to add weathering detail. The colour s applied to the model part then brushed gently with a brush, slightly dampened with water. This dilutes the pencil marking, allowing it to be faded as desired. 'AK Interactive' produce these 'weathering' pencils, which are marketed specifically for the modeller, although other artist water colour pencils can be used, such as 'Derwent' Inktense 24 ink pencils.



**Oil paint:** A technique used more frequently now is oil paint 'dot and drag'. Basically an oil paint of the desired colour is placed onto a piece of cardboard, which over a hour or so, soaks out the oil in the paint, leaving a drier pigment. The pigment is 'dotted' onto the painted surface where it is required then dragged with a brush previously wetted with 'Tamiya' X20 enamel thinners then wiped virtually dry.

Softly 'flick' the brush to drag the pigment in the direction required, which will blend it in a thin layer.

The amount of pigment left showing depends on the effect you require. Always keep the brush wiped clean to avoid a build up of pigment and remoisten and wipe dry often. The more paint you drag, the less pigment is left showing. Blending different coloured pigments can create stains from smoke/gun blast, rain marks/runs, dirt/dust and oil/fuel stains.

A good quality oil paint and thinners are essential to produce a good finish. Some quality oil paints can be too 'gritty' when leached of oil, so I use 'Abteilung 502' oil paints and 'Tamiya' Enamel thinners (X20).



# PART 4

# DECALS

## PART 4 - DECALS

### Standard decals:

**NOTE:** *The following is **applicable only** for decals on a **painted surface**. If decals are to be placed on top of **previously applied decals**, the decal setting solutions may 'eat' into the previous decals. In this case a sealing coat of either 'Alclad' Gloss (ALC-310), 'Alclad' Aqua Gloss (ALC-600), Tamiya' Clear (X22) or 'similar should be airbrushed over the first decals, to provide a barrier against the setting solutions.*

Ensure the painted surface is smooth and free from any surface imperfections.

Airbrush a sealing coat of 'Alclad' Gloss (ALC-310), 'Alclad' Aqua Gloss (ALC-600), 'Tamiya' Clear (X22) or similar to provide a smooth surface.

**NOTE:** *'MicroSet' solution softens the decal to allow it to conform to the painted surface. Do not attempt to move the decal too much or it may tear.*

Wet the area using a light coat of 'MicroScale' **MicroSet** solution.

Apply the decal after it has soaked in 'warm' water enough to start to loosen the decals from its carrier backing.

Carefully move the decal into the correct position.

Carefully press out any residual water from the decal by either pressing with a tissue or by gently rolling over the decal with a cotton bud.

**NOTE:** *'MicroSol' solution will soften the decal to allow it to conform fully to the painted surface. The solution usually causes the decal to wrinkle, but this is normal as the decal semi-dissolves to the surface. Once the solution has been applied, never try to disturb the decal as it will tear. Leave the solution for several hours to do its job, after which the decal will return to a smooth surface, but conformed fully to the painted surface.*

Wet the decal surface with a light coat of 'MicroScale' **MicroSol** solution.

Leave the solution for several hours to fully dry and set the decal.

Once fully dry and set, airbrush a sealing coat over the decal, dependant of your desired finish. I tend to use either 'Alclad' Light Sheen (ALC-311) lacquer or 'Tamiya' Semi Gloss (X35).

Once the decal is correctly positioned, use a flat brush to brush the water out from under the decal, working from the centre of the decal out towards the edges. I then use a dry cotton bud in the same manner. Finally, wearing cotton gloves, I apply slight pressure and slide my fingers across the decal to finally push the decal onto the surface.

Once the decals have been applied I airbrush a sealing coat of either 'Alclad' Clear Coat Gloss (ALC-310) lacquer ), 'Alclad' Aqua Gloss (ALC-600), 'Tamiya' Clear (X22) or similar over areas of decals where more decals are to be applied.

Once the decals have been applied and are dry I airbrush a final sealing coat of 'Alclad' Light Sheen (ALC-311) or 'Tamiya' Semi-Matt (XF35) over the decals.

To 'knock back' the sheen for applying weathering effects (refer to Part 3 of this build log), for example 'Flory' clay washes or oil paint, I airbrush a sealing coat 'Alclad' Light Sheen (ALC-311) mixed with Flat (ALC-314) at a 3 to 2 ratio.

### **'Aviattic' decals:**

The 'Aviattic' decals are different in both production techniques and application to those of the more traditional decal manufacturers. Traditional decals are normally created using processes such as silk screen printing and are pre-shaped for the particular model markings. When placed in warm water they will detach from the backing sheet and can then be slid onto the model surface and when they are correctly positioned, wiped with a semi-dry brush or cotton bud etc, to expel any water from under the decal. Once fully dry, decal softeners, such as 'MicroSol' and/or 'MicroSet' can be applied, if necessary, to 'weld' the decal to the model surface. Finally a sealing coat of acrylic or lacquer gloss, semi-matt or flat is applied over the decal, to seal and protect the seal and protect the decal.

However, 'Aviattic' decals are laser printed onto a very fine carrier film and although this film is thin, the decals are remarkably resilient and somewhat 'stretchy' when being applied. This allows them to be more easily moved and positioned before being finally applied. Also with most other decals, I've used softeners to help the decals conform to surface irregularities and contours, which is something I've found is not really required for 'Aviattic' decals, due to the nature of the carrier film. In addition, the decals need to be cut out from the sheet, so care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. That said, minor gaps may be able to be covered with weathering. For more information, refer to the 'Aviattic' instruction sheet supplied with the decals.

'Aviattic' decals are laser printed onto either 'clear' or 'white' backing, the 'clear' being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals.

### **Application:**

First airbrush the parts to have decals applied with a primer coat of such as 'AK Interactive' White (AK759) or Grey (AK758) or similar light colour for 'clear' backed decals or 'AK Interactive' Grey (AK758) for 'white' backed decals.

**NOTE:** *'Silvering' is caused by air being trapped in the rough surface of the paint, such as on a matte finish, which after the decal is applied and dries, causes silver sheen patches showing in the decal ('silvering').*

Once dry, check the surfaces for any imperfections, such as trapped dust or raised areas of paint, which will cause 'silvering' under the decals. Any surface imperfections found should be carefully sanded or polished out.

Airbrush at least two light sealing coats of a clear coat such as 'Alclad' Aqua Gloss (ALC-600) or similar over the painted surface to form a gloss surface for applying the decals.

**NOTE:** *The surface must be pre-wet with like warm water with. Care needs to be taken when you slide the decal from the backing sheet and onto the model surface, as the thin decal can fold over on itself.*

Soak each decal in warm water for approximately 20 seconds.

Wet the surface of the model where the decal is to be applied.

Carefully slide the decal onto the wetted surface. Make sure the decal does not fold over on itself.

Align the decal to the shape of the model part.

Using a broad, soft brush, brush the decal from the centre outwards to remove any water from under the decal.

Adhere the decal to the model part surface by either pressure rolling over the decal with cotton buds or, as I do, by wearing lint free cotton gloves and rubbing the decal with your fingers.

Check to make sure the decal is in full contact with the surface of the model part and that there are no areas exhibiting 'silvering' (trapped air under the decal). If so, gently prick through the decal and apply water then press out the water to adhere the decal back onto the model part.

Also check that there are no lifted decal edges around the model part.

Allow the decal to fully set, preferably overnight. Where decals have been applied to large areas, gentle heating using a hair dryer can accelerate the decal setting time.

Where decals cover location holes or other openings, prick or cut through the decal into the hole or opening then apply 'Tamiya' X20A thinners, which will soften and adhere the decal into the hole or opening. Using X20A can also conform decals around curves edges etc.

Protect and seal the decals by airbrushing a sealing coat over the decals. If more decals are to be added onto the applied decals a gloss sealing coat should be used. Otherwise a sealing coat of the desired finish can be applied, which should also be done once all of the required decals have been applied.

# PART 5

# RESIN



## PART 5 - RESIN

The figures for this model are cast in resin.

Below I have listed what I have found to be the primary differences for parts cast in resin as opposed to styrene (plastic) injection parts:

1. When resin kits are cast in their moulds, a release agent is applied to enable the cast resin parts to be more easily removed, which is similar to plastic kit moulding. This release agent can leave a film on the surface of the kit parts, which, if not removed, can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove this film is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then rinse all of the parts thoroughly and leave to dry. Alternatively wipe the parts with isopropyl alcohol (e.g. 'Tamiya' X20A thinners).
2. Resin, by its nature, is very brittle and can be damaged or broken easily, especially when handling small parts. This is particularly evident when separating the individual items from the resin cast. The best way to remove item is to cut them away with a razor saw, then clean them up afterwards.
3. Once removed from the resin cast, parts will normally have 'resin flash' around or amongst parts, especially small items. This is easily removed with a sharp scalpel blade. Heavier residue can be scraped, filed or sanded away.
4. Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. As most people know, it will also bond skin to whatever it touches, if the skin has CA adhesive on it. Obviously extreme care needs to be exercised when assembling resin kits using CA adhesive.
5. Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust in particular is dangerous, especially if inhaled. Therefore always vacuum the working area, and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working, then do so. Resin can easily be drilled or scraped, but remember how brittle resin is when it is being handled.
6. It is not unusual to find imperfections in resin cast parts, such as surface blemishes, small 'blow' holes or ragged edges. This can be common on some resin kits. These imperfections can be rectified by sanding/polishing and/or filling with modelling putty, then sanding/polishing.
7. Generally CA adhesive is supplied as 'instant bond' adhesive, but there are some manufacturers, such as 'VMS Fleky', that supply CA adhesive as standard, thin, slow and specific resin adhesive. Whichever adhesive is used you must ensure parts are correctly positioned and aligned before applying the adhesive. Trying to separate mis-aligned parts once the adhesive sets will prove very difficult and may result in irreparable damage to the parts.

# PART 6

# RIGGING

## **PART 6 - RIGGING**

### **References:**

'Wingnut Wings' instruction manual.  
On-line resources (various).

### **General:**

Before any assembly, painting or application of decals, you should check that rigging attachment points are drilled out (later in this build). Most models have these located on the model, but it's best to carry out research in reference books or research on line before drilling. Some modellers use micro drills manufactured for drilling printed circuit boards and these drill bits sometimes have identifying coloured collars fitted to the drill shanks to denote the drill diameters. I've found that care needs to be taken when using these drills, as they are 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. An alternative is to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use, although again, they are very fragile and can very easily be broken. Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/EZ thread etc, gluing in position and then rubbing down the exposed line 'tag' and then re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.

### **Wire wound rigging:**

The structural rigging and flight control cables were the standard wire wound cable.

The aircraft structural rigging was comprised of the landing wires, flying wires, incidence wires, drag wires and bracing wires. The flight control cables were for the rudder and elevator control. Aileron control was by cockpit operated rods and bell cranks out to the ailerons in the upper wing only

The wires and control cables were anchored at both ends with an adjustable 'turnbuckle' fitted for adjusting the tension in the wire or cable.

**NOTE:** *The following illustrations and photographs are intended to supplement the rigging and control cable illustrations on pages 5 and 16 in the 'Wingnut Wings' instruction manual.*

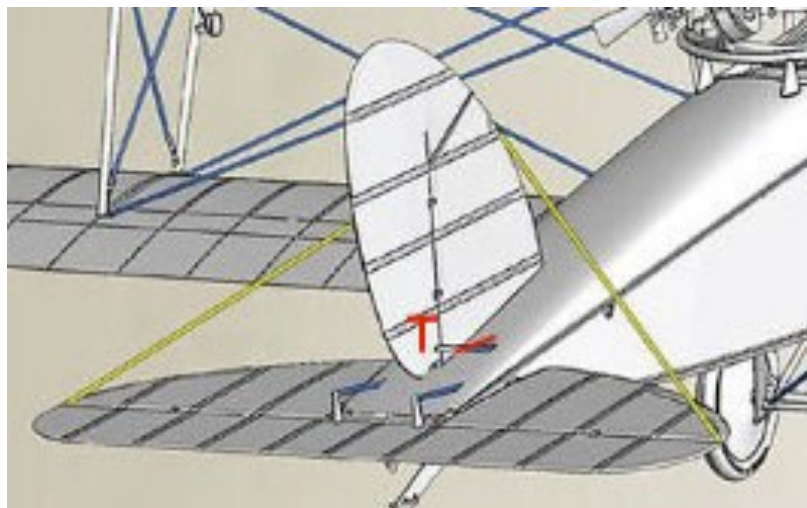
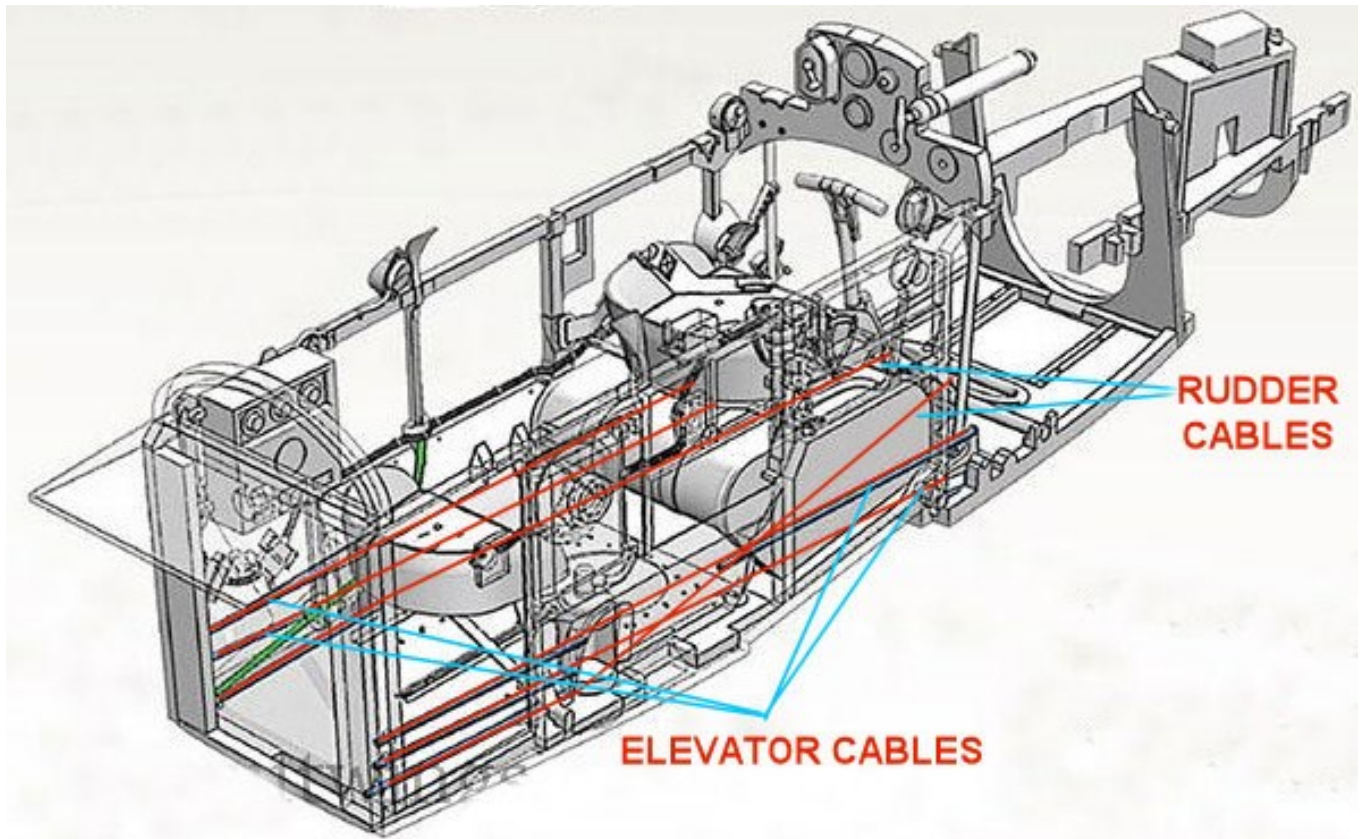
### **Flight controls**

#### **Rudder cables:**

Rudder control cables were attached to a flywheel at the bottom of the rudder bar. These two cables were routed rearwards under the pilots seat and through the rear cockpit and through to the rear of the fuselage. The cables exited through ports in the top, rear of the fuselage and rearwards, to be attached to the rudder control horn each side of the rudder.

As the pilot moved the rudder bar left or right, the control cable on one side would tension and pull the rudder in the required direction whilst the opposite cable relaxed, allowing the rudder to move. This movement of the rudder caused the aircraft to yaw in the required direction.

Adjustable turnbuckles were fitted to the cables at the rudder control horns.

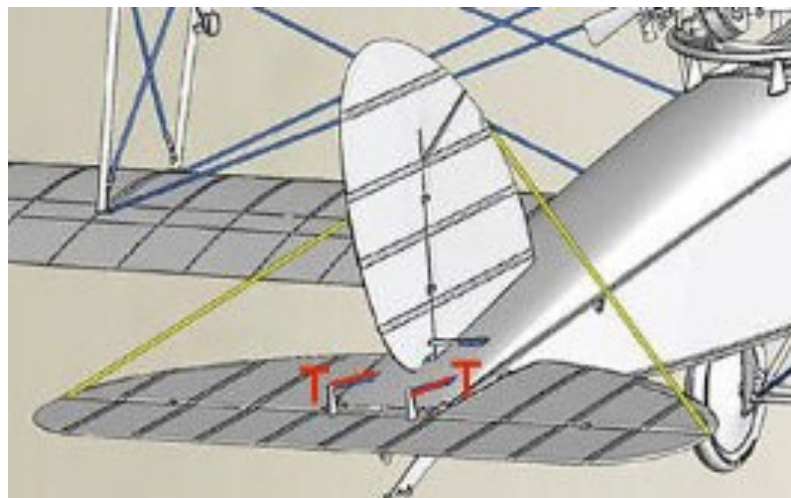
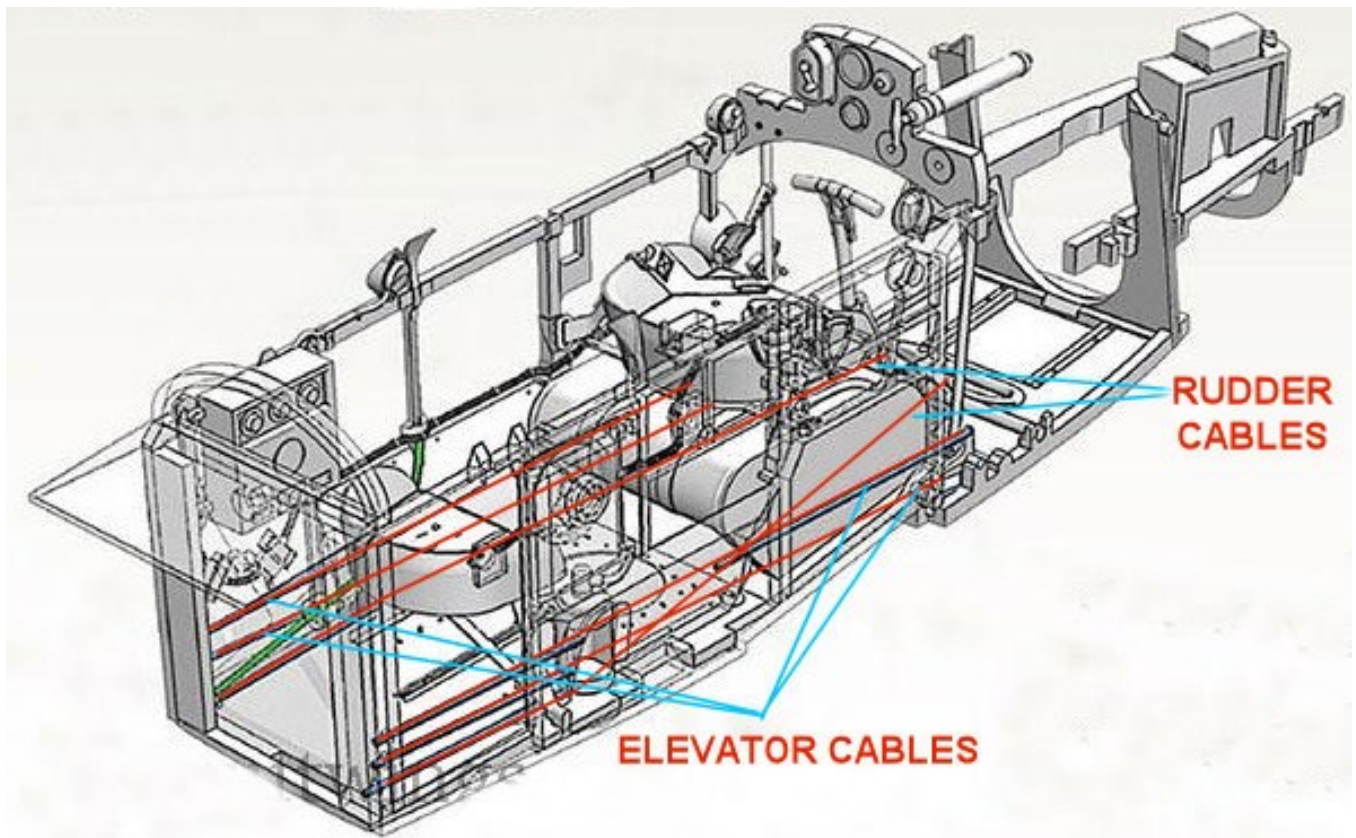


### Elevator cables:

The elevator control cables were attached to levers on the ends of a cross bar, which was attached to the pilot's control column. Elevator upper control cables were attached to the cross bar top levers and elevator lower control cables were attached to the cross bar bottom levers. These two cables were routed rearwards under the pilot's seat and through the rear cockpit and through to the rear of the fuselage. There the upper cables exited through ports in the top, rear of the fuselage and rearwards, to be attached to the upper elevator control horns each side of the elevator. The lower control cable exited the underside, rear of the fuselage and were attached to the underside elevator control horns each side of the elevator.

As the pilot moved the control column forwards or rearwards, the upper or the lower pair of control cables would either tension and pull the elevator up or down whilst the opposite pair of cables relaxed, allowing the elevator to move. This movement of the elevator caused the aircraft to climb or dive (pitch) in the required direction.

Adjustable turnbuckles were fitted to the cables at the elevator control horns.



Aileron control:

Aileron control was effected by rods attached to a cross bar behind the control column. These rods were routed up and out of the cockpit to bell cranks in the centre section of the upper wing. Tubes from the bell cranks were routed outboard to the ailerons. As the pilot moved the control column left or right, the joints on the ends of the cross bar caused the vertical rods at one end to move up and the other end down. This vertical movement of the rods rotated the bell cranks in the upper wing, causing the connected tubes to rotate in the required direction. This caused the aileron on one side of the upper wing to lift and the opposite aileron to lower, causing the aircraft to bank (roll) in the required direction.

As such, no control cables are required for the ailerons.

## Structural rigging

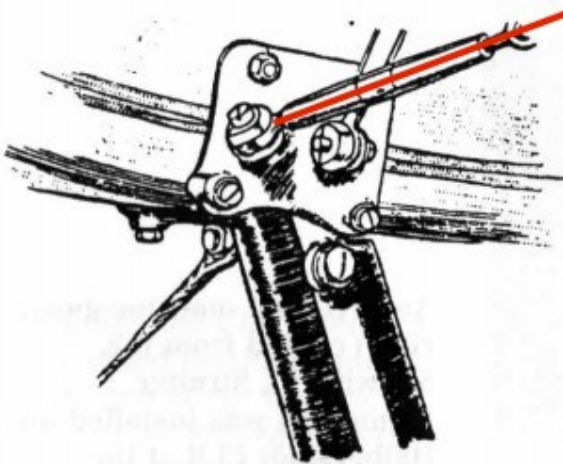
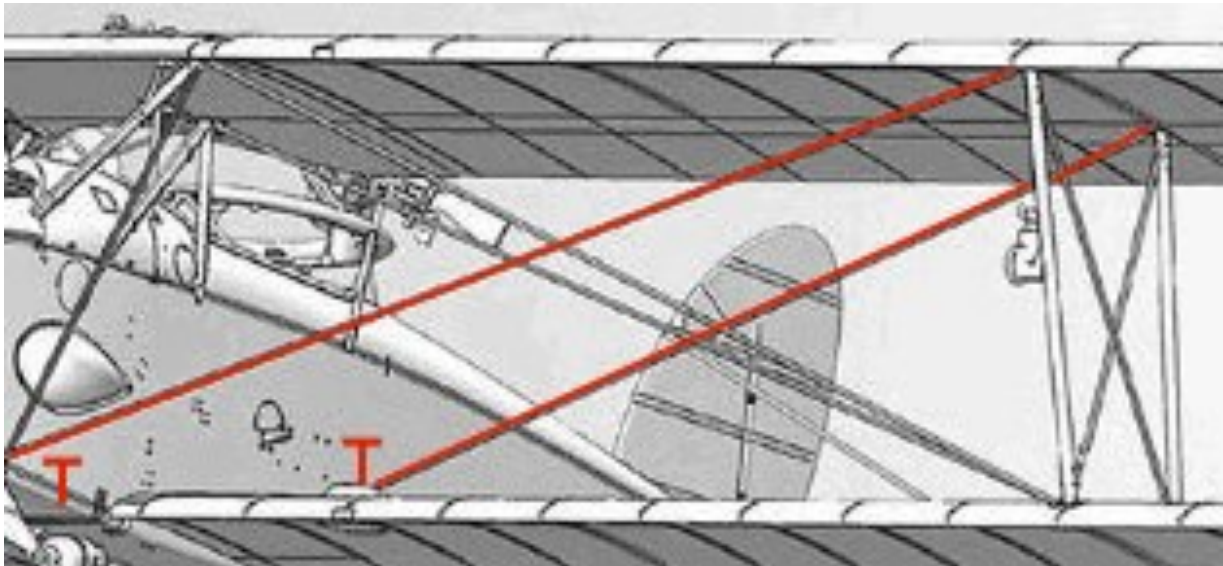
### Flying wires:

Two flying wires were fitted to both sides of the aircraft.

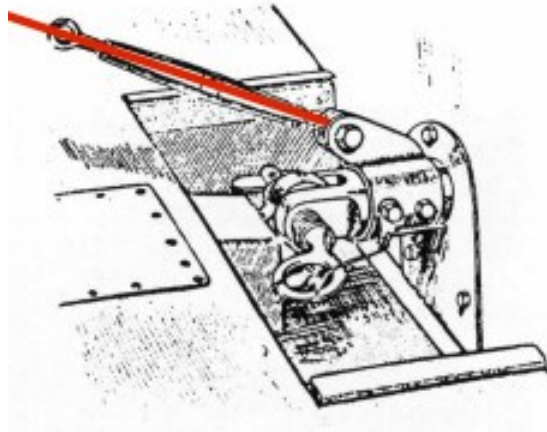
A single wire was attached to the bottom edge of the fuselage at the top of the landing gear forward strut and routed up and out to the underside of the upper wing at the top of the forward interplane strut.

A second single wire was attached to the bottom edge of the fuselage at the rear spar and routed up and out to the underside of the upper wing at the top of the rear interplane strut.

Adjustable turnbuckles were fitted to the wires at the fuselage.



Landing gear forward strut



Lower wing rear spar

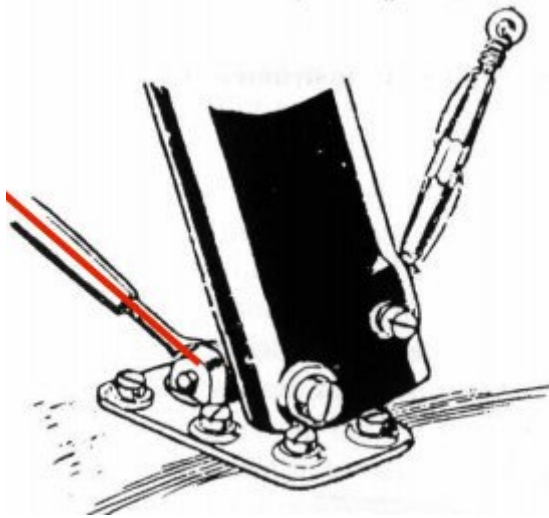
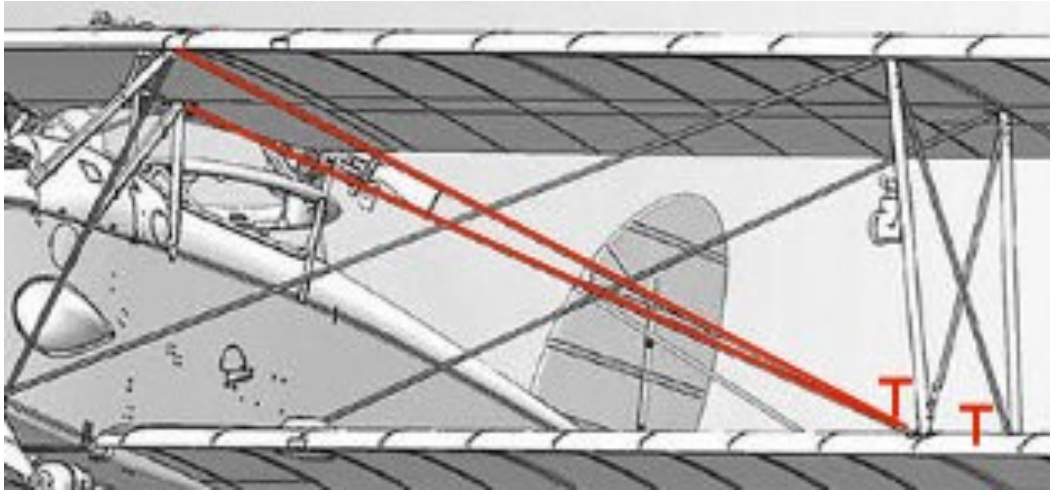
### Landing wires:

Two flying wires were fitted to both sides of the aircraft.

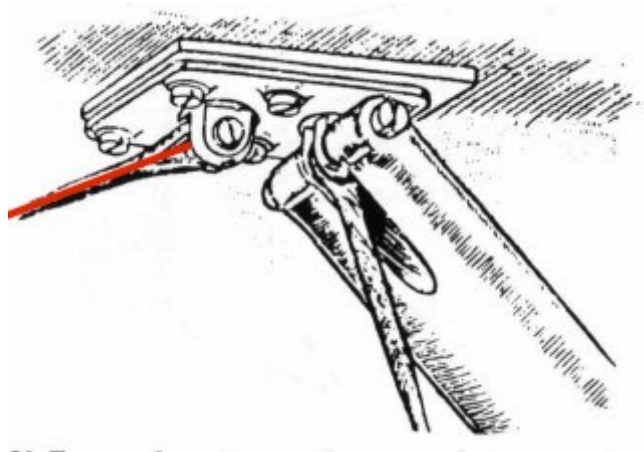
A single wire was attached to the top surface of the lower wing, at the base of the forward interplane strut and routed up and in to the underside of the upper wing at the top of the forward cabane strut.

A second single wire was attached to the top surface of the lower wing, at the base of the rear interplane strut and routed up and in to the underside of the upper wing at the top of the rear cabane strut.

Adjustable turnbuckles were fitted to the wires at the lower wings.



Forward interplane strut

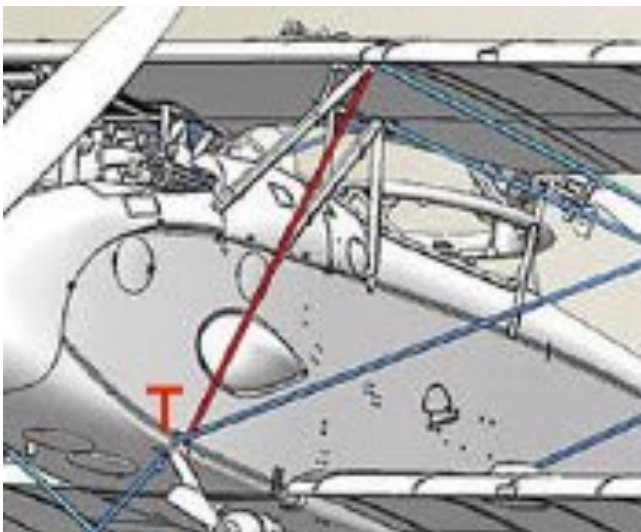


Top of fuselage forward cabane strut

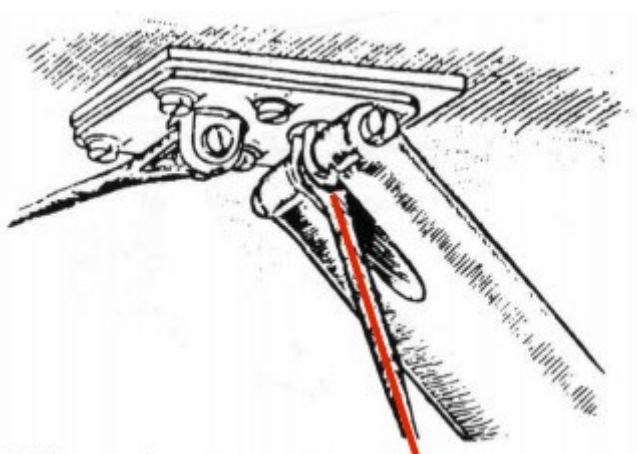
Drag wires:

A single drag wire was fitted to both sides of the aircraft. A wire for each side was attached to the bottom edge of the fuselage, at the top of the forward strut of the landing gear and was routed up to the underside of the upper wing, at the top of the forward cabane struts.

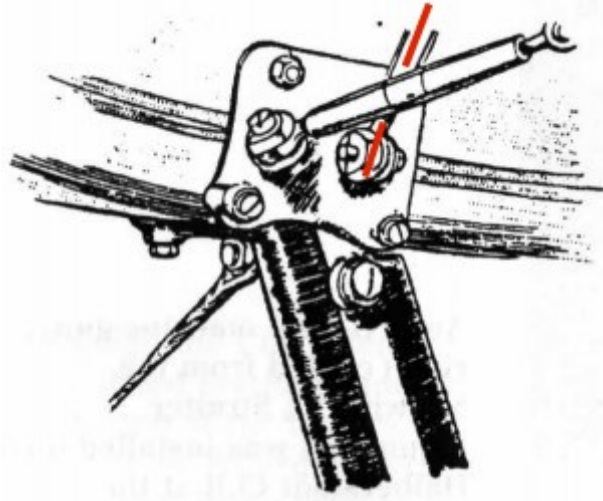
Adjustable turnbuckles were fitted in the wires at the fuselage.



Top of fuselage forward cabane strut.



Landing gear forward strut

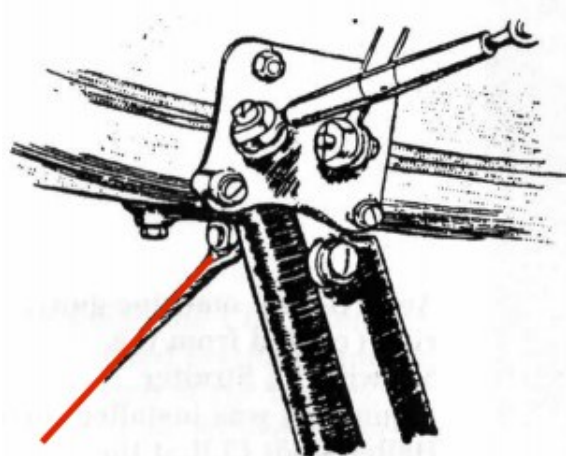
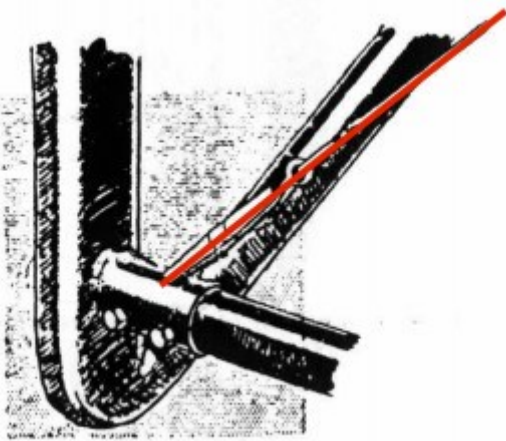
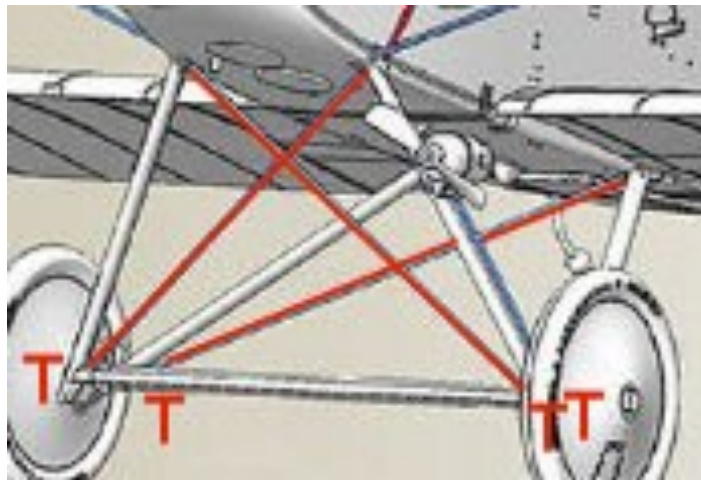


Landing gear bracing wires:

Two pairs of crossed bracing wires were fitted between the struts of the landing gear. One pair of wires were attached at the top of the landing gear rear struts and were routed forward, down and crossed to the either the rear ends of the landing gear axle or base of the landing gear 'V' strut.

A second pair of wires were attached at the top of the landing gear forward struts and were routed down and crossed to the either the ends of the landing gear axle or base of the landing gear 'V' strut.

Adjustable turnbuckles were fitted in the wires at the landing gear.



Landing gear forward bracing wire

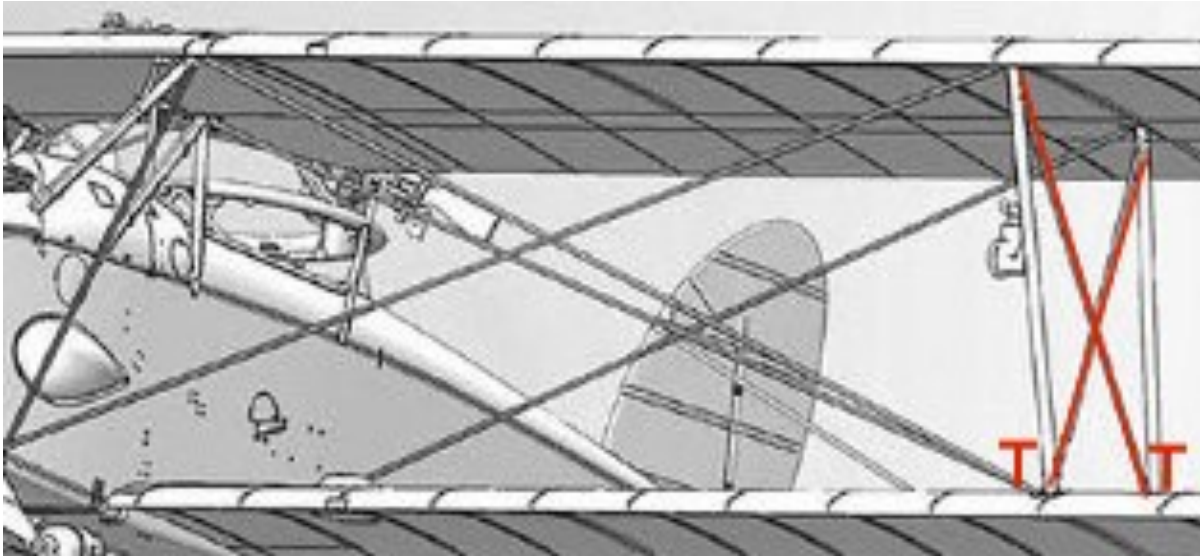


### Incidence wires:

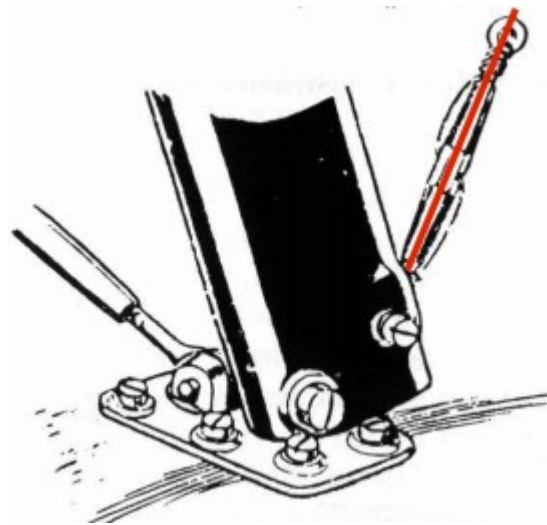
A pair of crossed bracing wires were fitted both sides of the aircraft between the interplane struts. One wire was attached on the top surface of the lower wing at the bottom, rear of the forward interplane strut. This wire was routed up to the underside of the upper wing, forward from the top of the rear interplane strut.

A second wire was attached on the top surface of the lower wing at the bottom, front of the rear interplane strut. This wire was routed up to the underside of the upper wing, rear of the top of the forward interplane strut.

Adjustable turnbuckles were fitted to the wires at the lower wings.



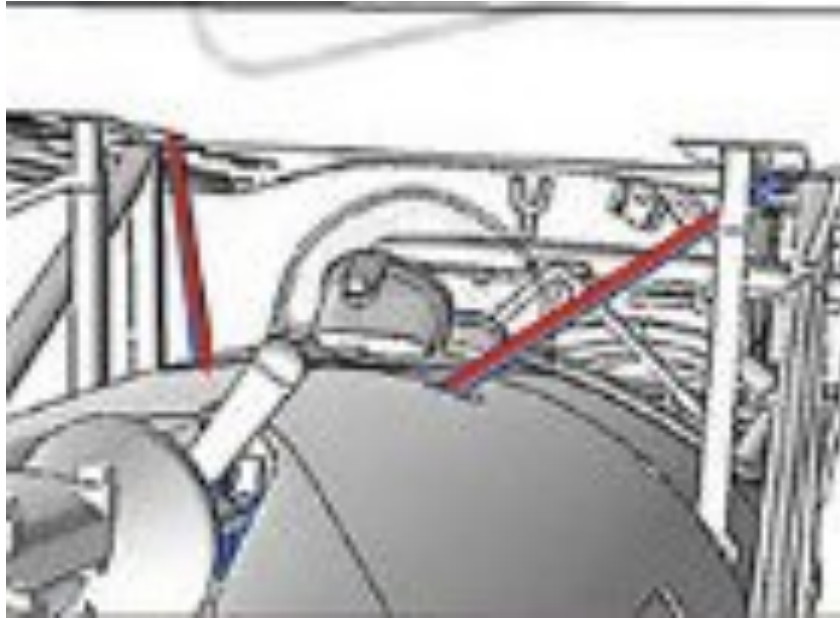
Bottom of forward interplane strut



### Rear cabane bracing wires:

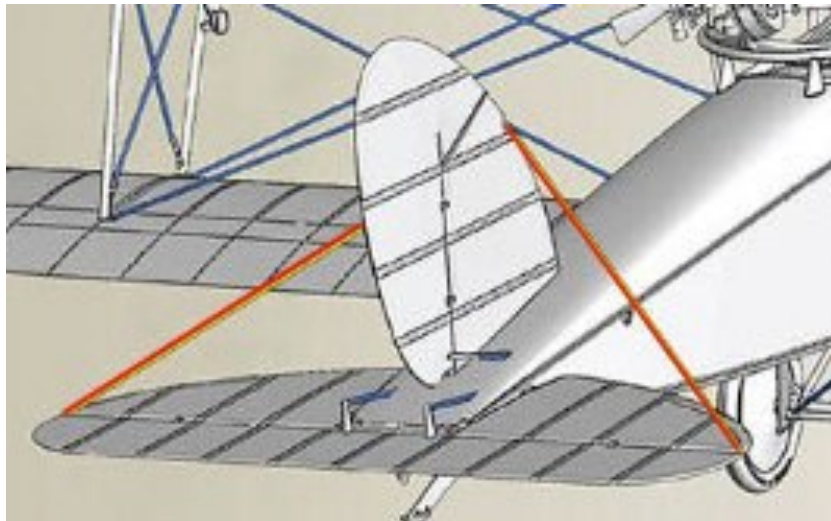
A bracing wire was fitted from each side of the pilots windscreen to the underside of the upper wing at the top of the fuselage rear cabane struts. The wires from inside the fuselage passed through the cockpit front coaming, in front of and at the sides of the pilots windscreen. The wires were routed up and outboard to the underside of the upper wing centre section at the fuselage rear cabane struts.

No adjustable turnbuckles appear to be externally visible, so will not be fitted.



Tail unit bracing wires:

The only concession to this is **not including** the tailplane to fin bracing wires, which photographs mostly show were not fitted to either version of the aircraft.



# PART 7

# ENGINE

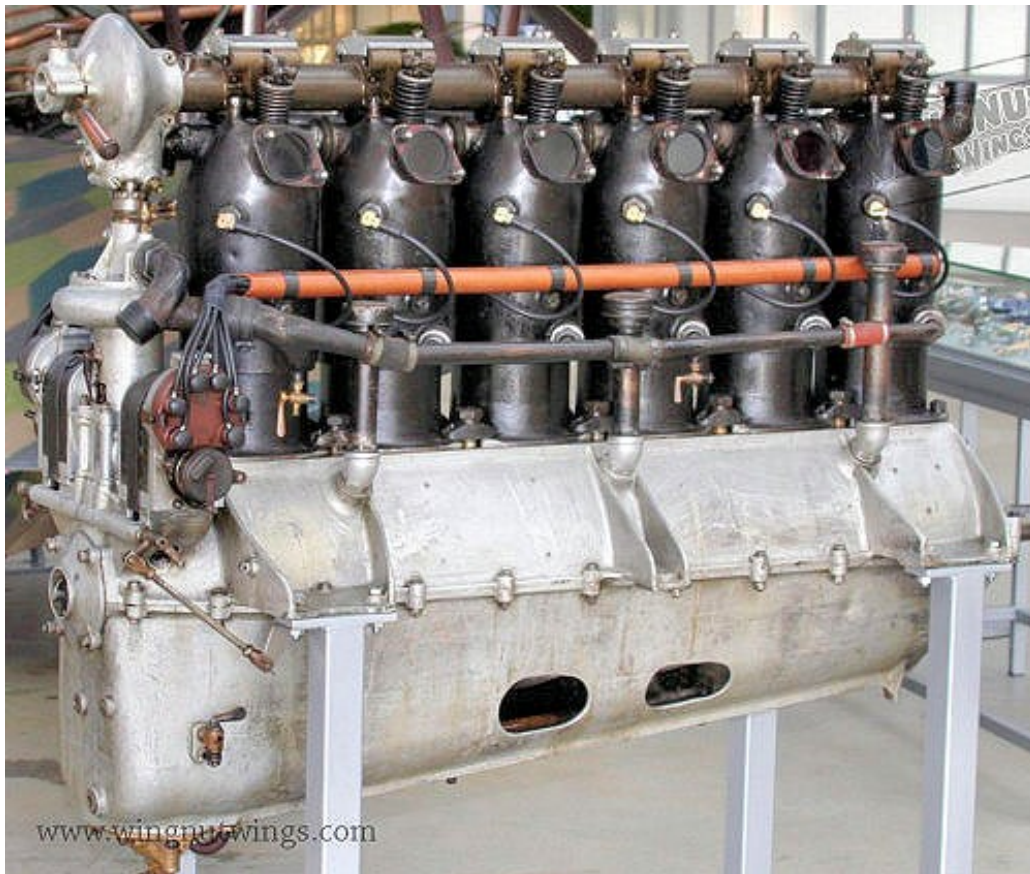
## PART 7 - ENGINE

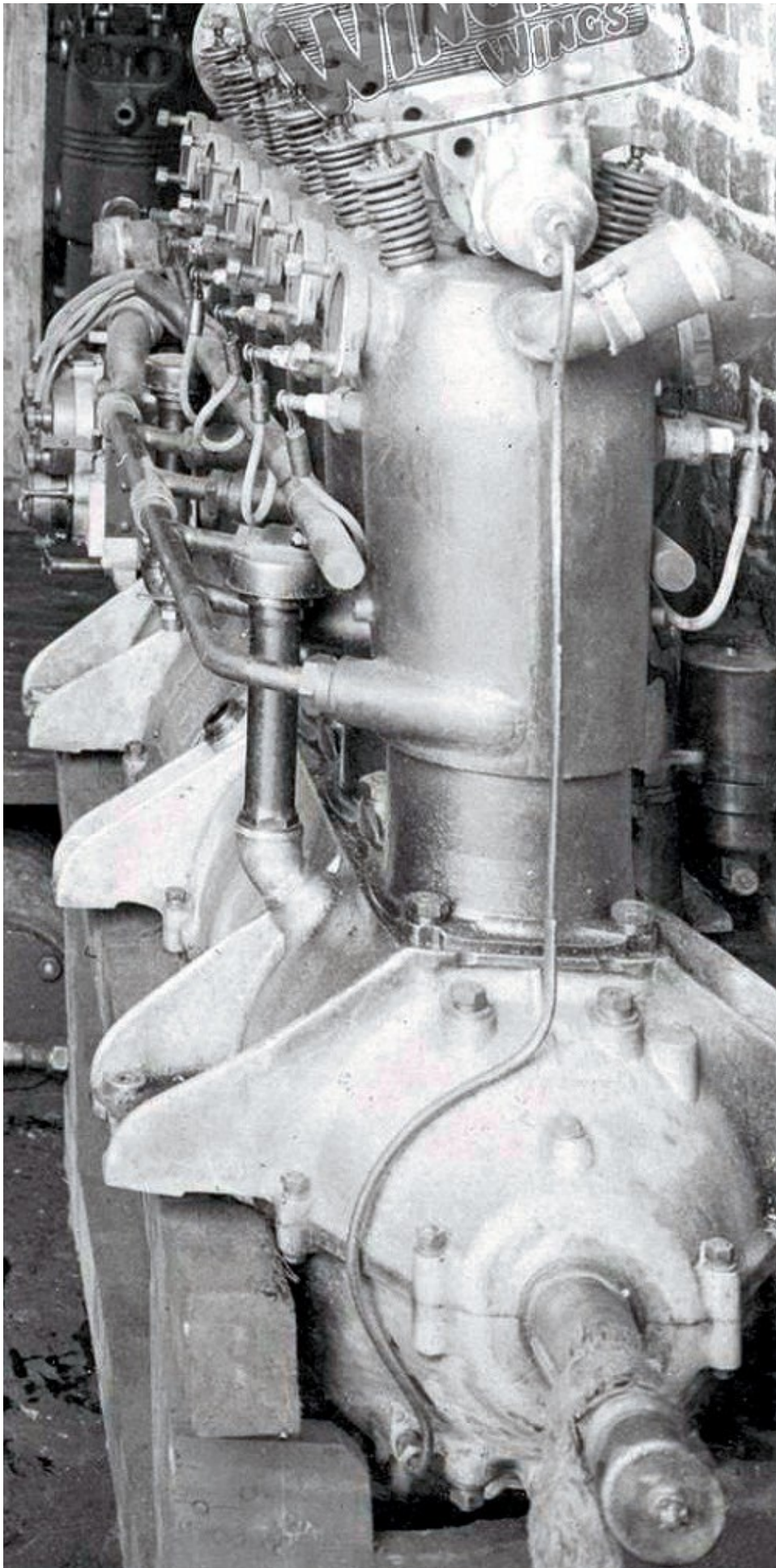
### NOTE:

*When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

*Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part.*

*'Wingnut Wings' models parts are made with very close tolerances and any primer or paint may stop parts locating fully together.*





## **Preparation:**

**NOTE:** *'Wingnut Wings' state that the engine fitted to this particular aircraft was the Daimler-Mercedes D.III (160hp) engine (page 6 of the kit instructions).*

Prepare the following parts:

**A** - 61

**E** - 2 to 12, 14 to 22

**F** - 5

## **Assembly:**

Cement the propeller shaft (A61) into the engine crank case (E10).

Cement the engine block (E14) onto the crank case assembly.

Cement the engine cylinder halves (E2, E16) together.

Cement the front cover (E7) onto the front of the engine block.

Cement the fuel float chambers (E22) into the intake manifold (E4).

Cement the two oil filler pipes (E17, E18) into the engine block.

Cement the flywheel (E8) onto the rear of the engine.

## **Painting:**

Airbrush all prepared parts and assemblies with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

**NOTE:** *Applying a gloss black base coat will give the subsequent metal coat more lustre.*

Airbrush the following parts with a 'Tamiya' Gloss Black (X1) or similar:

Engine crankcase, block and filler pipes assembly (A61, E10, E14, E17 and E18).

Coolant pipe (E3), Camshaft (E6), Magneto drive (E9), Magnetos (E19, E20),

Pre-heater pipe (E21), Decompression lever (E12), Air valve (E5) and Intake manifold assembly (E4, E22), Camshaft (E6).

Airbrush the following parts with a 'Alclad' Duraluminium (ALC102) or similar:

Engine crankcase, block and filler pipes assembly (A61, E10, E14, E17 and E18).

Magneto drive (E9), De-compression lever (E12), Air valve (E5)

Main housing of the intake manifold assembly (E4).

Airbrush the camshaft (E6) with a 'Alclad' Steel (ALC112) or similar.

Brush paint the following with 'Mr. Colour' Brass (219) or similar:

Crankcase filler caps (E17, E18)

Float chambers (E22) and discs on top of carburettor body (E4)

Bottom handwheel on decompression lever (E12)

Bottom faces of the magnetos (E19, E20).

Brush the following with 'Tamiya' Hull Red (XF9) or similar:

Handle of the decompression lever (E12)

Lead connection faces of the magnetos (E19, E20)

Exhaust ports on cylinder heads (E2).

Brush paint the shaft of the camshaft (E6) with 'Mr. Colour' Iron (212) or similar.

Brush paint the valve tappets of the camshaft (E6) with 'Tamiya' Bronze (X33) or similar.

Brush paint the valve springs on the cylinder heads (E11, E16) with 'Mr. Colour' Stainless Steel (213) or similar.

Brush paint the support bands for the float chambers (E22) with 'Mr. Colour' Copper (215) or similar.

Cover any overspray on the induction pipes of the intake manifold assembly (E4, E22) with 'Tamiya' Gloss Black (X1) or similar.

### **Enhancements:**

#### **Ignition lead support tubes:**

**NOTE:** *The kit supplied support tubes (E11, E15) are moulded solid, making attaching ignition leads difficult.*

Measure the distance between the round locating peg at one end of a support tube and that end of the tube.

Cut a length of 1.0mm diameter Brass tube, such as 'Albion Alloy's' MBT10 or similar.

At the round locating peg end of the support tube, cut away the half of the end of the tube.

Using thin CA adhesive, secure the Brass tube onto the cut end of the support tube. This should restore the support tube to its original length, but with a hollow end for inserting ignition leads.

Repeat the procedure to modify the other support tube.

Airbrush the two support tubes with a 'Tamiya' Gloss Black (X1) or similar.

#### **Spark plugs:**

Using a 0.7mm diameter drill, drill out the spark plug holes in both sides of each of the six engine cylinders.

Cut twelve short lengths of the 0.5mm diameter Brass tube, such as 'Albion Alloy's' MBT05 or similar.

Cut twelve lengths of 0.2mm diameter copper wire.

Anneal (soften) the wires by moving them across a flame, such as that from a cigarette lighter, until the colour darkens slightly.

Secure a wire into each tube, using thin CA adhesive.

Brush paint each tube with 'Tamiya' Deck Tan (XF55) or similar.

### **Assembly (continued):**

Cement the coolant tube (E3) over the two crankcase filler pipes and into its locating holes in the base of the right cylinder bank (E2).

Cement the modified ignition lead support tube (E11) into its locating holes in the right cylinder bank (E2).

Cement the modified ignition lead support tube (E15) into its locating holes in the left cylinder bank (E16).

Cement the cylinder bank assembly onto its locating pegs on the engine block (E14).

Cement the camshaft (E6) into its locating holes in the top of the cylinder bank.

**NOTE:** On the magneto drive housing (E9), cut away the location stub for the wing radiator pipe (F5). This enables it to be fitted after the engine side panel (D5) is fitted and later in the build.

Cement the magneto drive housing (E9) onto the rear of the engine and the rear locating peg of the camshaft.

Cement the decompression lever (E13) onto its locating recess in the top, rear of the magneto drive housing.

Cement the air valve (E5) onto the front of the camshaft.

### **Enhancements (continued):**

#### **Spark plug leads:**

Secure a tube into each pre-drilled hole in the cylinders, using thin CA adhesive.

Trim the length of each wire such that it can be looped over and then under its support tube.

### **Assembly (continued):**

Cement the carburettor assembly (E4, E22) into its locating recess in the crankcase and the end intake manifold pipes (E4) into their locating holes in the front and rear cylinders.

Cement the coolant pipe (E21) into its location hole at the top rear of the rear cylinder, with its front end on the top of the carburettor body. The pipe will need to be passed under the spark plug leads, which can be temporarily moved.

### **Decals:**

**NOTE:** Refer to Part 4 (Decals) of this build log for more information.

Remove decals 64 and 65 from the kit supplied decal sheet.

Apply decal 64 to the forward, right side of the engine crankcase.

Apply decal 65 to the forward, left side of the engine crankcase.

### **Enhancements (continued):**

#### **Magneto leads:**

Cut twelve lengths of 0.2mm diameter copper wire.

Anneal (soften) the wires by moving them across a flame, such as that from a cigarette lighter, until the colour darkens slightly.

Twist the ends of six wires together then secure them into the open tube on the rear end of one of the ignition lead support tubes, using thin CA adhesive.

Loop the ends of the wires down and onto each of the six connectors on the magneto on that side of the engine.

Secure the wires to the magneto connectors using thin CA adhesive.

Brush paint the magneto connections with 'Tamiya' Rubber Black (XF85) or similar.

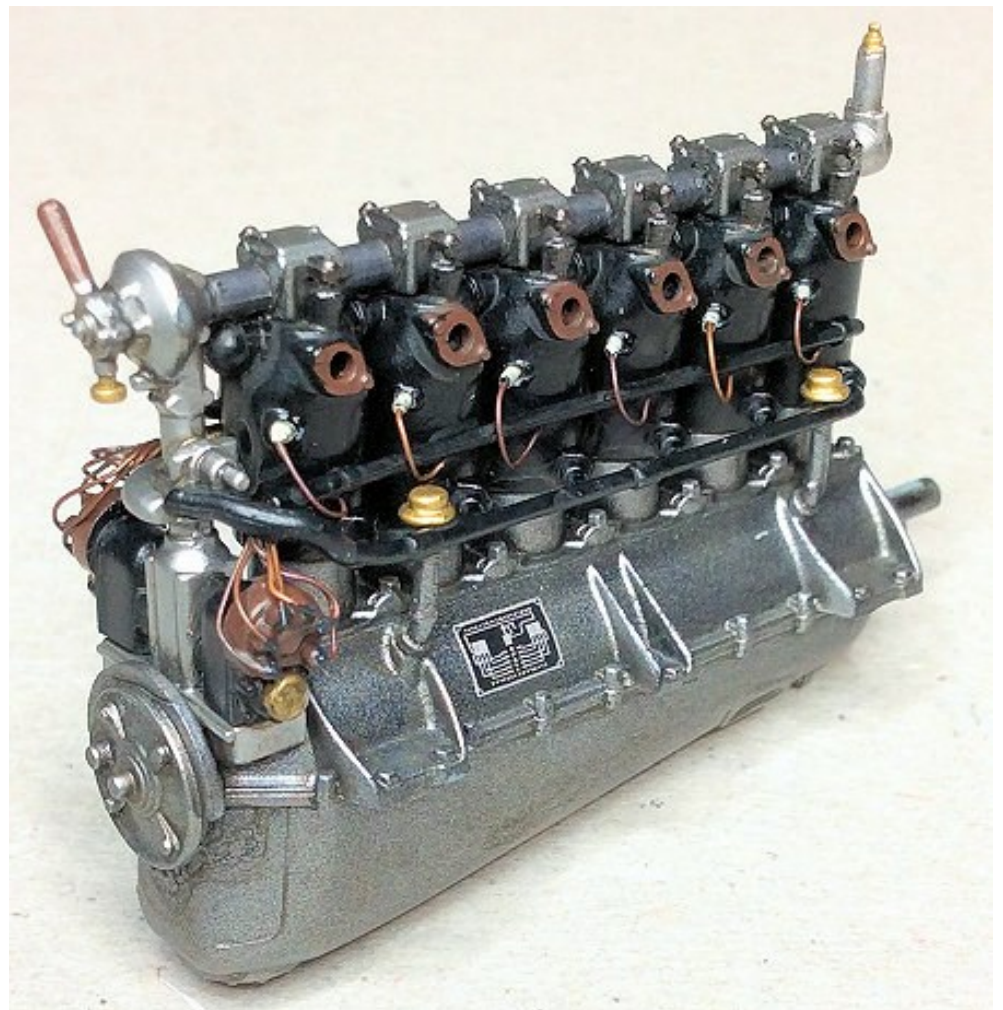
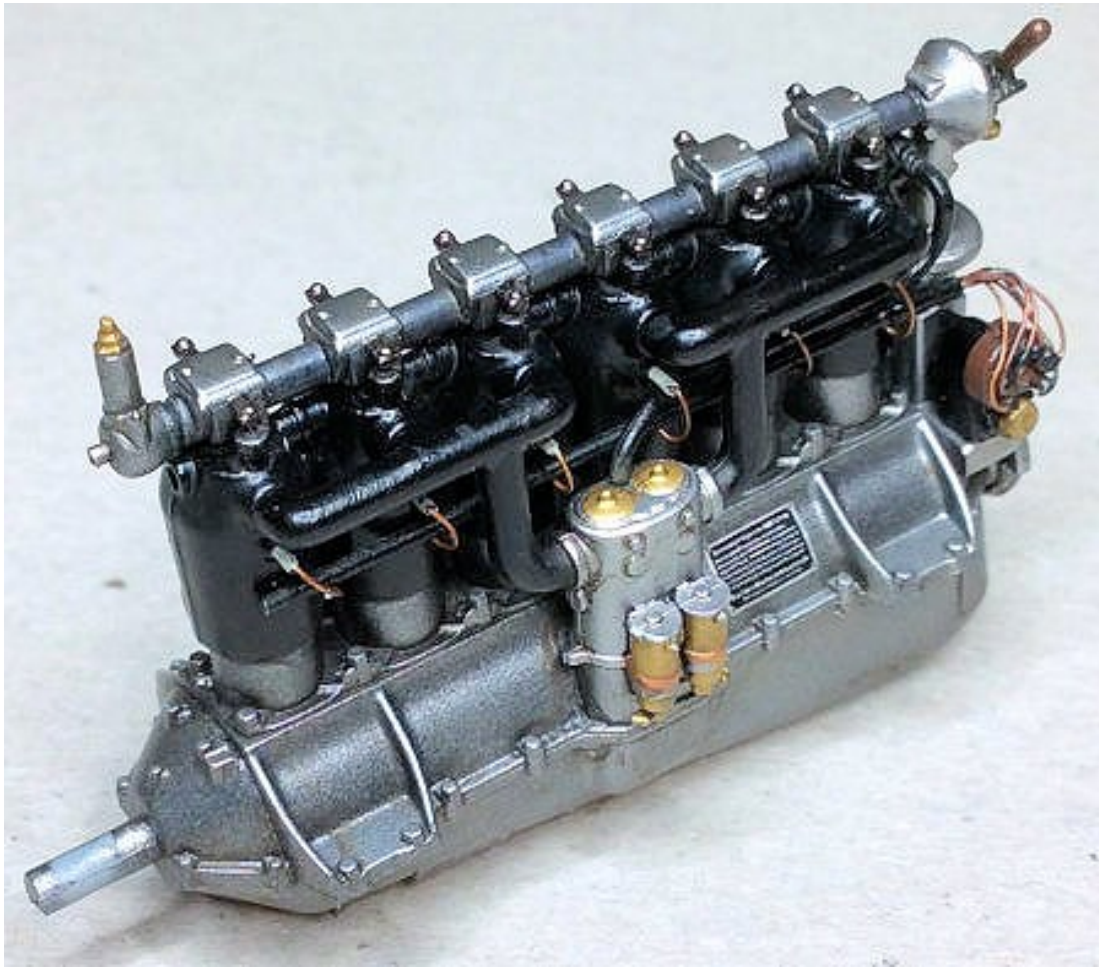
Repeat the procedure to add six wires to the opposite side of the engine.

### **Weathering:**

To provide a good base for weathering and to seal in applied decals, airbrush the parts with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

Refer to Part 3 (Weathering) of this build log for more information. I applied 'Flory Models' Dark Dirt fine clay wash over the model parts.





# PART 8

# PROPELLER

## PART 8 - PROPELLER

The kit supplied propellers represent types manufactured by either 'Integra', 'Axial' or 'Garuda'. However, I preferred to replace the kit supplied propeller with a 'ProperPlane' wood laminated 'Garuda' propeller.



### Spinner back plate:

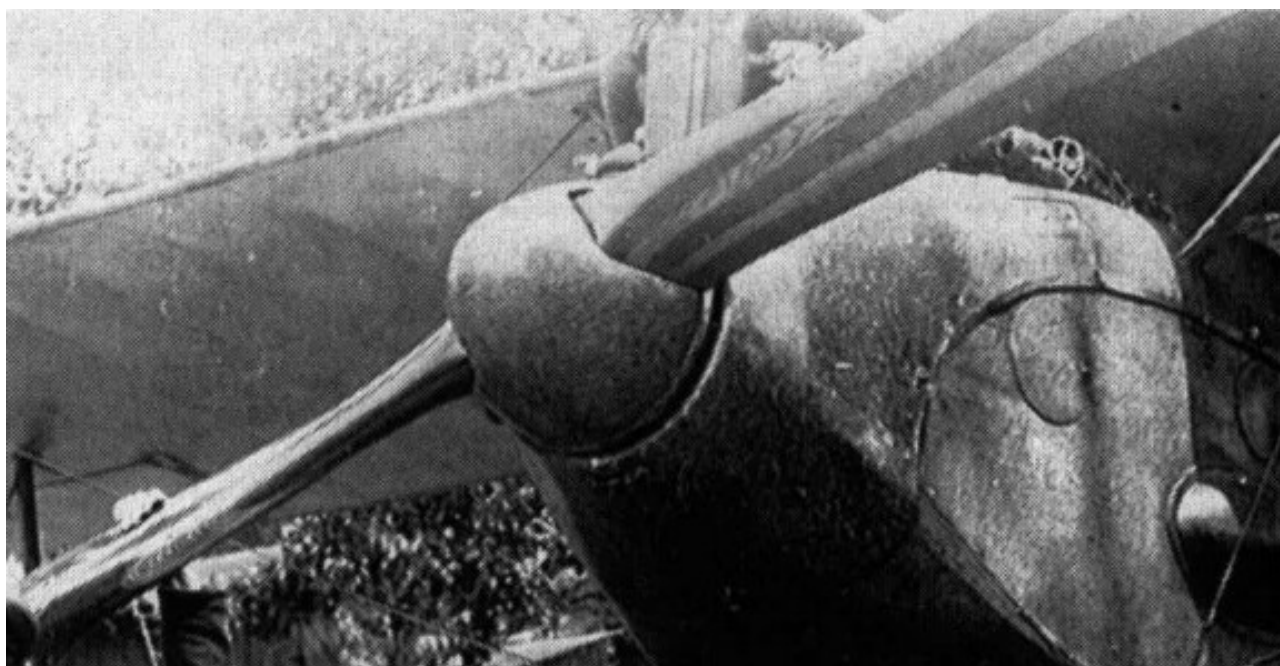
**NOTE:** *The kit supplied propellers have a location recess in the rear of the propeller hub. This recess is intended to be located onto a boss on the front face of the spinner back plate (A22). However, the 'Proper Plane' propeller does not have this recess and instead has a locating hole. Therefore, the locating boss on the spinner back plate should be removed to allow the propeller to fit inside the propeller spinner. Also, with the spinner fitted there is no requirement for the propeller front and rear plates, as they will not be visible.*

Cut away the raised locating boss from the front face of the propeller spinner back plate (A22).

File or scrape away any remains of the boss to leave the face of the spinner back plate flat.

**NOTE:** *The front and rear resin hub plates supplied with the 'Proper Plane' propeller will not be used as they will be covered by the propeller spinner and not seen.*

Temporarily fit the propeller spinner over the propeller, making sure the propeller blades are angled correctly.

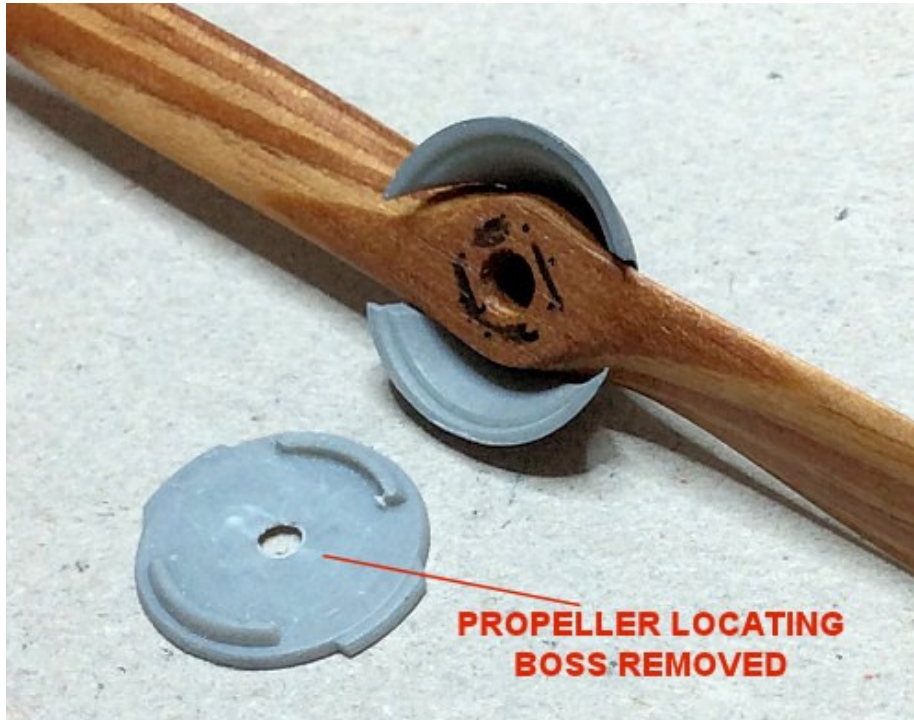


Locate the modified spinner back plate onto the spinner, making sure the shoulders on the back plate locate into the spinner openings for the propeller blades.

Check that the spinner and back plate fully locate into each other with the propeller fitted.

Separate the spinner, propeller and back plate.

Drill out the shaft hole in the back plate using a 2.0 mm diameter drill. This will allow the engine propeller shaft to align with the back plate and 'Proper Plane' propeller.



### **Decals:**

**NOTE:** Refer to page 14 of the kit instruction manual for positioning of the propeller decals. Decal 97 is not used as it will be covered by the propeller spinner and not seen.

Apply the 'Garuda' logo decals (96) onto the front face of the propeller blades.

### **Painting:**

Airbrush a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the propeller.



# PART 9

# WEAPONS

## PART 9 - WEAPONS

### NOTE:

*When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

*Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part.*

*'Wingnut Wings' models parts are made with very close tolerances and any primer or paint may stop parts locating fully together.*

### Spandau machine gun:

#### Preparation:

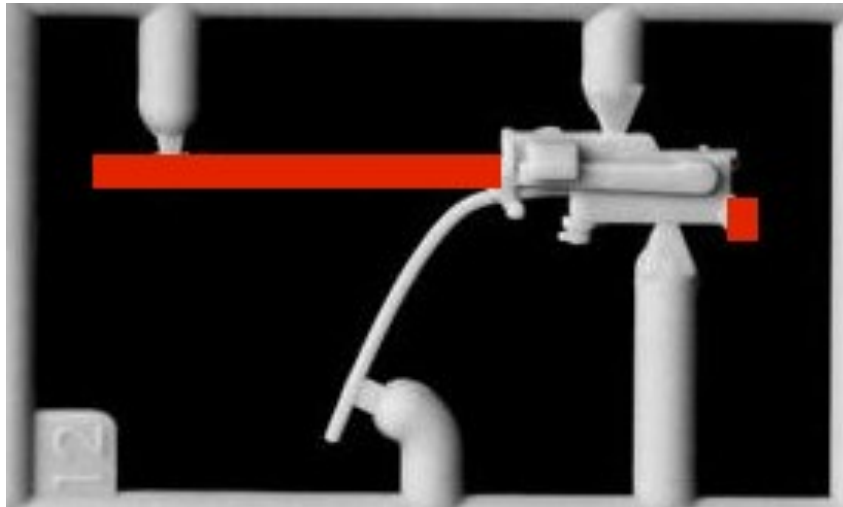
**NOTE:** Photo-etch parts 4 and 5 will not be required as they will be replaced with a 'Master' 1:32nd Spandau LMG 08 Brass barrel (AM-32-023).

Prepare parts F1 and 12.

#### Modification:

**NOTE:** *The following is to allow the 'Master' cooling jacket to fit against the front of the breech block. Also the locator block on the rear of the breech block is difficult to fit into its recess in the pilots panel. This block is not really needed as the weapon is fixed in position by the 'leg' on the ammunition feed chute (F1).*

Carefully cut away the barrel and area of the machine gun breech block shown in red.



#### Assembly:

**NOTE:** *Refer to the 'Master' instructions for positioning of parts. As the cooling jacket and end plates are very thin, I chose to use **thin CA adhesive**, rather than soldering, to assemble the 'Master' Brass parts.*

Secure the Brass muzzle into the end of the Brass barrel.

Hold the front end plate in position on the front (holes around edge not slots) of cooling jacket, making sure the edges are aligned.

Secure the front end plate in position using thin CA adhesive.

Pass the barrel through the barrel hole in the front end plate for the cooling jacket.

Pass the barrel through the cooling jacket.

Locate the rear end plate onto the rear of the barrel.

Locate the rear end plate in position on the rear (slots around the edge) of cooling jacket, making sure the edges and the barrel are aligned.

Secure the rear end plate and barrel in position using thin CA adhesive.

Point mark the face of the breech block at the bottom centre and just above the bottom edge.

Drill a hole of 0.9mm diameter into the breech block. Make sure the hole is drilled parallel to the sides and top of the breech block.

Check fit the 'Master' assembly into the breech block, making sure it locates fully against and is aligned with the breech block.

Temporarily fit the ammunition feed chute (F1) and the barrel of the 'Master' assembly into the breech block.

If necessary, trim the length of the locator of the feed chute such that it can be located without obstructing the barrel of the 'Master' assembly.

Using thin CA adhesive, secure the 'Master' assembly into the breech block.

Using thin CA adhesive, secure the front gun sight onto the front, top of the cooling jacket.

Cement the ammunition feed chute (F1) into the breech block.



Refer to Part 11 (Phase One Construction) - Test fit the weapon assembly into the fuselage.

#### Painting:

**NOTE:** *Only the machine gun is painted in this chapter. The other associated parts will be painted and assembled later in this build log.*

Airbrush the machine gun assembly with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

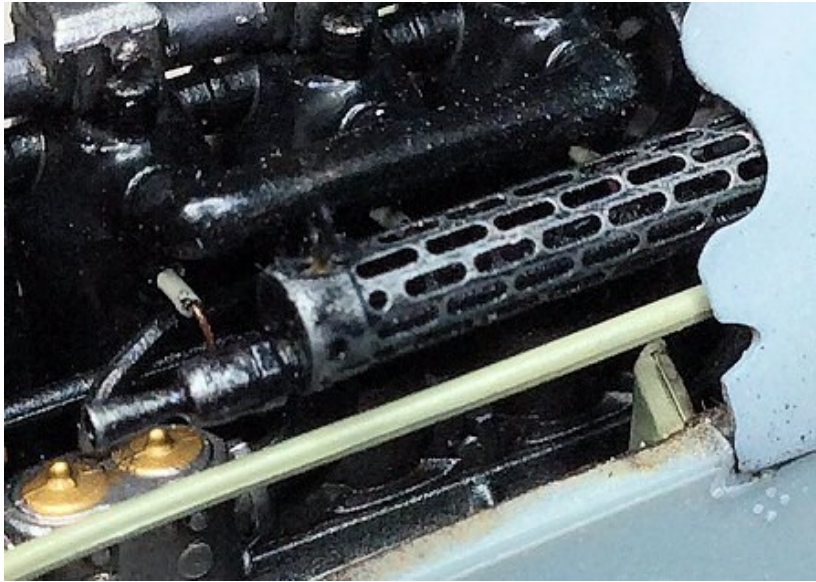
Airbrush the machine gun assembly with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the machine guns with 'Alclad' Gunmetal (ALC120) or similar.

**NOTE:** *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Represent a worn paint effect by dry brushing the machine gun with 'Mr. Colour' Super Iron 2 (SM203) or similar.

**NOTE:** *Painting further details on the breech block of the machine gun is not carried out, as those details will not be seen under the fuselage decking panel.*



### **Parabellum machine gun:**

#### **Preparation:**

**NOTE:** Photo-etch parts 1 and 2 will not be required as they will be replaced with the 'Master' 1:32nd Parabellum LMG 14 Brass barrels (AM-32-024).

Prepare parts **A**10, 14, 15, 66, 74 and 80.

#### **Modification:**

**NOTE:** The following is to *allow the 'Master' cooling jacket to fit against the front of the breech block.*

Carefully cut away the barrel from the machine gun breech block shown in red.



#### **Assembly:**

**NOTE:** Refer to the 'Master' instruction for positioning of parts. As the cooling jacket and end plate are very thin, I chose to use **thin CA adhesive**, rather than soldering, to assemble the 'Master' Brass parts.

Hold the front end plate in position on the front of cooling jacket, making sure the edges are aligned.

Secure the front end plate in position using thin CA adhesive.

Pass the barrel muzzle end first (smaller diameter) through the rear of the cooling jacket and through the barrel hole in the front end plate.

Locate the rear end plate onto the rear of the barrel.

Locate the rear end plate in position on the rear of cooling jacket, making sure the edges and the barrel are aligned.

Secure the rear end plate and barrel in position using thin CA adhesive.



Point mark the face of the breech block at the bottom centre and just above the bottom edge.

Drill a hole of 0.9mm diameter into the breech block. Make sure the hole is drilled parallel to the sides and top of the breech block.

Check fit the 'Master' assembly into the breech block, making sure it locates fully against and is aligned with the breech block.

Cement the two halves (A14, A15) of the ammunition cannister together.

Cement the ammunition cannister onto the recess on the underside of the breech block.

Locate the ammunition belt (A10) over the cannister and cent each end to the breech block.

Using thin CA adhesive, secure the 'Master' assembly into the breech block.

Using thin CA adhesive, secure the front gun sight onto the front, top of the cooling jacket.

Locate the gun support (A74) into the gun mounting (A80), for fitting later in this build.



#### Painting:

**NOTE:** *Only the machine gun is painted in this chapter. The other associated parts will be painted and assembled later in this build log.*

Airbrush the machine gun assembly with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the machine gun assembly with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the machine guns with 'Alclad' Gunmetal (ALC120) or similar.

**NOTE:** *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Represent a worn paint effect by dry brushing the machine gun with 'Mr. Colour' Super Iron 2 (SM203) or similar.

Brush paint the ammunition belt with 'Tamiya' Buff (XF57) or similar.

Brush paint the ammunition cannisters with 'Mr. Colour' Brass (219) or similar.

Brush paint the ammunition bullet heads with 'Mr. Colour' Copper (215) or similar.

Brush paint the hand grip and shoulder stock as follows:

Brush paint with 'Tamiya' Dark Yellow (XF60) or similar.

Refer to Part 2 (Wood Effects) of the build log for more information. Apply wood effects.  
I used 'Windsor & Newton' Griffin Alkyd Vandyke Brown.



**PART 10**  
**INTERNAL**  
**PRE-RIGGING**

## PART 10 - INTERNAL PRE-RIGGING

### Pre-rigging:

**NOTE:** Refer to Part 6 (Rigging) of this build log for more information.

At this stage of the build it's best to prepare as much of the internal rigging as possible, as some access will be restricted when the model is assembled.

### Internal:

It seems this particular aircraft cockpit had no bracing wires fitted. Also, the only flight control cables from the cockpit are those for the elevator and rudder. These cables, if fitted to the model, would be virtually impossible to see, being hidden both by the pilots seat and the fuel tank and also being routed behind the wood side panels in the observers cockpit.

Therefore, I chose **not to fit** either the **elevator or the rudder** control cables in the cockpit area.

**PART 11**  
**PHASE 1**  
**CONSTRUCTION**

## **PART 11 - PHASE 1 CONSTRUCTION**

### **NOTE:**

*When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

*Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part.*

*'Wingnut Wings' models parts are made with very close tolerances and any primer or paint may stop parts locating fully together.*

### **Preparation:**

Anneal (soften) the photo-etch parts (P6 to P9) by moving them across a flame, such as that from a cigarette lighter, until the colour darkens slightly.

Cut away the locating stub (farthest from the panel hinge) on the underside of the filter access panel (A7).

Refer to page 8 of the kit instruction manual - using a 0.5mm diameter drill, chain drill then scrape a slot in both fuselage halves at the rear underside (for the lower elevator control cables).

Refer to page 8 of the kit instruction manual - scrape away the screw heads for the late version aircraft.

Cut away the starter magneto from the forward, top of the cockpit left side frame (A33).

**NOTE:** *Refer to page 3 of the kit instructions. The cockpit floor (D15) needs to have a clearance hole for the filter on the lower, rear of the engine crank case. Take care when opening up the required clearance hole as the panel is very thinly moulded and will tear and be damaged if the drill size is too large or too much pressure is applied. Alternatively, as the filter will not be seen once the fuselage is closed up, the bottom of the engine filter can be cut away to clear the cockpit floor.*

Open up the rear clearance hole in the cockpit floor (D15) to 4.5mm diameter for the Daimler-Mercedes D.III (160hp) engine being fitted.

### **Assembly:**

Cement the wireless Type D (A36) to its support frame (A51).

Cement the pilots seatback (A54) onto the seat base (A52).

**NOTE:** *When the frame is fitted into the engine bearers, the frame is angled rearwards. Also there should be a space between the right, front of the frame and the right engine bearer.*

Cement the fuselage frame (A42) into the engine bearers (A53).

Cement the fuselage frame/engine bearers assembly into the front of the cockpit floor (D15).

Cement the fuel drain cover (A76) onto the fuselage underside panel (D13).

Cement the magazine/empty belt container (F7, F8) together.

Cement the generator blanking plate (A44) into its recess in the fuselage left side (D17).

Cement the rudder bar support (A48) and elevator control (A8) together.

Cement the control column (A59) and elevator bar (A38) together.

## **Painting:**

Airbrush all prepared parts and assemblies with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

**NOTE:** *The rear area of the fuselage halves does not need masking off or painting, as that area will not be seen on the finished model. Refer to page 5 of the kit instructions for information on painting the various cockpit parts.*

Mask off the forward area of the fuselage halves, the forward section of the cockpit floor and the side panels of the cockpit side frames.

Airbrush 'Tamiya' Grey-Green IJN (XF76) or similar over the following:

- Unmasked internal surfaces of the fuselage halves
- Unmasked cockpit floor area and engine bearers
- Left and right cockpit side frames (A33, A46)
- Instrument panel (F14)
- Cross frame (A58)
- Gun ring support (A87)
- Internal surface of under fuselage panel (D13)
- Radiator pipe (F5).

Airbrush 'Tamiya' RLM Grey (XF22) or similar over the following:

- Wireless set (A36)
- Amplifier (A35)
- Fuel tank D14) and engine oil tank (D3).

Mask off the painted areas of the fuselage halves and the cockpit floor.

Airbrush 'Tamiya' Dark Yellow (XF60) or similar over the following:

- Unmasked forward surfaces of the fuselage halves
- Unmasked areas of the cockpit floor
- Top panel and curved frame of the rear bulkhead (D2)
- Observers seat (A47)
- Pilots seat (A54)
- Wireless aerial reel (A40).

Brush paint 'Tamiya' Dark Yellow (XF60) or similar over the lower side panels of the left and right cockpit side frames. Also the wireless aerial hand reel on the left cockpit side panel.

Brush paint 'Tamiya' Buff (XF57) or similar over:

- Front face of the rear bulkhead (D2).
- Top longerons of the cockpit side frames (A33, A46).

Brush paint 'AK Interactive' Brown Leather (AK3031) with British Uniform (AK3081) highlights over:

- Top rail of the Cross member (A58)
- Pilots seat cushion (A49)
- Observers seat cushion (A41)
- Body of wireless tube (A24).

Airbrush the control column and rudder bar assemblies with 'Tamiya' Rubber Black (XF85) or similar.

Brush paint the following with 'Tamiya' Rubber Black (XF85) or similar:

Compass (A60)

Starter magneto and instruments on the pilots panel (F14)

Observers seat support (A85)

Pilots seat supports (A54)

Engine control lever (A31)

Rubber joint on radiator pipe (F5). Once dry, use a sharp pencil to draw over the raised band clamps around each end of the rubber joint.

Instruments, hinges and conduit junction box on Wireless set (A36)

Top and pipe on wireless tube (A24)

Instruments, lever and control box on cockpit right side frame (A46)

Instrument and conduit junction boxes on cockpit left side frame (A33).

Brush paint the following with 'Mr. Colour' Brass (219) or similar:

Fuel tank pressure pump (A84)

Caps on fuel tank (D14)

Starter switch on cockpit left side frame (A33)

Filler cap on engine oil tank (D3).

Brush paint the following with 'Mr. Colour' Stainless Steel (213) or similar:

Conduit from the amplifier mounting along the cockpit left side frame (A33)

Control lever and conduit on the cockpit right side frame (A33) from the compass along and behind the wireless aerial panel

Grease pump housing on pilots panel (F14)

Handle stem and clamping strap on fuel tank pressure pump (A84)

Plates and conduit on bottom of amplifier (A35)

Engine control lever (A31)

Magazine/empty belt container (F7, F8)

Trigger paddles on top of control column (A59)

Instruments, plate and conduits on wireless (A36)

Pipe and straps on fuel tank (D14).

Brush paint the following with 'Tamiya' Hull Red (XF9) or similar:

Hand grips on control column (A59)

Hand grip on engine control lever (A31)

Hand grip on wireless aerial reel (A40)

Handle of fuel tank pressure pump (A84).

Refer to Part 2 (Wood Effects) of the build log for more information.

Apply wood effects over the following previously painted 'Tamiya' Dark Yellow (XF60) parts - I used 'Windsor & Newton' Griffin Alkyd Raw Sienna paint:

Lower side panel on the cockpit left right side frame (A33).

The wireless aerial hand reel and panel on the cockpit left side panel (A46).



Forward section of the cockpit floor (D15)  
Top shelf and curved rib on the rear bulkhead (D2)  
Pilots seat surround (A54)  
Observers seat surround (A47).

Refer to Part 2 (Wood Effects) of the build log for more information.

Apply wood effects over the forward section of the fuselage halves, previously painted with 'Tamiya' Dark Yellow (XF60). I used 'Windsor & Newton' Griffin Alkyd Vandyke Brown.

### **Assembly (continued):**

Cement the rudder bar (A37) into the support assembly (A8, A48).

Cement the rudder bar assembly into its locations on the cockpit floor.

Cement the fuel tank (D14) into its locating slots on the cockpit floor.

Cement the pilots seat cushion (A49) onto the seat (A52, A54).

Cement the pilots seat assembly into its locating recesses on the fuel tank.

Cement the wireless tube (A24) into its locating recess in the cockpit floor.

Cement the wireless set (A36) onto the support frame (A51).

Cement the amplifier (A35) into its locations on the cockpit left side frame (A33).

Cement the engine control lever (A31) into its location on the cockpit left side frame (A33).

Cement the wireless hand reel (A40) into its location on the cockpit right side frame (A46).

Cement the compass (A60) into its location on the cockpit right side frame (A46).

Cement the observers seat cushion (A41) onto the seat (A47).

Cement the seat support frame (A85) onto the underside of the observers seat (A47).

Cement the observers seat assembly into its side slots in the cockpit floor.

Cement the hand pressure pump (A84) into its location on the pilots panel (F14).

### **Seat belts:**

**NOTE:** *The two sets of seat belts were annealed (softened) earlier in the build. The belts with the slotted catch ends are fitted to the right side of the seats.*

Carefully bend the seat belts for the observers sat over the seat edges and into the desired shape. Attach the anchored end of the belts to the forward seat support struts.

Remove the shaped seat belts without altering their shape.

Carefully bend the seat belts for the pilots sat over the seat edges and into the desired shape. Attach the anchored end of the belts to the sides of the fuel tank.

Remove the shaped seat belts without altering their shape.

Airbrush the seat belts with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the seat belts with a 'Tamiya' Desert Yellow (XF59) or similar.

Brush paint the metal fittings of the seat belts with 'Mr. Colour' Stainless Steel' (213) or similar.

Using thin CA adhesive, secure the seat belts in position on their seats.

## **Decals:**

### **NOTE:**

*Refer to Part 4 (Decals) of this build log for more information.*

*The decals required from the kit supplied sheet are as follows:*

*Wireless set - G6a, 6b, 7 to 11*

*Amplifier set - G12, 12a*

*Cockpit right side frame - 71, 73, 76, 77, 78*

*Cockpit left side frame - 72, 75*

*Pilots panel - 74, 80 to 83*

*Left fuselage half - 53*

*Refer to pages 3, 4 and 5 of the kit instructions for the positions of the various decals.*

Cut the required decals from the kit supplied sheet.

Brush a clear gloss coat, such as 'Tamiya' Clear Gloss (X22) or similar, over the areas that will require decals.

Apply the relevant decals to their correct locations.

## **Weathering:**

To provide a good base for weathering and to seal in applied decals, airbrush the parts with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

Refer to Part 3 (Weathering) of this build log for more information. I applied 'Flory Models' Dark Dirt fine clay wash over the model parts.

## **Assembly (continued):**

To represent the switch levers and grease pump handle on the pilots panel:

Bend to 90 degrees three short lengths of 0.3mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST03 or similar.

Drill through the pre-moulded holes in the centre of the pump and two dials using a drill of 0.4mm diameter.

Secure the three tubes into the drilled holes, using thin CA adhesive.

Cement the rear bulkhead assembly into its locating slot at the rear of the cockpit floor.

Cement the cockpit right side frame onto its locators on the right side of the cockpit floor and at the rear bulkhead.

Cement the cockpit left side frame onto its locators on the right side of the cockpit floor and at the rear bulkhead.

Cement the gun ring rear support frame across the cockpit sides and over its end locators.

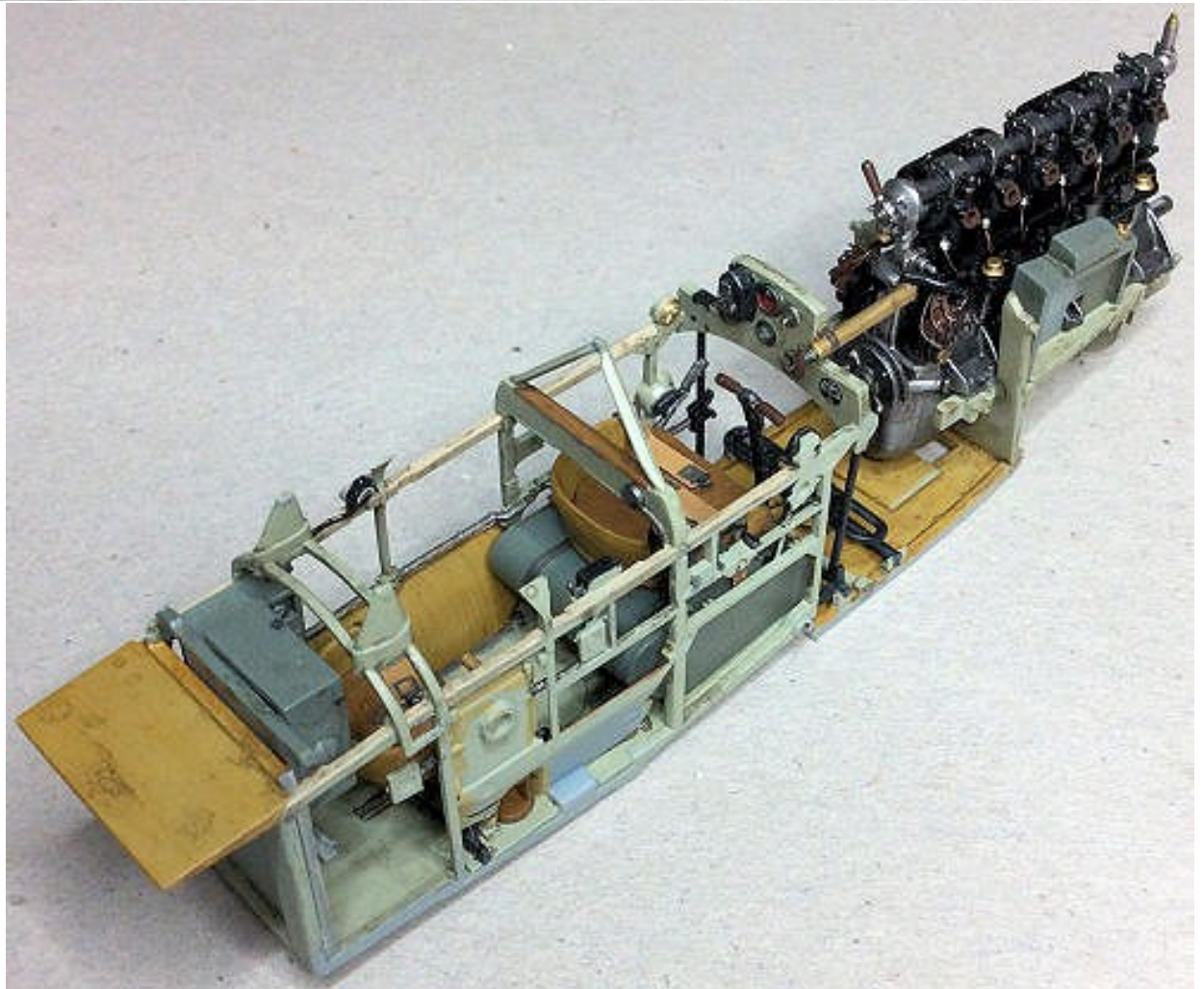
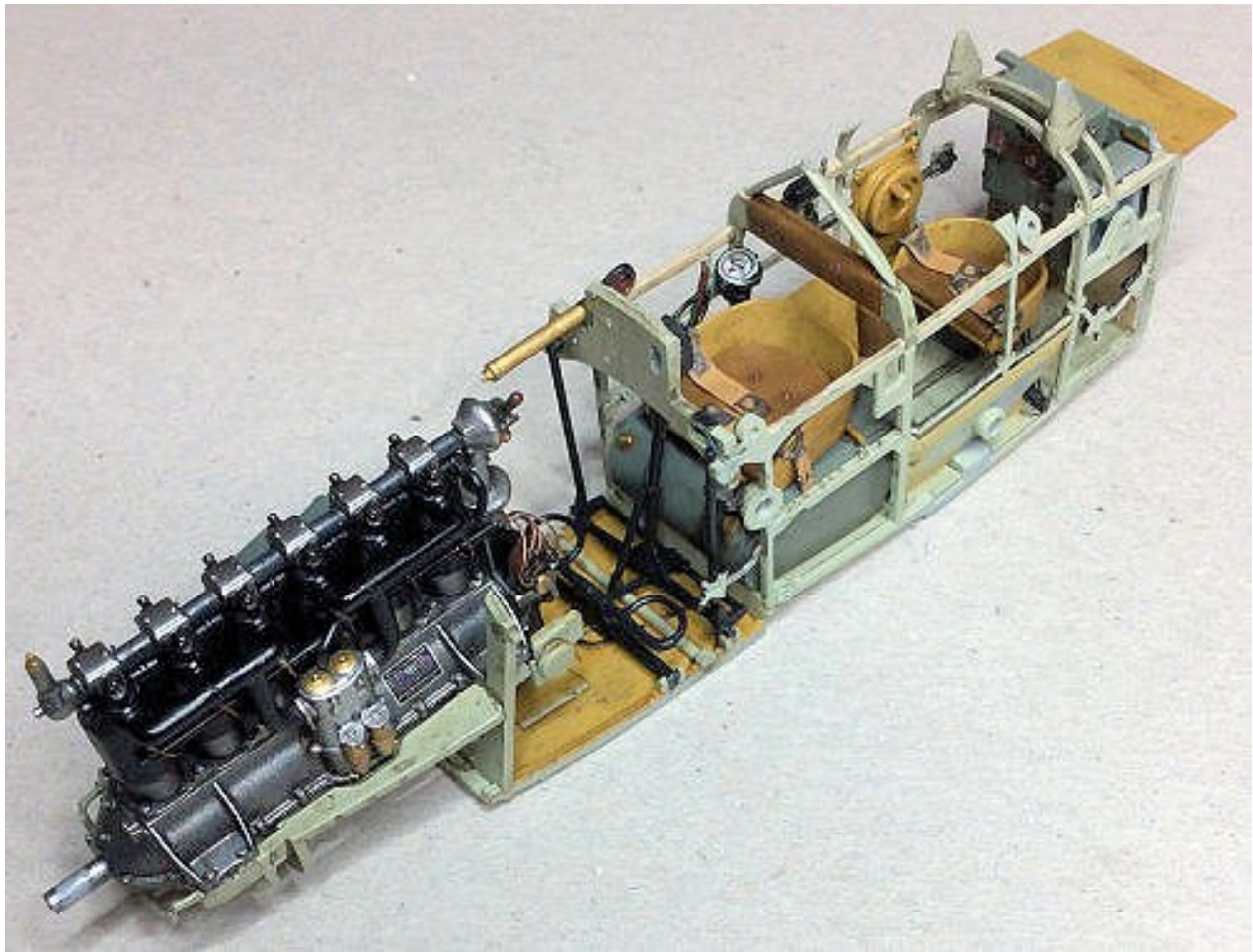
Cement the gun ring front support frame across the cockpit sides and into its location slots.

Cement the pilots instrument panel across the cockpit sides and into its location slots.

Cement the ammunition magazine onto its locator and hole on the fuselage right half.

Cement the engine assembly between and onto its four locations on the engine bearers.

Cement the engine oil tank into its location recesses in the right engine bearer.



**NOTE:** When fitting the cockpit/engine assembly into either fuselage half, the bottom of the fuselage half needs to be temporarily deflected down to allow the assembly to be fitted with the protruding rear gun mount passing through its opening in the top of the fuselage half.

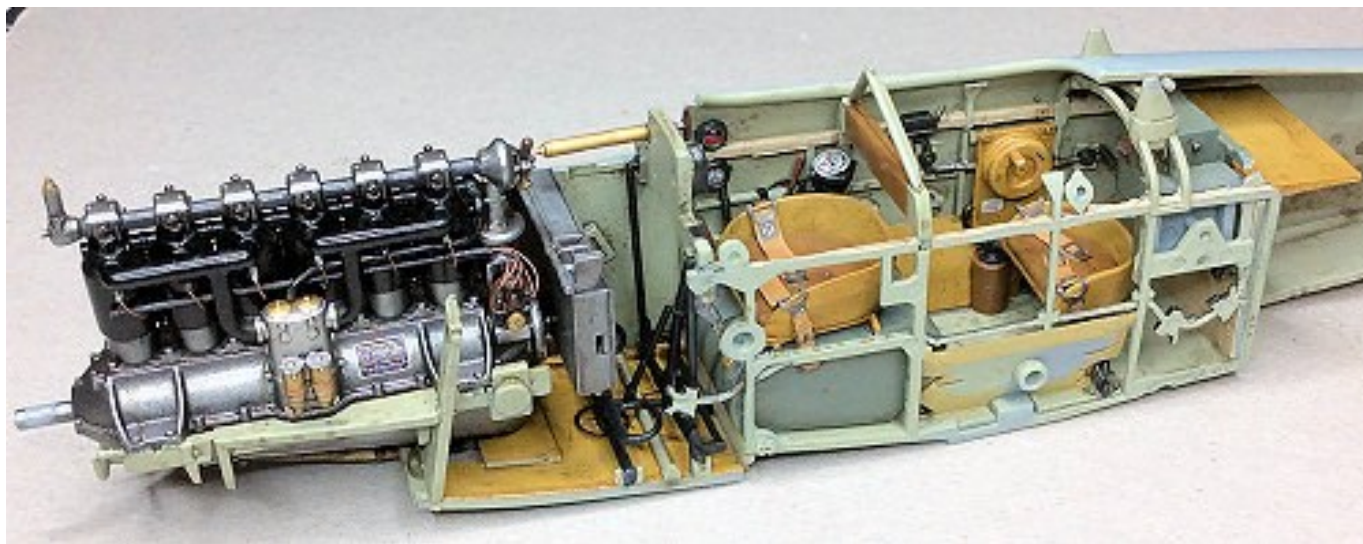
Test fit the cockpit/engine assembly into the fuselage right half, making sure that it:

Fully locates against the fuselage.

The bottom, front locating peg and the rear locating cylinder locate fully into their holes in the fuselage right half.

The locating peg at the top of the engine bearer rear frame locates fully into its locator hole in the fuselage right half.

The front of the engine bearer locates fully into its recess in the fuselage right half.



Test fit the fuselage left half onto the right half with fitted cockpit/engine assembly.

Make sure the two fuselage halves close together fully without any undue force required.

**NOTE:** I found that the protruding detail on the rear of the flywheel of the engine contacted the front face of the ammunition magazine, stopping its left locating slot aligning with its locator on the left fuselage. As the rear of the flywheel will not be visible, I filed off the raised detail to allow correct alignment.

Make sure all fuselage joint seams are closed with no undue gaps.

The bottom, front locating peg and the rear locating cylinder locate fully into their holes in the fuselage left half.

The locating peg at the top of the engine bearer rear frame locates fully into its locator hole in the fuselage left half.

The front of the engine bearer locates fully into its recess in the fuselage left half.

Carefully separate the fuselage halves and remove the cockpit/engine assembly.

Apply the cement to:

The side frame locating holes for the bottom, front locating peg and rear locating cylinder in the fuselage right half.

The locating hole in the fuselage right half for the peg at the top of the engine bearer rear frame.

The locating recess in the fuselage right half for the front of the engine bearer.

Locate the cockpit/engine assembly into the right fuselage half, making sure it fully locates onto the cement applied locations.

Apply the cement to:

The side frame locating holes for the bottom, front locating peg and rear locating cylinder in the fuselage left half.

The locating hole in the fuselage left half for the peg at the top of the engine bearer rear frame.

The locating recess in the fuselage left half for the front of the engine bearer.

**NOTE:**

*When cementing the fuselage halves together, I used 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts.*

Apply cement along the mating edges of the fuselage right half.

Locate the fuselage left half onto the right half with fitted cockpit/engine assembly. If necessary, clamp the fuselage halves together until the cement has fully set.

Cement along the bottom of the cockpit side frames at the fuselage halves.

Cement across the underside of the fuselage halves at the cockpit floor.

Cement the underside panel (D13) into the underside of the fuselage.

Cement the water pump hatch (A7) in position on the underside of the fuselage.

Test fit the prepared pilots 'Spandau' machine gun (Part 9 of this build log) into the fuselage by inserting the 'leg' of the ammunition feed chute into its location recess in the ammunition magazine. Make sure the weapon assembly is parallel to the fuselage when viewed from above and from the side.



**NOTE:** *During the following step, I found that the breech block of the machine gun and inside of the decking panel (F6) need to have material removed to allow the panel to fully locate on the fuselage without being obstructed by contact with the machine gun.*

Temporarily fit the two fuselage decking panels (F6, F9) together and in position on the fuselage and over the machine gun. Make sure the panels fully locate against each other and can be fitted over the machine gun.

Holding the panels in position, cement along the joint between the two panels.

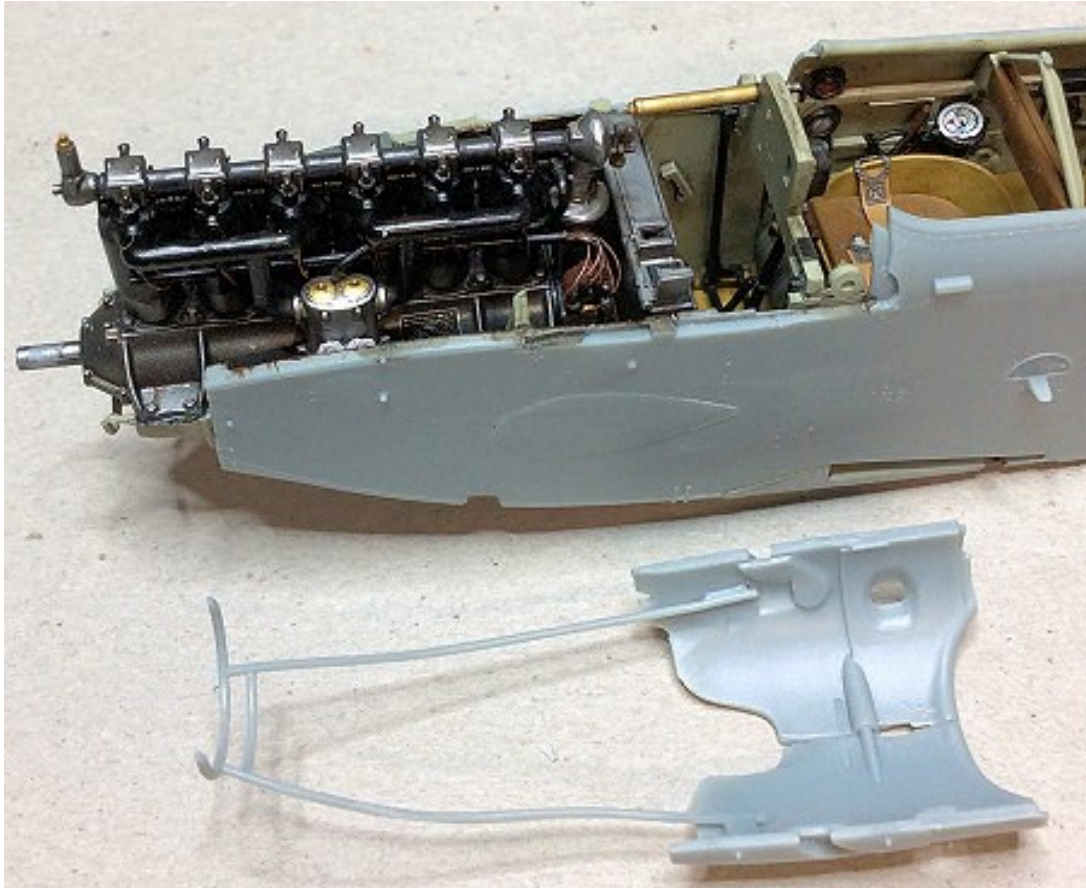
Remove the joined panels from the fuselage.

Leave the machine gun fitted in the fuselage.

Refer to page 10 of the instruction manual - drill two rigging holes of 0.5mm diameter through the fuselage decking panel assembly.

Cement the engine panel support frame (A83) into its locating recesses on the underside of the decking panel assembly.

Test fit the decking panel assembly onto the fuselage, making sure the panels fully locate and the support frame aligns with the bottom frame on the lower, front of the fuselage.



Cement the two fuselage front panels (D5, F13) together.

With the decking panel assembly over the machine gun, test fit the two fuselage front panels (D5, F13) in position, making sure they fully locate with each other and the fuselage/decking panels.

Hold all of the panels in position using masking tape.

Prepare photo-etch flash guard panel (P3) then bend the top edge (not holed edge) slightly.

Test fit the flash guard panel between the inner edge of fuselage front panel F13 (aligned to the pre-moulded flash guard panel) and the engine intake manifolds and front of the cooling jacket of the machine gun.

Remove the flash guard panel, the two front panels, the decking panel assembly and the machine gun.

Remove the masking tape from the panels.

Sand across all of the joint seam on the fuselage, decking panels assembly and the fuselage front panels assembly.

Check the seams and joints for any gaps or dips in the surfaces by the joints. If necessary, fill using 'Mr. Surfacer' 500 or 1000. Once cured, re-sand to achieve a smooth joint seam.

### **Painting (continued):**

Airbrush a grey primer, such as 'AK Interactive' Grey (AK758) or similar over the underside surfaces of the fuselage decking and fuselage front panel assemblies and both sides of the photo-etch flash guard panel.

Airbrush 'Tamiya' Rubber Black (XF85) or similar over both sides of the photo-etch flash guard.

Airbrush a gloss black, such as 'Tamiya' Gloss Black (X1) or similar over the underside surfaces of the fuselage decking and fuselage front panel assemblies.

Airbrush 'Alclad' Duraluminium (ALC102) or similar over the underside surfaces of the fuselage decking and fuselage front panel assemblies.

Brush paint the panel support frame on the fuselage decking with 'Tamiya' Grey-Green IJN (XF76) or similar.

Brush paint the Tachometer/Manometer (A9) with 'Mr. Colour' Stainless Steel or similar.

### **Assembly (continued):**

**NOTE:** *During the following steps, make sure the assemblies fully locate with no gaps at the adjacent panels and the fuselage.*

Cement the pilots machine gun into its locator slot in the ammunition magazine.

**NOTE:** *The engine to radiator pipe (F5) and the two forward cabane struts (A79, A81) are detailed to be fitted before the fuselage decking and front panels are fitted. However, this leaves them exposed throughout the remainder of the build with the possibility of them being broken or bent. Therefore I chose to fit those parts later in this build and after the panels are fitted.*

Cement the fuselage decking panel in position on the fuselage, including the front of the panel support frame onto the lower support frame at the fuselage front.

Cement the fuselage front panels assembly in position on the fuselage.

Using thin CA adhesive, secure the bent top edge of the photo-etch flash guard panel over the intake manifolds and aligned to the pre-moulded base plate on the fuselage port (left) front panel (F13).

Check the seams and joints for any gaps. If necessary, fill using 'Mr. Surfacer' 500 or 1000. Once cured, re-sand to achieve a smooth joint seam.

### **Painting (continued):**

Mask off the engine bay area and the open cockpit using kitchen 'Kling film' food wrap and 'UHU' White Tack as necessary. Also fill the lower wing locating slots and any openings in the fuselage with pieces of foam.

**NOTE:** *The exterior decals for the fuselage are from the 'Aviatic' Halberstadt Cl.II 5 colour fuselage stipple surfaces (ATT32209). These are printed on 'clear' carrier film, meaning the base painted surfaces will show through the decals, which allows for pre-shading to be seen. Therefore, a light base colour such as white, light cream or grey is required. The applied 'AK Interactive' Grey (AK758) primer is light enough as good base colour.*

Airbrush a light grey primer, such as 'AK Interactive' Grey (AK758) over the outer surfaces of the fuselage, including the fuselage front and decking panels.

Check the surface is smooth and free of any surface imperfections. If found, sand and re-prime to achieve the required surface finish.

Brush paint the cockpit surround padding with 'Humbrol' Leather (62) with 'AK Interactive' Leather (AK3031) highlights or similar.

To cover grey primer overspray, brush paint the two supports for the observers gun ring with 'Tamiya' Grey-Green IJN (XF76) or similar.

#### Fuselage underside:

Mask off the sides of the fuselage and around the bottom of the front side panels.

Airbrush the underside of the fuselage with 'Tamiya' Dark Yellow (XF60) or similar.

Remove all masking and foam fillers.

#### Pre-shading:

**NOTE:** *The fuselage of this aircraft was clad in plywood and usually the panel joints would be seen. However, this aircraft was painted with a common five colour lozenge pattern, which was then stipple painted. Therefore, the panel seams were paint filled and were effectively hidden, as can be seen from photographs of these aircraft taken at the time. As such, the only pre-shading that can be applied is general staining.*

Airbrush 'Tamiya' Smoke (XF19) **lightly** around the lower wing locating recesses at the bottom edge of the fuselage sides.

#### Decals (continued):

Airbrush the fuselage with several light coats of clear gloss, such as 'Alclad' Aqua Gloss 600 or similar.

Check again that the surface is smooth and free of any surface imperfections.

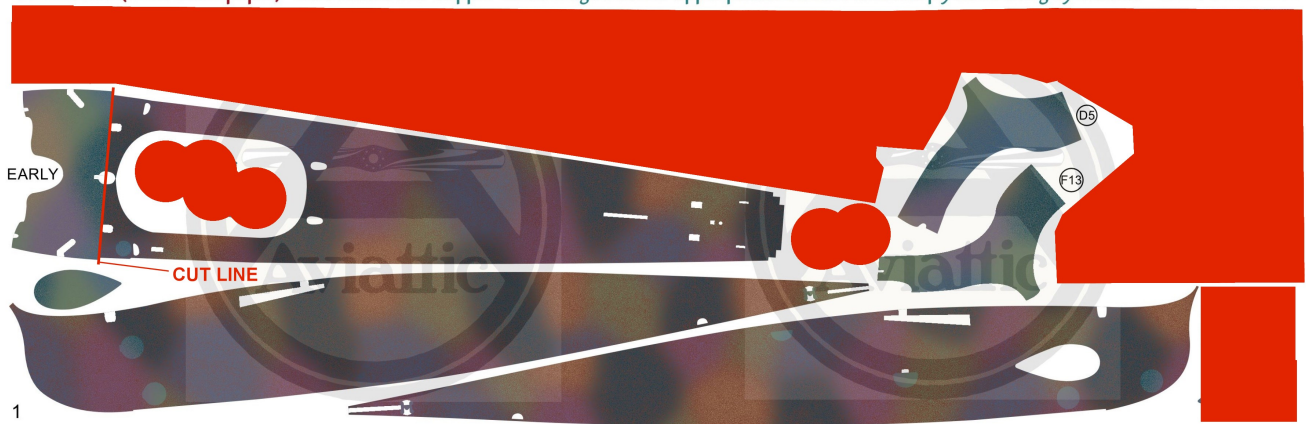
Brush paint the face of the Tachometer/Manometer (A90 with a clear gloss, such as 'Tamiya' Gloss (X22) or similar.

#### 'Aviatic' decals:

**NOTE:** *The exterior decals for the fuselage are from the 'Aviatic' Halberstadt Cl.II 5 colour fuselage stipple surfaces (ATT32209). These are not 'cookie' cut decals and do need to be carefully cut out from the supplied sheet.*

*The decals marked in red are those not required for this particular model.*

ATT32209 (Clear decal paper) Halberstadt CLII "stipple" camouflage 5 colour upper palette on red varnished plywood and grey enamel ©AVIATTIC 2019



Carefully cut out each required decal cutting as close as possible to the edges of each decal. Cut out the open cockpit area and the two openings behind the rear of the cockpit. Other openings and slots should be slit through the clear sections to allow for the decal clear carrier to be conformed in the model during application.



**NOTE:** Refer to Part 4 (Decals) for more information on applying 'Aviatic' decals.

#### Fuselage top:

Cut out the open cockpit area, the two openings behind the rear of the cockpit and the small rectangular opening on the left of the cockpit opening.

**NOTE:** To make it easier to apply the fuselage top decal it's best to cut off the front of the decal that covers the fuselage decking panel. This can be applied separately.

Refer to the previous illustration - cut off the front of the decal that covers the fuselage decking panel.

Clear decal for openings and slots should be slit through or cut out to allow for the decal clear carrier to be conformed in the model during application.

**NOTE:** During the following step, take care not to tear the decal forward from the cockpit pit opening, as the backing sheet will tend to grip that area when applying the decal.

Apply the decal start at the top, rear of the fuselage and holding that area in position, carefully slide the backing sheet forwards to release the decal onto the fuselage and over the two rear supports for the observers gun ring.

Align the decal clear areas to those areas on the fuselage, taking care to position the decal over any protruding detail in the fuselage.

Use a large flat and soft brush to brush out any residual decal water from under the decal then fully conform the decal onto the fuselage surface. I wear a lint free cotton glove to press down the decal to conform it and finally expel any residual decal water.



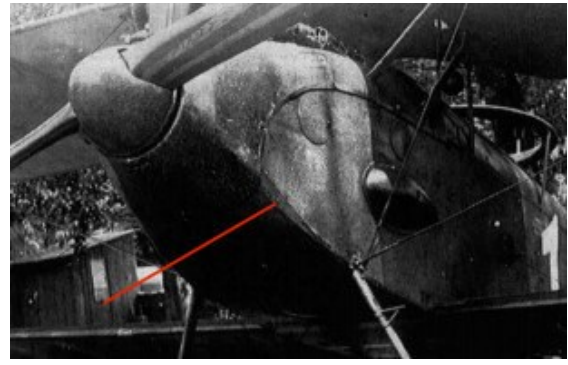
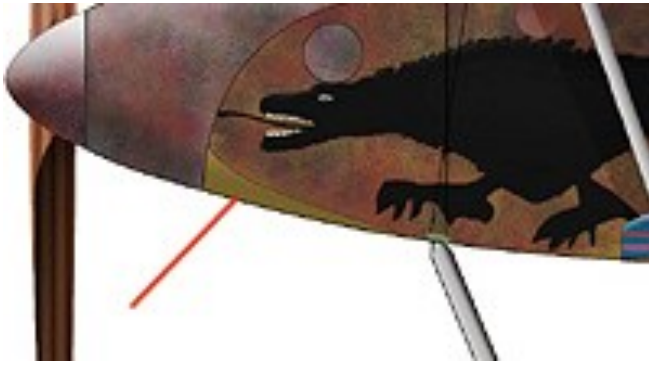
Once the decal has fully set, carefully pierce through any clear decal areas over recesses, holes or slots then apply by brush 'MicroSol' solution to conform those areas of decal into their holes, recesses or slots. If necessary, using a brush **dampened only** with 'Tamiya' X20A thinners will melt and conform stubborn areas of decal.

#### Fuselage port (left) side:

Cut out the small rectangular opening for the protruding pilots step.

Clear decal for openings and slots should be slit through or cut out to allow for the decal clear carrier to be conformed in the model during application.

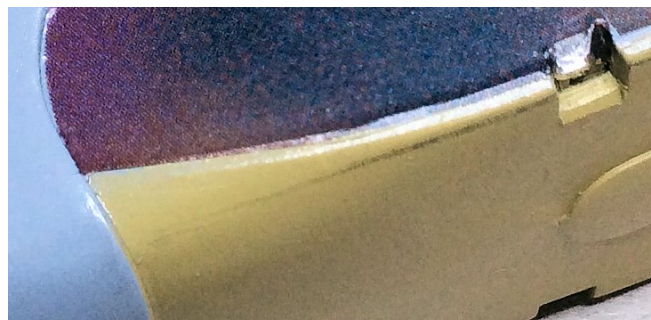
**NOTE:** The fuselage side decals have a wrap around at the bottom, front, which is intended to wrap under the fuselage. However, as can be seen on the following photograph and the colour profile for this aircraft, the stipple effect was not applied under the fuselage nose.



Locate the cut-out decal onto the fuselage left side and over the protruding pilots step, making sure the decal edges are aligned to the fuselage.

Using a pencil, mark the contour at the bottom front of the fuselage onto the rear of the decal.

Carefully cut away the marked area and check the decal on the fuselage side. If necessary, cut the decal to achieve an aligned and correct fit.



**NOTE:** During the following step, take care not to tear the decal at the bottom of the lower wing locating slot, as the backing sheet will tend to grip that area when applying the decal.

Starting at the front of the fuselage, apply the decal, sliding the backing sheet rearwards and over the protruding pilots step.

To allow the decal water under the decal at the crew steps, prick through the decal over the steps with a needle then press out the water using a cotton bud or similar.

Use a large flat and soft brush to brush out any residual decal water from under the decal then fully conform the decal onto the fuselage surface. I wear a lint free cotton glove to press down the decal to conform it and finally expel any residual decal water.

Once the decal has fully set, carefully pierce through any clear decal areas over recesses, holes or slots then apply by brush 'MicroSol' solution to conform those areas of decal into their holes, recesses or slots. If necessary, using a brush **dampened only** with 'Tamiya' X20A thinners will melt and conform stubborn areas of decal.

Apply the cut-out decal for the generator blacking plate and apply it over the clear decal covering the blacking plate on the fuselage side.



### Fuselage starboard (right) side:

Clear decal for openings and slots should be slit through or cut out to allow for the decal clear carrier to be conformed in the model during application.

Repeat the procedure used on the fuselage left decal to cut away the bottom, front wrap around area of the decal.

Starting from the front of the fuselage, apply the decal using the same procedure as used for the fuselage left side.



### Fuselage decking panel:

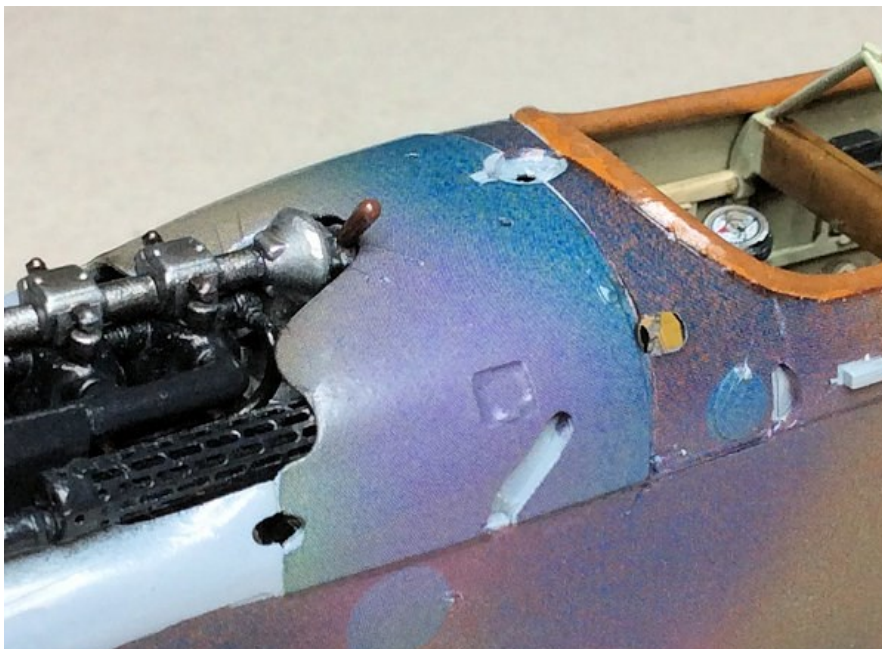
Clear decal for openings and slots should be slit through or cut out to allow for the decal clear carrier to be conformed in the model during application.

**NOTE:** *Due to the compound curves of the fuselage decking panel, some creasing of the decal may occur. If so, carefully slice that area of the decal and apply 'MicroSol' or 'Tamiya' X20A thinners to conform the decal.*

Apply the previously cut away decal over the fuselage decking panel.

Use a large flat and soft brush to brush out any residual decal water from under the decal then fully conform the decal onto the fuselage surface. I wear a lint free cotton glove to press down the decal to conform it and finally expel any residual decal water.

Once the decal has fully set, carefully pierce through any clear decal areas over recesses, holes or slots then apply by brush 'MicroSol' solution to conform those areas of decal into their holes, recesses or slots. If necessary, using a brush **dampened only** with 'Tamiya' X20A thinners will melt and conform stubborn areas of decal.



### Fuselage front side panels:

Clear decal for openings and slots should be slit through or cut out to allow for the decal clear carrier to be conformed in the model during application.

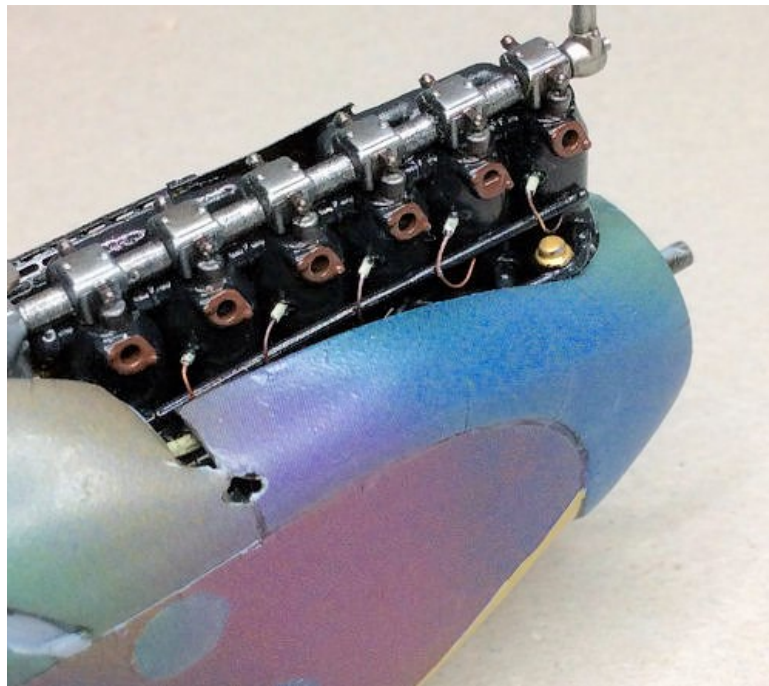
**NOTE:** *Due to the compound curves of the fuselage front panels, some creasing of the decals may occur. If so, carefully slice that area of the decals and apply 'MicroSol' or 'Tamiya' X20A thinners to conform the decal.*

Apply the decal **D5** over the fuselage **starboard (right) front panel**.

Use a large flat and soft brush to brush out any residual decal water from under the decal then fully conform the decal onto the fuselage surface. I wear a lint free cotton glove to press down the decal to conform it and finally expel any residual decal water.

Once the decal has fully set, carefully pierce through any clear decal areas over recesses, holes or slots then apply by brush 'MicroSol' solution to conform those areas of decal into their holes, recesses or slots. If necessary, using a brush **dampened only** with 'Tamiya' X20A thinners will melt and conform stubborn areas of decal.

Repeat the procedure to apply the decal **F13** over the fuselage **port (left) front panel**.



### Created decals:

The decals created for this model were the black 'Devil Cat', two black 'ANNI', the imp and the devil face.

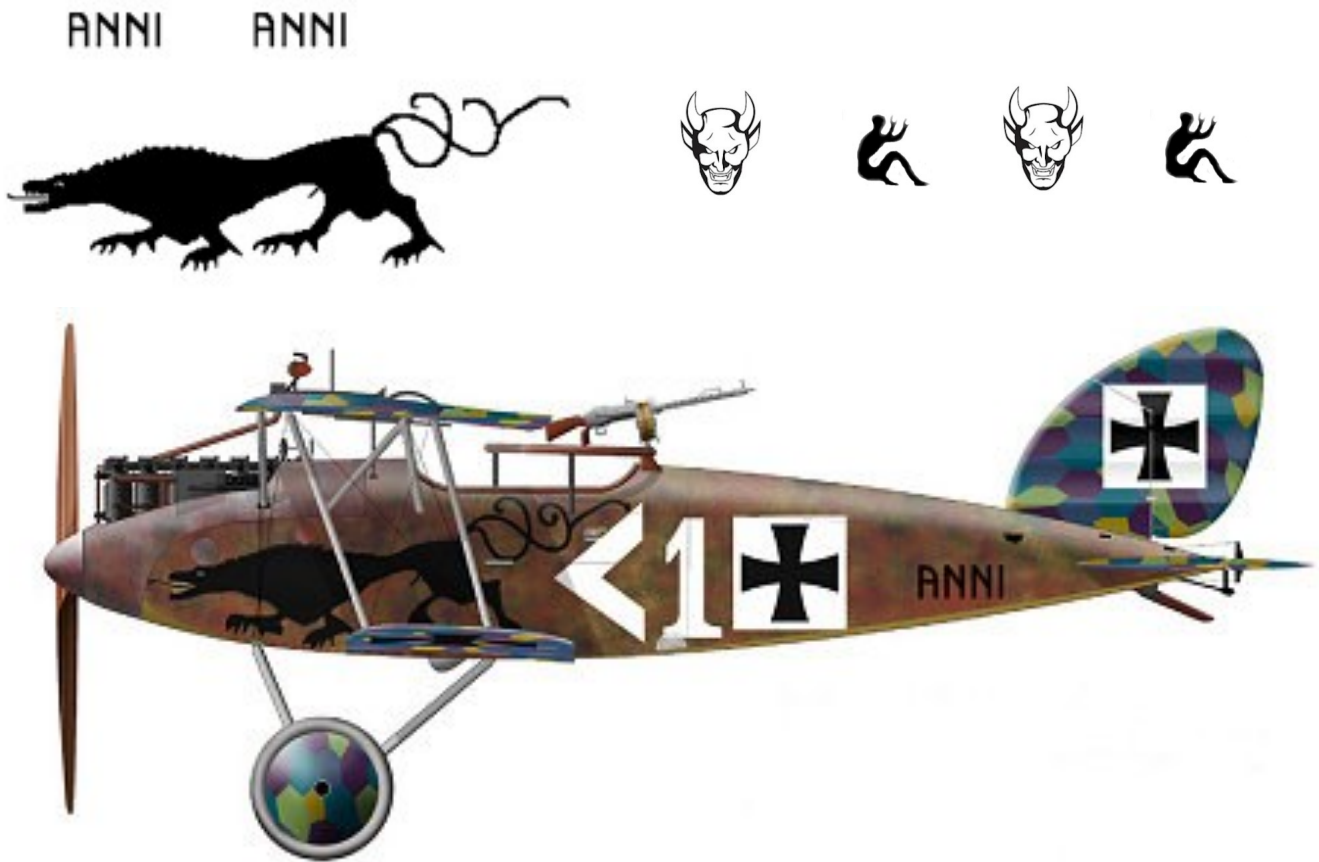
The black 'Devil Cat' and two black 'ANNI' were copied from the colour profile into Paint Shop Pro 2019 software on my PC. They were then test printed on paper and resized as necessary to match the model size.

They were then printed on my Canon IP7250 inkjet printer and on 'MDP' (Mr Decal Paper) Clear water slide decal paper.

The printed decals were given two light sealing coats of 'Krylon' Acryli-Quik sealer to seal in the ink and prevent bleeding of the colours when the decals are applied.

The imp figure was traced from the photograph of the aircraft shown in 'The Aircraft and Crew' part of this build log. The devil face was from an online clip art gallery, being as close as I could find to the aircraft marking. Both were processed as for the previous decals.

**NOTE:** After the fuselage was completed, I noticed that I had not included a wing on the back of the Imp figure. This was hand painted on.



Carefully cut out the 'Devil Cat' decal for the fuselage left side and the 'ANNI' decal, cutting as close as possible to the print.

Apply the 'Devil Cat' decal to the fuselage forward area as shown on the colour profile.

Apply the 'ANNI' decal to the fuselage rear area as shown on the colour profile.

Repeat the process to apply the imp figure and devil face to the fuselage right side.

Kit supplied decals:

**NOTE:** Refer to pages 10, 21 and 22 of the kit instructions for the placement of the kit supplied decals.

The kit supplied decals used for this model are:

Page 10 - Fuselage mounted Tachometer/Manometer - 85 and 86

Page 21 and 22 - fuselage markings 38, 41, 43, 45, 56, 58

Apply decal 41 to the fuselage left side as shown on the colour profile.

Apply decal 43 to the fuselage left side as shown on the colour profile.

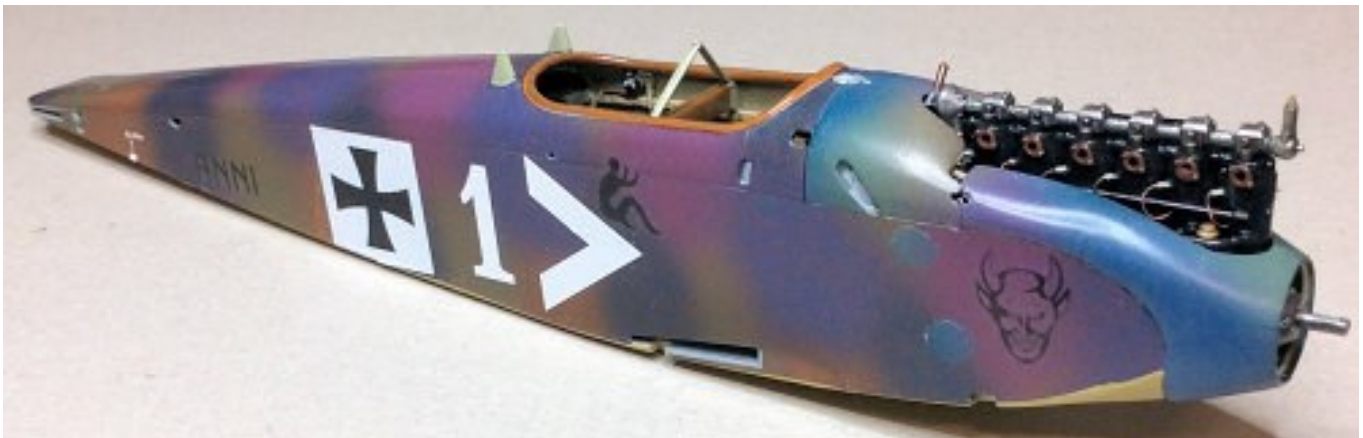
Apply decal 56 to the fuselage left side as shown on the colour profile.

Repeat the process to apply decals 41, 43 and 58 to the fuselage right side.

Apply decals 85 and 86 to the Tachometer/Manometer (A9).

Brush sparingly 'MicroSol' solution over the applied created and kit supplied decals.

To represent the glass of the instruments, brush a clear gloss coat, such as 'Tamiya' Clear Gloss (X22) or similar over the faces of the Tachometer and Manometer (A9).



**Assembly (continued):**

Cement the Tachometer/Manometer (A9) into its fuselage recess, just forward from the cockpit.



## **Weathering:**

To provide a good base for weathering and to seal in applied decals, airbrush the parts with a matte clear coat, such as 'Alclad' Flat (ALC314) or similar.

Refer to Part 3 (Weathering) of this build log for more information. I applied 'Flory Models' Dark Dirt fine clay wash over the model parts.

Seal in the weathering by airbrushing the fuselage with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

Brush a clear gloss coat, such as 'Tamiya' Clear Gloss (X22) or similar over the faces of the Tachometer and Manometer (A9).

**NOTE:** *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Represent a worn paint effect on the fuselage nose panels dry brushing the machine gun with 'Mr. Colour' Super Iron 2 (SM203) or similar.



It was at this stage I noticed that the Imp figure should have a wing on its back, which I had not included on the decal. Therefore, I hand painted the wing onto the Imp, using 'Tamiya' Semi-Gloss Black (X18).

I also hand painted the eyes and teeth of the devil face and the 'Devil Cat' with 'Tamiya' Deck Tan (XF55).

The painted areas were sealed by airbrushing with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.





**NOTE:**

*When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

*Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part.*

*'Wingnut Wings' models parts are made with very close tolerances and any primer or paint may stop parts locating fully together.*

**Ailerons:**

**NOTE:** *The following steps are required if the upper wing ailerons are to be positioned other than inline with the wing. If one aileron is angled up, the other aileron should be angled down by the same amount.*

Point mark two points in the centre of the leading edge of the port (left) aileron (B8), 1.5mm from the aileron hinge recesses.

Using the point marks as guides, drill holes of 0.5mm diameter, 4 to 5mm into the leading edge, making sure the drill does not break through the surface of the aileron.

Cut two short lengths of 0.4mm Brass rod, such as that from 'Albion Alloy's' or similar.

Secure the rods into the pre-drilled holes, using thin CA adhesive.

Position the aileron at its hinges on the upper wing (port (left) aileron) and mark the location of the two aileron rods.

Point mark the two points in the centre of the trailing edge of the upper wing at the port (left) aileron.

Using the point marks as guides, drill holes of 0.5mm diameter, 4 to 5mm into the trailing edge of the upper wing, making sure the drill does not break through the surface of the wing.

Fit the aileron B8 into the pre-drilled holes in the upper wing, making sure the aileron leading edge fully locates against the wing.

Slightly bend the aileron rods to move the aileron either up or down.

Remove the aileron.

Repeat the procedure to position the opposite aileron (B7) at the starboard (right) side of the upper wing, making sure the aileron is angled opposite to the port (left) (B8) aileron.



### **Assembly (continued):**

Cement the underside of the upper wing centre section (D8) onto the top of the centre section (D9).

Cement the starboard (right) outer upper wing (B4) into the upper wing centre section assembly.

Cement the port (left) outer upper wing (B3) into the upper wing centre section assembly.

**NOTE:** *The following three steps should be carried out before the cemented parts are fully set.*

Cement the landing gear main axle (A19) and two bracing bars (A18) into their locations on the lower, inner of the starboard (right) landing gear strut(D12).

Cement the other ends of the landing gear main axle (A19) and two bracing bars (A18) into their locations on the lower, inner of the port (left) landing gear strut (D12).

Locate the landing gear struts assembly into their location recesses in the underside edges of the fuselage and leave in position to allow the cemented parts to fully cure.

Remove the landing gear assembly.

### **Painting (continued):**

**NOTE:** *The kit supplied wheels (D7) are replaced by the 3D printed resin 'Proper Plane' Continental 760x100 tyres and inner wheel covers set (RW-002). The kit supplied outer wheel covers (A43) will be used later in this build.*

Airbrush the two kit supplied wheel outer covers (A43) with grey, such as 'AK Interactive' Grey primer (AK758) or similar. The 'Proper Plane' tyres and inner covers are printed in grey so need no painting.

Mask off the underside of the centre section of the upper wing, as this will be painted in wood effect.

**NOTE:** *The 'Aviatic' decals that will be applied are printed 'clear', meaning they are translucent and painted surfaces underneath will show through the decal. Therefore, priming the parts with white will provide a light base coat, which will show the linen effect of the decals.*

Airbrush a white base coat, such as 'AK Interactive' White primer (AK759) or similar over the following parts:

- Upper wing assembly (both sides)
- Both lower wings (both sides)
- Both ailerons (both sides)
- Fin (both sides)
- Rudder (both sides)
- Tailplane and elevator assembly (both sides)
- Both outer wheel covers
- Propeller spinner

Make sure all painted surfaces are smooth and free of any surface imperfections or artifacts.

To highlight the wing ribs tapes on the top surface and undersides of the wings, rudder and tailplane/elevators, lightly sand across the rib tapes using a soft and wide sander.

To provide a good surface for applying decals, airbrush several light coats of a gloss clear coat, such as 'Alclad' Aqua Gloss 600 or similar.

Check again to sure all glossed surfaces are smooth and free of any surface imperfections or artifacts.

#### Upper wing detail:

Lightly pre-shade by airbrushing **around the edges** with a 'Tamiya' Smoke (X19) or similar:

Centre section top surface of the upper wing:

- Radiator and fuel tank
- Plates for the aileron bell cranks
- Recesses
- Forward outer side plates.

Centre section underside of the upper wing:

Radiator.

Left and right outer wings - top surface:

Interplane strut plates and wing root access panels.

Left and right outer wings - undersides:

Interplane strut plates.

Wing trailing edges - wing (both sides).

Mask around the radiator on the centre section top surface and underside.

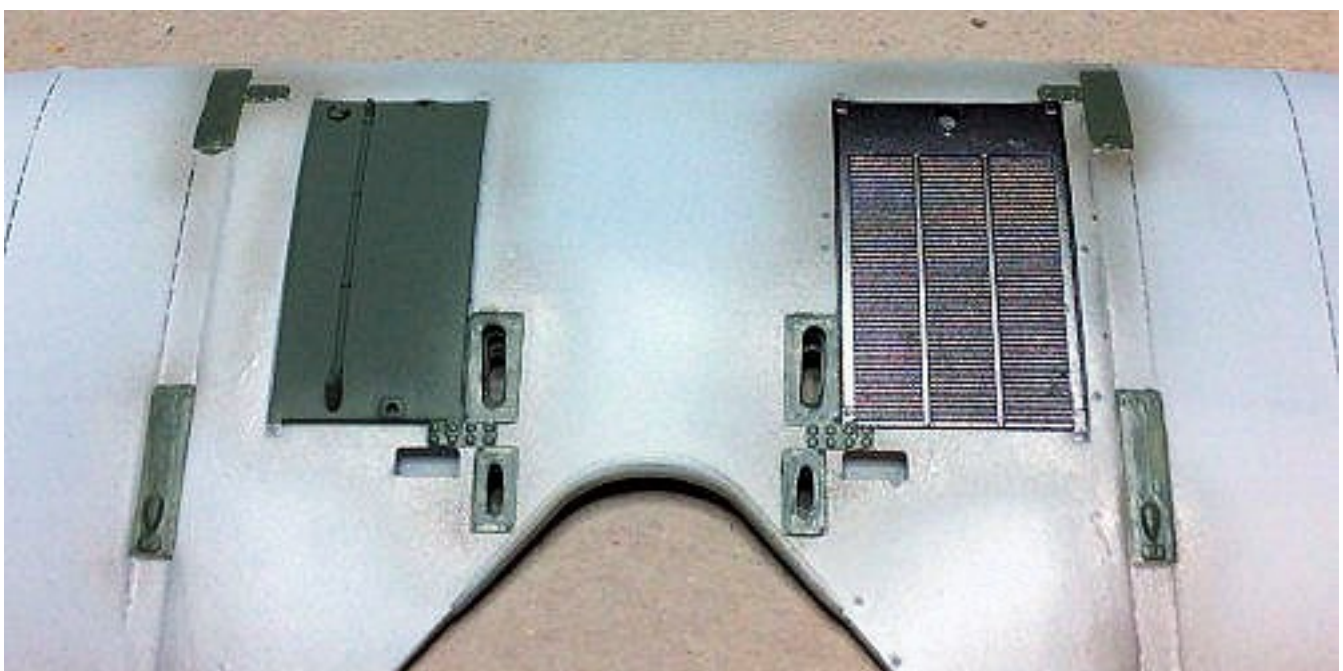
Airbrush the radiators with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

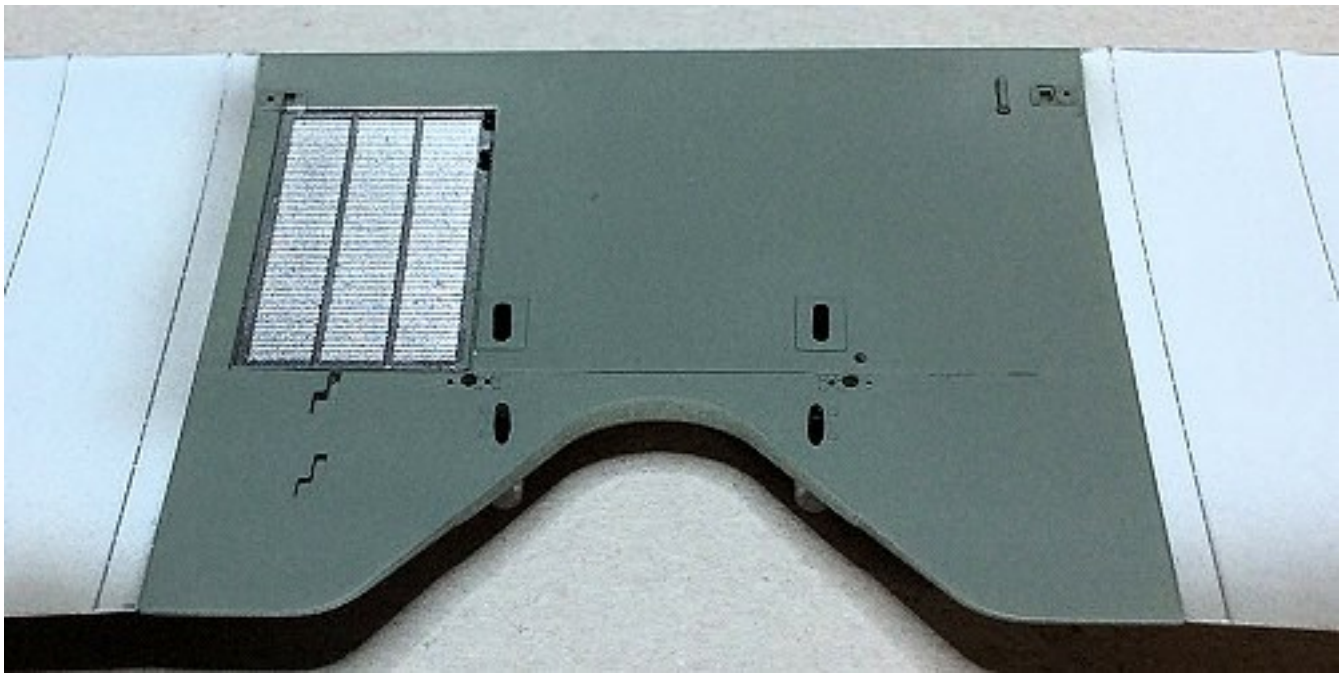
Airbrush the radiators with steel, such as 'Alclad' Steel (ALC112) or similar.

Top surface - mask of the painted radiator and around all of the previously pre-shaded details.

Underside surface - mask around the centre section and all of the previously pre-shaded details.

Airbrush the previously pre-shaded details and centre section underside with 'Tamiya' RLM Grey (XF22) or similar.





Lower wing detail:

Lightly pre-shade by airbrushing **around the edges** with a 'Tamiya' Smoke (X19) or similar:

Left and right wings - top surface:

Interplane strut plates, wing root access panels, compass (left wing) and large foot board (left wing).

Left and right wings - undersides:

Interplane strut plates and underside of compass (left wing).

Wing trailing edges - lower wings (both sides).

Mask around the previously pre-shaded details centre section and all of the previously pre-shaded details.

Airbrush the previously pre-shaded details and centre section underside with 'Tamiya' RLM Grey (XF22) or similar.

Remove all masking.

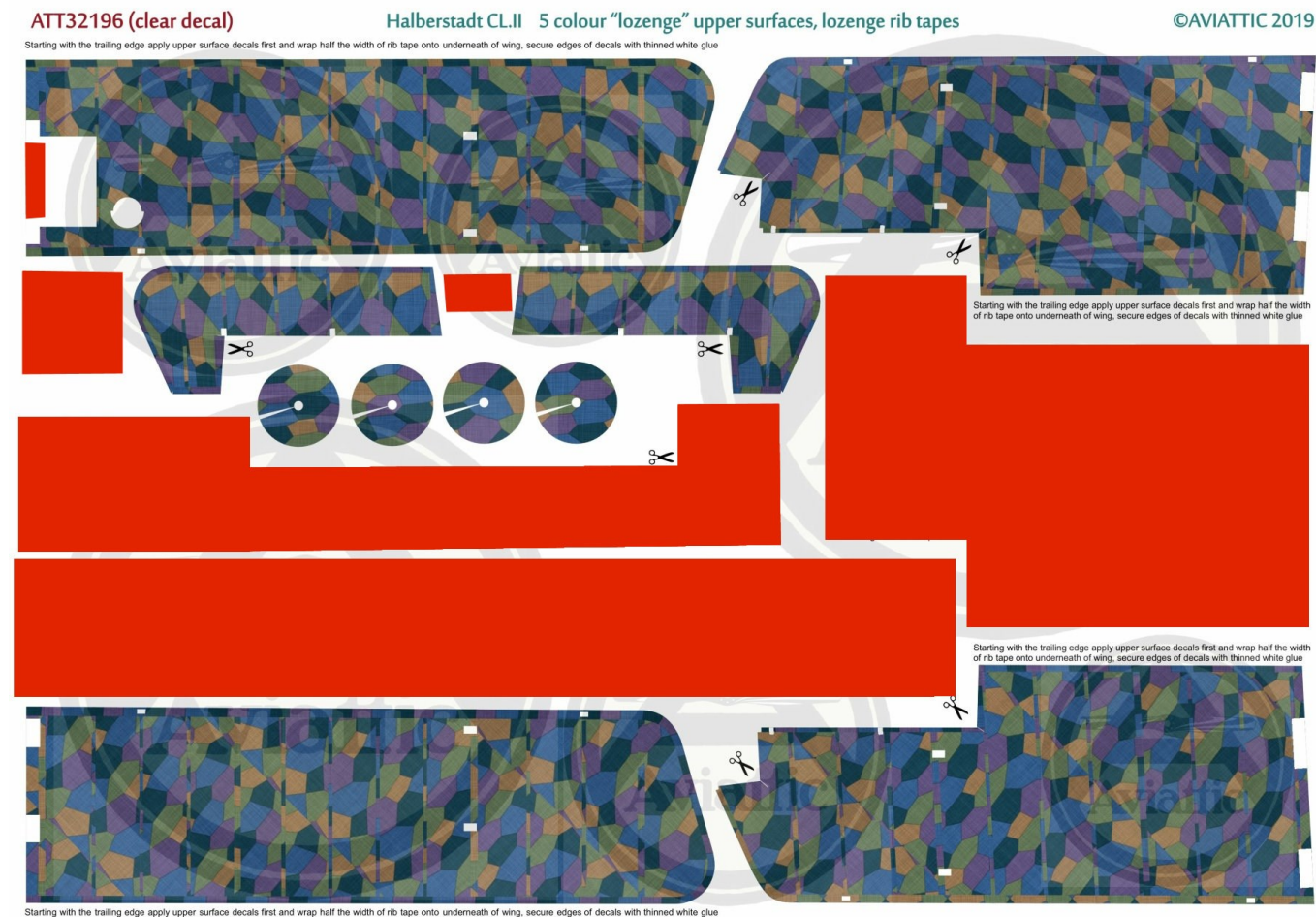


## Decals (continued):

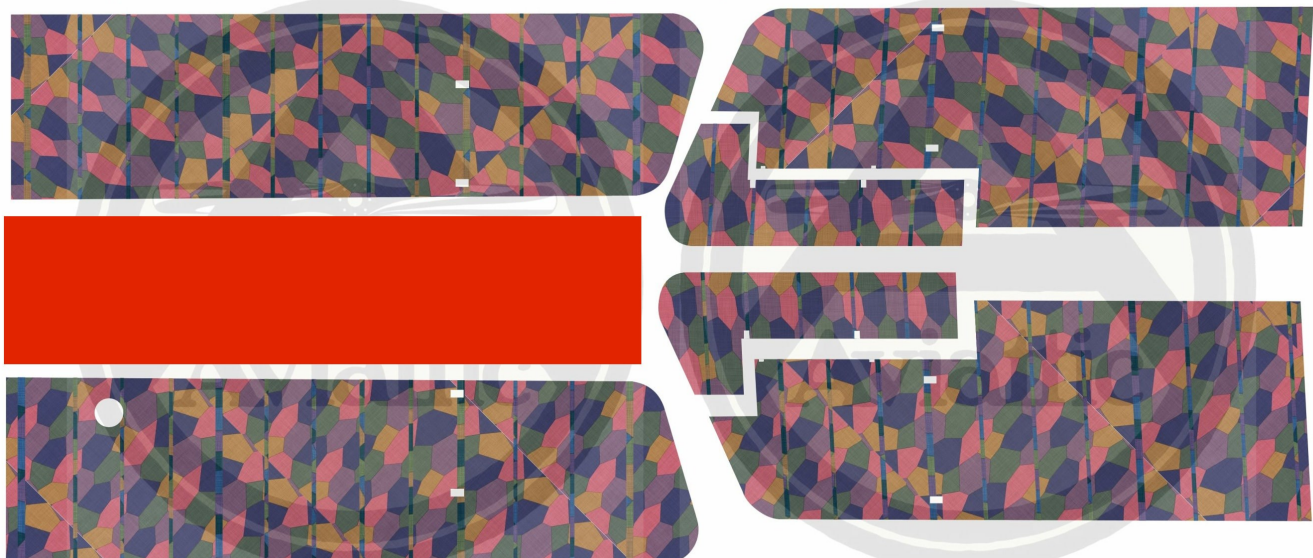
### 'Aviatic' decals:

**NOTE:** The exterior decals for the fuselage are from the 'Aviatic' Halberstadt Cl.II 5 colour Decal sheets (ATT32196, ATT32199, ATT32205 and ATT32209). These decals are not 'cookie' cut and do need to be carefully cut out from the supplied sheet.

The decals marked in red are those not required for this particular model.



ATT32199 (clear decal) Halberstadt CL.II 5 colour alternative palette "lozenge" lower surfaces, lozenge rib tapes ©AVIATIC 2019





Preparation:

Carefully cut out each required decal cutting as close as possible to the edges of each decal.

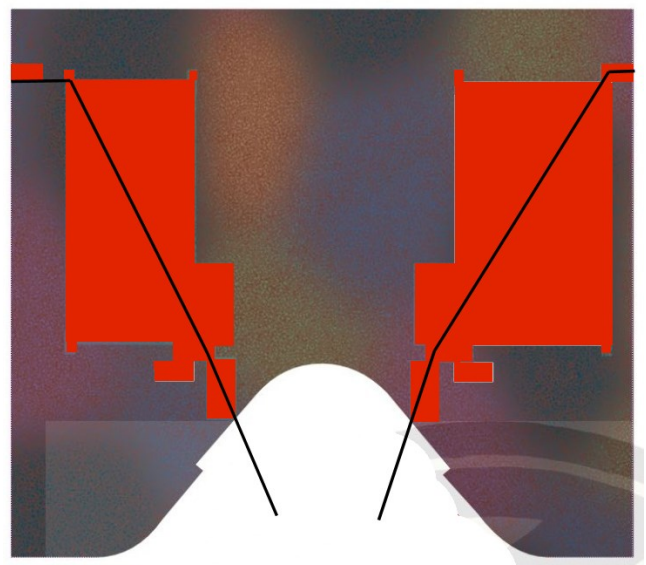
Using a scalpel blade or similar, carefully cut out the clear areas of each decal.

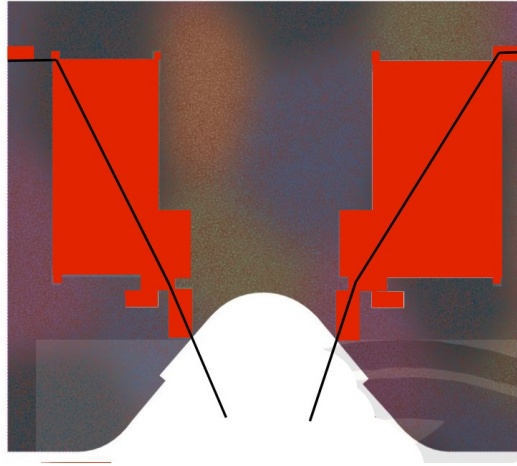
**NOTE:** I chose to the centre section details on the top surface of the upper wing. Therefore, in addition to clear areas, printed areas of the centre section decal were cut out.

Cut out those areas shown in red on the centre section decal on sheet ATT32209.

Upper wing top surface - centre section:

As I chose to paint the surface details of this area, the decal had more areas removed and this made the decal delicate and liable to tearing during application. There I cut the decal into three sections, as shown by the black coloured cut lines on the following illustration. This made the decal easier to apply.





#### Wheel covers:

Despite being printed to shape, I found the ends of the wedge shaped cut joint overlapped when the decals were applied. Once the decals were applied I used a sharp curved scalpel blade to cut along the dark shaded overlapped decal and carefully remove it, leaving a correct join of the decals ends.

#### Propeller spinner:

Despite being printed to shape, I found the propeller spinner decal could not be applied without creating many folds and creases, which on such a small model part, would be extremely difficult to hide. Therefore I chose **not to use that decal** and instead paint the spinner.

#### Application:

##### **NOTE:**

*Refer to Part 4 (Decals) of this build log for more information on applying 'Aviatic' decals. The decal sheets have instructions on applying the lozenge decals to the wings and tail unit. The underside decals are intended to locate within the wrapped over lozenge edges from the upper surface lozenge decals. Therefore, the upper surface decals need to be applied first, applying them from the trailing edges forwards to the leading edges, wrapping 50% of the edging tapes onto the underside of the wings and tail unit. Also the corners of the decals need to be sliced to allow them to conform over the edges of the parts.*

*During application, take care not to tear the decals at the smaller and more delicate parts of the decal, as the backing sheet will tend to grip those area when applying the decal.*

#### Top surface decals - application:

**NOTE:** *The top surface decals are those for the upper wing, both ailerons, both lower wings, both tailplanes, elevator, both sides of the fin and rudder and both kit supplied wheel outer covers and the 'Proper Plane' inner wheel covers.*

#### Underside surface decals - application:

**NOTE:** *The underside surface decals are those for the upper wing, both ailerons, both lower wings, both tailplanes and the elevator.*

In addition to the decal sheet instructions and Part 4 (Decals) of this build log:

Align the decal cut-out clear areas to those areas on the surface of the parts, taking care to position the decal over any protruding detail in the fuselage.

Use a large flat and soft brush to brush out any residual decal water from under the decal then fully conform the decal onto the fuselage surface. I wear a lint free cotton glove to press down the decal to conform it and finally expel any residual decal water.

Brush 'MicroSol' solution to conform those areas of decal around detail and curves. If necessary, using a brush **dampened only** with 'Tamiya' X20A thinners will melt and conform stubborn areas of decal.

The underside decals are intended to locate within the wrapped over lozenge edges from the upper surface lozenge decals.

Kit supplied decals:

**NOTE:** Refer to Part 4 (Decals) of this build log for more information on applying decals.

The kit supplied decals used for this model are:

Page 11 and 14 - Port (left) lower wing compass - 79

Page 13 and 24 - Wings leading edge placards - 42

Page 21 and 22 - Fin and rudder - 46, 48, 49, 50

Upper wing - 39, 40, 44, 47

Lower wings - 31

Page 25 - Rudder - 108.

**NOTE:** Refer to pages 11, 13, 14, 21, 22 and 25 of the kit instructions for the locations of the kit supplied decals.

Apply the relevant kit supplied decals to their correct locations on the model.

### **Painting (continued):**

Brush paint the head padding on the curved trailing edge of the upper wing centre section with 'AK Interactive' Brown Leather (AK3031) or similar.

Airbrush the following with a grey primer, such as 'AK Interactive' Grey (AK758) or similar:

Radiator shutter (F10), Compass shield (A26) and Radiator filler cap (A77).

Airbrush the previous parts with a 'Tamiya' RLM Grey (XF22) or similar.

Brush paint the rudder and elevator control horns 'Tamiya' Grey-Green IJN (XF76) or similar.

### **Assembly (continued):**

Cement the radiator shutter (F10) into its locating recesses on the underside of the upper wing (radiator).

Cement the compass shield (A26) into its recess in the top surface of the lower left wing.

Cement the radiator filler cap (A77) into its recess in the radiator on the top surface of the upper wing.

### **Weathering:**

To provide a good base for weathering and to seal in applied decals, airbrush the wings and tail unit parts with a matte clear coat, such as 'Alclad' Flat (ALC314) or similar.

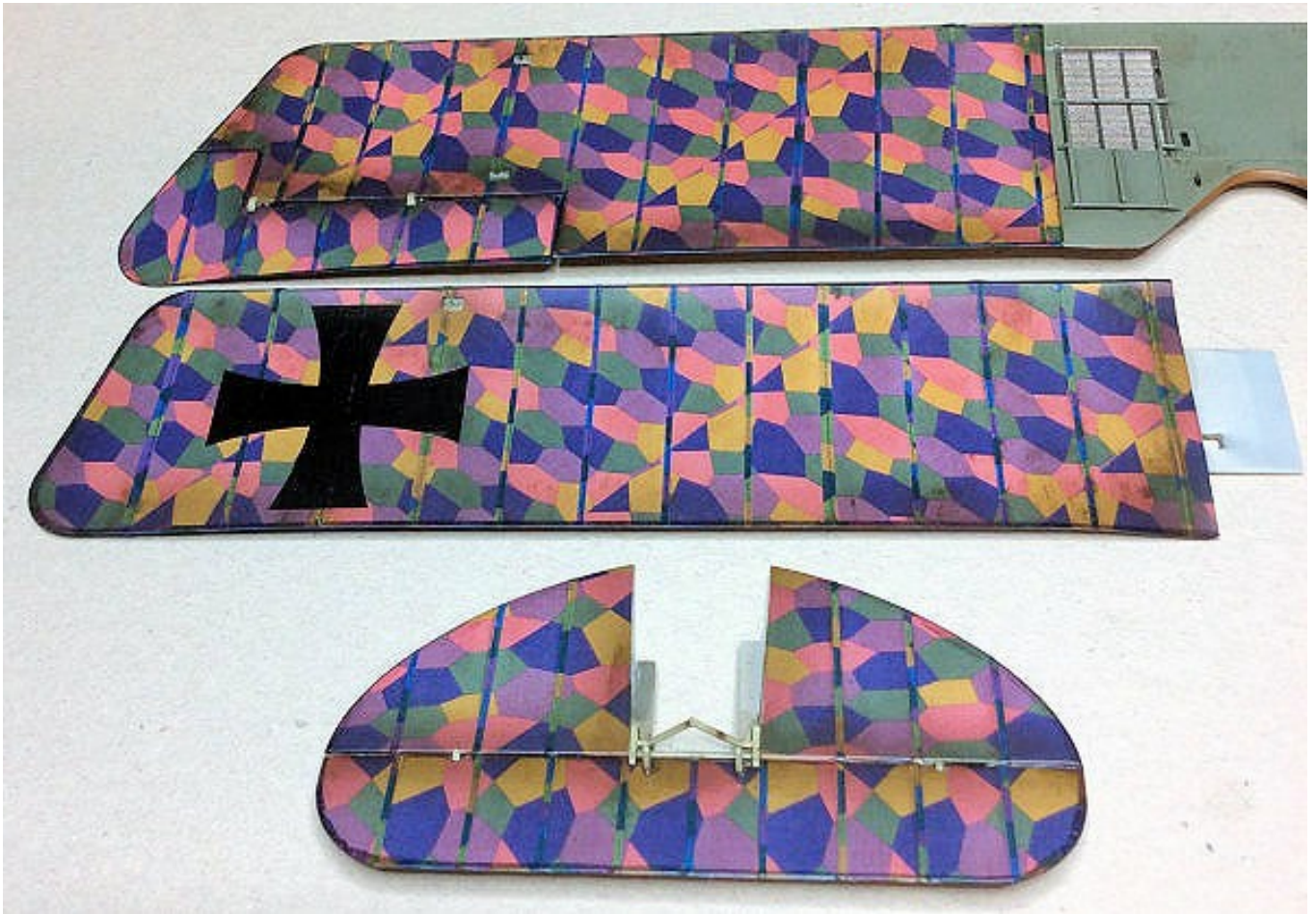
Refer to Part 3 (Weathering) of this build log for more information. I applied 'Flory Models' Dark Dirt fine clay wash over the model parts.

Seal in the weathering by airbrushing the wings and tail unit parts with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

### **Assembly (continued):**

Cement the two halves of the observers gun mounting ring (A20, A89) together.





## Painting (continued):

**NOTE:** Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part. The remaining parts to be painted are:

Landing gear assembly (pre-assembled)

Interplane struts (A3 x2, A17 x2)

Fuselage cabane struts (A69, A72, A79, A81)

Observers gun mounting ring and support struts (A20, A57 (x2), A89)

Tail skid (A25)

Trailing aerial (A39)

Propeller spinner and back plate (A21, A22)

Aileron control bell-cranks (A27 x2)

Engine upper coolant pipe (F11)

Parabellum gun mount (A74, A80)

The kit does not supply some of the observers weapons for this particular aircraft.

Therefore, only the flare pistol E38 was used, the rest 'borrowed' from a 'Wingnut Wings' Hannover Cl.II kit (32024).

*Flare pistol E38*

Hannover Cl.II kit:

*Flare rack D11*

*'Grantenwerfer 16' grenades (x5) G22*

*Bomb rack G77 (0.5 mm thick plastic card back added to give more contact area for securing to the fuselage side).*

Airbrush all of the above parts with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the parts as follows:

**'Tamiya' Grey-Green IJN (XF76)** or similar - Observers gun mounting ring and support struts, engine upper coolant pipe, trailing aerial, Parabellum gun mount (x2).

**'Tamiya' Dark Sea Grey (XF54)** or similar - Interplane struts (x4), fuselage cabane struts (x4), landing gear assembly, propeller spinner, aileron control bell-cranks (x2).

**'Tamiya' Dark Yellow (XF60)** or similar - Bomb rack, flare rack, tail skid.

**'Tamiya' Metallic Grey (XF)** or similar - 'Grantenwerfer 16' grenades.

Refer to Part 2 (Wood Effects) of the build log for more information. Apply wood effects over the flare rack, bomb rack and tail skid, previously painted with 'Tamiya' Dark Yellow (XF60). I used 'Windsor & Newton' Griffin Alkyd Vandyke Brown.

Detail painting:

**NOTE:** Transparent parts requiring painting - radiator sight glass (C2) and windscreen (C1).

Brush paint the details on the parts as follows:

**'Tamiya' RLM Grey (XF22)** or similar - radiator sight glass end fittings.

**'Tamiya' Clear Yellow (X24)** or similar - radiator sight glass

**'Tamiya' Metallic Grey (XF56)** or similar - Shoe of the tail skid, centre axle of the landing gear assembly.

'Mr. Colour' Stainless Steel (213) or similar - ball end of trailing aerial, propeller spinner back plate, flare pistol, tail skid metal fittings, retention hoops over axle ends of landing gear.

'Tamiya' Hull Red (XF9) or similar - hand grip of flare pistol, ball end on locking levers for the observers gun mounting ring and the Parabellum gun mount.

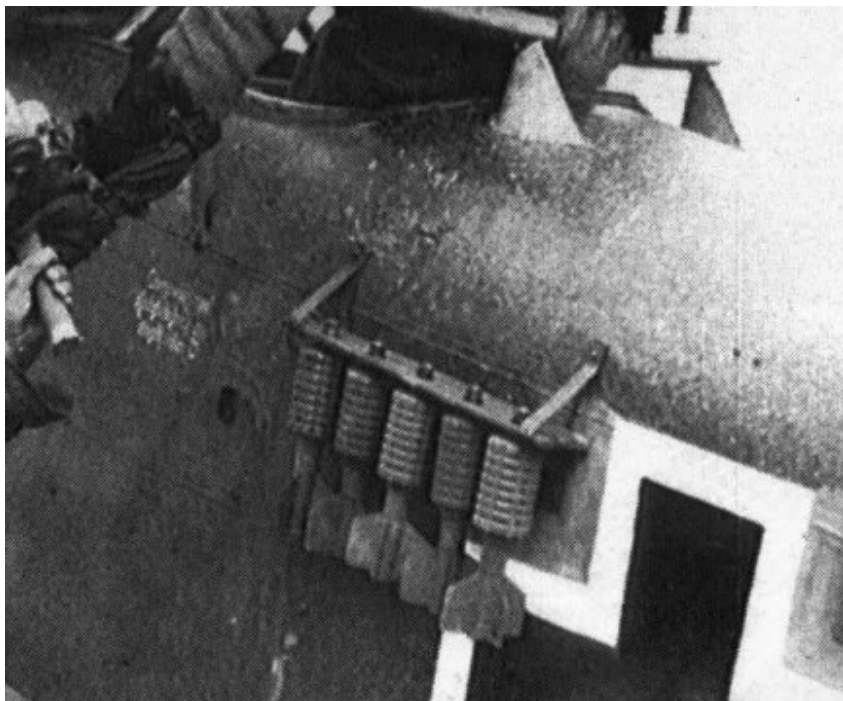
'Tamiya' Rubber Black (XF85) or similar - rubber joints on and engine upper coolant pipe, end fittings on the interplane struts (x4). Once dry, use a sharp pencil to draw over the raised band clamps around each end of the rubber joints on the upper coolant pipe.

'Tamiya' Buff (XF57) or similar - pitot static pipe on left cabane struts (A75, A81), 'bungee' suspension cord on ends of landing gear axle.

Airbrush all of the painted parts with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALKC311) or similar.

### **Assembly continued):**

Use thin CA adhesive to secure the five 'Grantenwerfer 16' grenades into their locating holes in the bomb rack. The bombs are fitted to hang from the underside of the bomb rack shelf.



Cut multiple short lengths of 0.5 mm diameter plastic rod, such as that from 'Plastruct' or similar.

Drill out the flare locating holes in the flare rack (Hannover Cl.II kit D11) using a 0.6 mm diameter drill.

Cement the rods into the rack holes, as desired, making sure the tops of the flares are level.

**NOTE:** *When fitting the Parabellum gun rest (A2) onto the gun mounting ring, make sure it is fitted into the correct hole and aligned to the gun mount, otherwise the Parabellum machine gun will not locate into the rest correctly (refer to the following photograph).*

Locate the Parabellum gun mount (A80) onto its base (A74).

Locate the base (A74) into its locating hole in the gun mounting ring assembly.

Locate the gun rest (A2) into the left locating hole of the gun mounting ring (when viewed from the rear).

Test fit the Parabellum machine gun into the gun mount (A80) and align the base (A74) and gun rest (A2) such that the butt of the machine gun can locate in the rest.



Cement the gun rest into the mounting ring.

Cement the gun mounting to its base.

Cement the base into the mounting ring.

Remove the Parabellum machine gun, for fitting later in this build.



Cement the end cap (A55) on to the exhaust manifold (A56).

**NOTE:** *When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

Cement the left and right lower wings into their locating slots in the sides of the fuselage, making sure they both locate fully into the fuselage.

Cement the tail skid into the open recess on the underside, rear of the fuselage. The tail skid is cemented in position in three locations:

The front locator fits into the offset slot inside the fuselage, which stops the tail skid from moving.

The locating peg on the tail skid locates into the pre-moulded hole just rear of the fuselage opening.

The torsion bar on the tail skid contacts the centre of the 'V' strut under the tailplane.

**NOTE:** *Refer to Part 12 (External pre-rigging) - you may find it easier to pre-rig the elevators and landing gear before fitting to the fuselage.*

Cement the tailplane/elevator assembly into its locating slots in the rear, sides of the fuselage, making sure it slides fully forward into the fuselage.

Cement the landing gear assembly into its four locating recesses in the underside edges of the fuselage. Make sure the landing gear struts fully locate into their recesses.

### **Painting continued):**

#### Details:

Brush paint some the flares, as desired, using 'Tamiya' Red (X7) and Royal Blue (X3) or similar.

Brush paint the end caps of the ammunition flares with 'Mr. Colour' Brass (219) or similar.

#### Exhaust manifold:

Lightly sand the edges of the exhaust manifold to remove any seam lines or mould flash.

Airbrush the manifold with a black gloss base, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the manifold with 'Alclad' Exhaust Manifold (ALC-123) or similar.

Airbrush the manifold with a matte (flat) clear coat, such as 'Alclad' Flat (ALC-314) or similar.

Refer to Part 3 (Weathering) of this build log for more information - apply your desired weathering finish to the manifold - I used 'Flory Models' Dark Dirt or Grey fine clay wash.

Seal the applied weathering with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

Lightly sponge 'Tamiya' Weather Master Set D (Burnt Blue) around engine end of the manifold pipes.

Lightly sponge 'Tamiya' Weather Master Set B (Soot) around the exit port of the manifold.

**PART 12**  
**EXTERNAL**  
**PRE-RIGGING**

## PART 12 - EXTERNAL PRE-RIGGING

### Pre-rigging:

**NOTE:** *At this stage of the build it's best to pre-rig as much of the external rigging wires and flight control cables locations as possible, as access will be restricted when the model is assembled.*

*Refer to Part 6 (Rigging) of this build log and page 15 of the kit instruction manual for more information.*

*The kit parts have some pre-moulded rigging locations. If drilling additional rigging points into the model, take care to not drill the holes too close to strut locations.*

*The rigging materials used are:*

*'Steelon' or 'Stroft GTM' 0.08 and 0.12mm diameter mono-filament,  
'Gaspach' 1/32nd scale metal turnbuckles (One Ended) and Anchor Points,  
'Gaspach' 1/48th scale metal turnbuckles (Type C),  
'Proper Plane' 1/32nd scale 3D printed resin turnbuckles (RD-005),  
'Albion Alloy's' 0.4mm and 0.5mm Brass tube and rod.*

### Example of turnbuckle rigging:

**NOTE:** *Brass or Nickel-Silver tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

*Cut a short length of blackened tube (0.4 or 0.5mm diameter) Brass tube, such as that supplied from 'Albion Alloys' (MBT04 or NST05) or similar.*

*Deburr the tube by running a 0.2 mm or 0.3 mm diameter drill through the tube.*

**NOTE:** *Always cut the length of line **much longer** than needed to span between its attachment points.*

*Cut a long length of 0.08 or 0.12 mm diameter mono-filament (fishing line), such as 'Stroft GTM' or 'Steelon'.*

*Pass the line through the tube, then through the 'eye' of a turnbuckle.*

*Pass the line back and through the tube.*

*Slide the tube up to, **but not touching**, the 'eye' of the turnbuckle.*

*Secure the lines to the tube end away from the turnbuckle, using thin CA adhesive.*



*Cut away any residual tag of line at the tube end.*

*Brush paint the turnbuckle with 'Mr. Colour' Stainless Steel (213) or similar.*

## **Flight control cables:**

### **Rudder:**

Drill holes of 0.3mm diameter through the ends of the two rudder control horns on the rudder (F4).

Prepare a 'Proper Plane' 1:32nd scale 3D printed resin turnbuckle.

Cut a long length of 0.08mm diameter mono-filament, such as 'Stroft GTM' or similar.

Cut a short length of blackened 0.4 mm diameter Brass tube, such as 'Albion Alloy's MBT04 or similar.

Using the example at the beginning of this Part of the build log, attach the line to one 'eye' end of the turnbuckle.

Cut a short length of 0.2mm diameter rod, such as 'Albion Alloy's Nickel-Silver NSR02 or similar.

Pass the rod through the free 'eye' end of the turnbuckle and secure one end of the rod flush with the 'eye' end, using thin CA adhesive.

Repeat the procedure to create the other rudder control line.

### **Elevator:**

Repeat the previous procedure to create the **four** control lines for the elevator (D16).



## **Structural wires:**

### **Incidence wires:**

**NOTE:** *The four interplane struts (A3 x2, A17 x2) have pre-moulded turnbuckles at their bottoms and anchor 'tubes' at their tops. These are intended for the crossed incidence wires between the struts. The turnbuckles are slightly oversized and will not match the aftermarket turnbuckles being used elsewhere on the model. Therefore I chose to replace them.*

Cut away the pre-moulded turnbuckles on the bottom of the interplane struts (A3 and A17).

Sand or file away the pre-moulded anchor 'tubes' on the top of the interplane struts (A3 and A17).



**NOTE:** During the following step, temporarily locate the interplane struts so the drilling angle for the turnbuckles can be noted.

Drill four holes of 0.4mm diameter into, **but not through**, the top surface of the lower wings. One hole behind the two forward interplane struts and one forward from the two rear interplane struts. The holes should be drilled at an angle that aligns with the top of the opposite interplane strut when temporarily fitted.

Drill four holes of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. One hole behind the two forward interplane struts and one forward from the two rear interplane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspach' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Rear flying wires:

Drill a hole of 0.4 mm diameter into the two pre-moulded rigging points towards the rear of the lower wings and the sides of the fuselage. The holes should be drilled at an angle that aligns with the top of the rear interplane struts when temporarily fitted.

Drill a hole of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. A hole should be drilled inboard from the locating holes for each of the rear interplane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspach' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Front flying wires:

Drill a hole of 0.4 mm diameter into the pre-moulded forward rigging points in the top of the forward landing gear struts (forward hole of the two). The holes should be drilled at an angle that aligns with the top of the front interplane struts when temporarily fitted.

Drill a hole of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. A hole should be drilled inboard from the locating hole for each of the front interplane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspach' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Rear landing wires:

Drill a hole of 0.4mm diameter into, **but not through**, the top surface of the lower wings. A hole should be drilled inboard from the locating hole for each of the rear interplane struts. The holes should be drilled at an angle that aligns with the top of the rear 'V' cabane struts, when temporarily fitted.

Drill a hole of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. A hole should be drilled outboard from each of the location holes for the rear 'V' cabane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspach' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Front landing wires:

Drill a hole of 0.4mm diameter into, **but not through**, the top surface of the lower wings. A hole should be drilled inboard from the locating hole for each of the front interplane struts. The holes should be drilled at an angle that aligns with the top of the front cabane struts, when temporarily fitted.

Drill a hole of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. A hole should be drilled outboard from the location holes for each of the front cabane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspatch' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Drag wires:

Drill a hole of 0.4 mm diameter into the rear pre-moulded rigging points in the top of the forward landing gear struts (rear hole of the two). The holes should be drilled at an angle that aligns with the top of the front interplane struts when temporarily fitted.

#### Cabane bracing wires:

Drill a hole of 0.4mm diameter into, **but not through**, the underside surface of the upper wing. A hole should be drilled inboard from the location holes for each of the rear cabane struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspatch' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the underside of the upper wing.

#### Landing gear bracing:

Drill a hole of 0.3mm diameter through the front and rear struts of the landing. The holes should be at each side of the axle retaining straps that loop across the landing gear 'V' struts above the axles.

Drill four holes of 0.4mm diameter into the underside of the fuselage. A hole should be drilled into the pre-moulded recesses in the top of the front and rear landing gear struts. The holes should be drilled vertically into the wing.

Using thin CA adhesive, secure a 'Gaspatch' 1:32nd scale metal Anchor Point into each of the pre-drilled holes in the recesses of the landing gear struts.



### Attaching rigging lines:

**NOTE:** Always cut the length of line ***much longer*** than needed to span between its final attachment points.

Using the example at the beginning of this Part of the build log, permanently attach a long length of 0.12 mm diameter mono-filament, such as 'Steelon' or Stroft GTM', to each of the Anchor Point fitted into the underside of the upper wing and fuselage, making sure the lines are free to move in the Anchor Points.



**PART 13**  
**PHASE 2**  
**CONSTRUCTION**

## **PART 13 - PHASE 2 CONSTRUCTION**

### **NOTE:**

*When cementing large kit parts, I use 'Revell' Contacta Professional cement (39604). This is a thicker liquid cement, which takes longer to fully set, but does provide a stronger bond between larger kit parts. 'Tamiya' liquid cement is used for smaller parts.*

*Before working with model parts, make sure that when removed from their sprues, all mould seams, sprue tags or mould 'flash' are removed from each part.*

*'Wingnut Wings' models parts are made with very close tolerances and any primer or paint may stop parts locating fully together.*

### **Assembly:**

**NOTE:** *In the following step, use a length of 2.0 mm diameter rod to align the propeller parts.*

Slide the back plate for the propeller spinner onto the 2.0 mm diameter rod (correct way around), followed by the 'Proper Plane' propeller (correct way around).

Locate the propeller spinner over the propeller and against the spinner back plate, making sure the two raised edges on the back plate locate fully into the propeller openings in the spinner.

Make sure the spinner back plate is flush with the rear edge of the spinner.

Cement the spinner and back plate together.

Remove the 2.0 mm diameter alignment rod.

Check fit the propeller assembly onto the engine propeller shaft. If necessary, trim the length of the shaft until the spinner back plate is just clear of the front of the fuselage.

### **Decals:**

Kit supplied decals:

**NOTE:** *Refer to pages 11 and 14 of the kit instructions for the placement of the kit supplied decals.*

The kit supplied decals used for this model are:

Page 11 - Interplane struts - 98 to 101

Page 14 - Garuda propeller logos - 96, 97



## **Final rigging:**

**NOTE:** *Final rigging the cross bracing wires on the landing gear at this stage of the build will provide structural strength to the landing gear and help to prevent damage throughout the remainder of the build.*

Prepare a 'Gaspatch' 1:48th scale metal turnbuckle (Type C).

Cut a short length of blackened 0.5 mm diameter Brass tube, such as 'Albion Alloy's MBT05 or similar.

Using the rigging example at the beginning of Part 12 of this build log, attach a pre-rigged line on the landing gear to one end of the 'Gaspatch' Type C turnbuckle.

Cut a length of 0.08mm diameter mono-filament, such as 'Stroft GTM' or similar.

Pass the line from the outside, through the pre-drilled hole in the relevant landing gear strut (diagonally opposite the Anchor Point), then through the free 'eye' end of the turnbuckle and back through the hole.

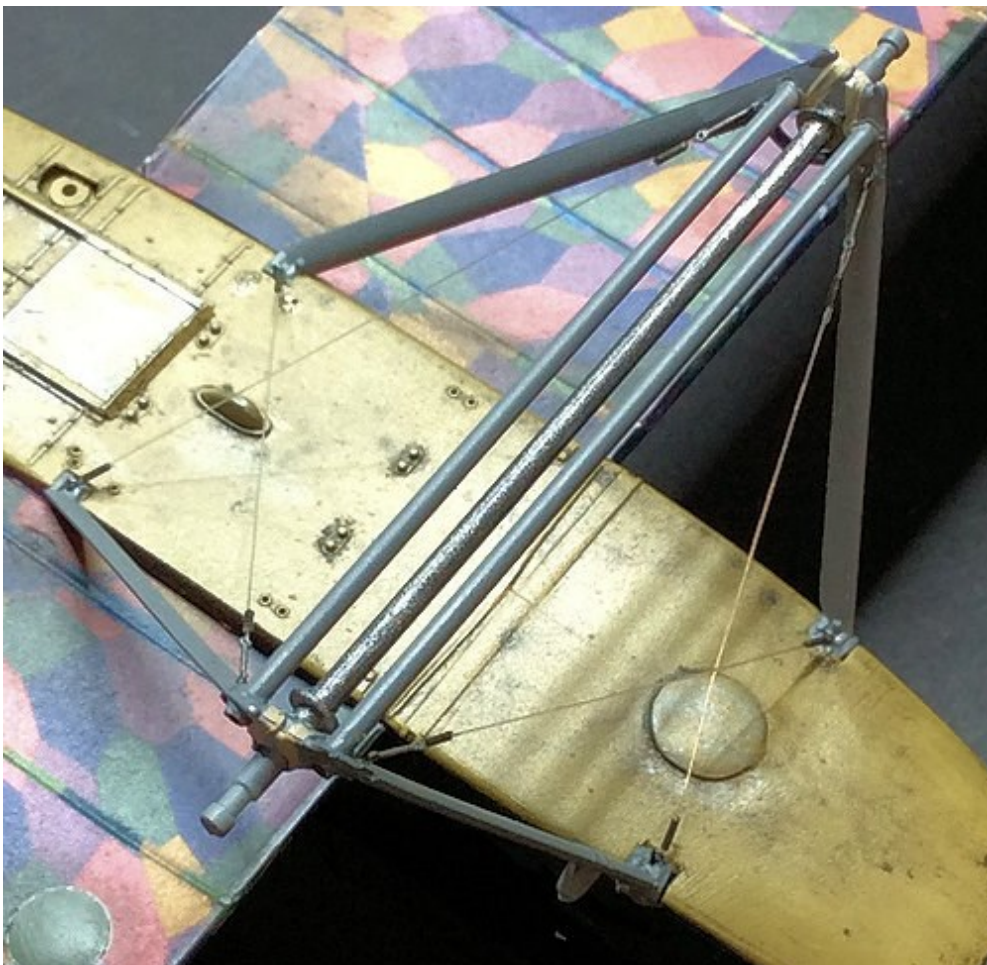
Holding the ends of the 0.08mm diameter line taut, slide the Type C turnbuckle up to the inner edge of the strut, then keeping that line taut, slide the tube up to the turnbuckle.

Using thin CA adhesive, secure the 0.08 mm diameter line in the strut and the turnbuckle line in the tube.

Cut away any residual line at the end of the turnbuckle tube and at the outer edge of the strut.

Repeat the procedure the attach the remaining three bracing wires to the landing gear.

Brush paint the turnbuckles with 'Mr. Colour' Stainless Steel (213) or similar.

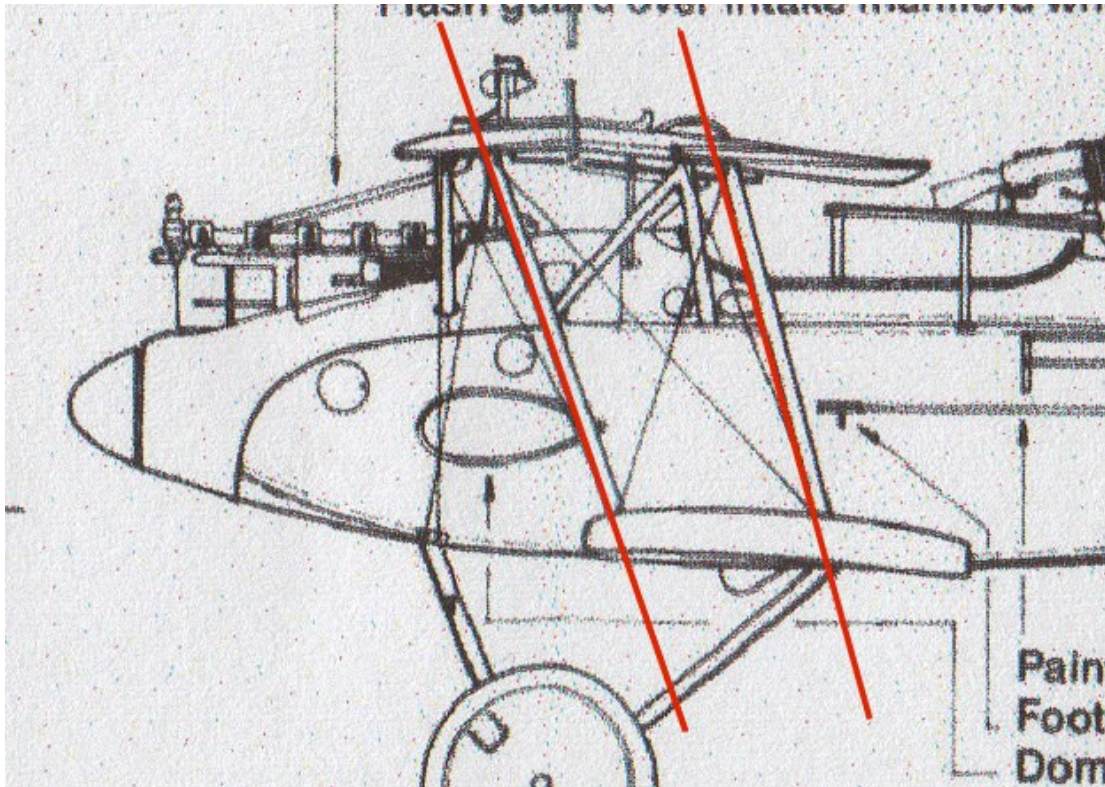


**Assembly (continued):**

Cement the rear left side cabane strut (A72) into its locating recesses in the left side of the fuselage. Make sure the strut fully locates into its recesses and is vertical when viewed from the front.

Cement the rear right side cabane strut (A69) into its locating recesses in the right side of the fuselage. Make sure the strut fully locates into its recesses and is vertical when viewed from the front.

**NOTE:** *The front interplane struts, when fitted, lean slightly further forward at their tops than the rear struts. The front and rear struts are not parallel to each other.*



Cement the two left side interplane struts into their locating holes in the left underside of the upper wing. The front strut is (A17) and the rear strut is (A3).

Cement the two right side interplane struts into their locating holes in the right underside of the upper wing. The front strut is (A17) and the rear strut is (A3).

Make sure the four struts are aligned when viewed from the sides of the upper wing.

**NOTE:** *The two forward cabane struts (A79, A81) and the two radiator coolant pipes (D10, F11) will be fitted after the upper wing has been finally fitted.*

Lower the upper wing down towards the lower wings and carefully locate the bottom of the four interplane struts into their lower wing locating recesses. Also locate the tops of the fitted rear fuselage cabane struts into their locating holes in the underside of the upper wing.

Check that the struts are fully located into their recesses and holes and that the interplane and cabane struts are vertical when viewed from the front.

Check that the upper and lower wing are parallel to each other when viewed from the sides.

Cement the four interplane struts into their lower wing recesses and the two cabane struts into their holes in the underside of the upper wing.

Once the upper wing is set in position on its struts, slide the forward, left cabane strut (A81) into its fuselage opening and locate its top into its locating recess in the underside of the upper wing. Cement the cabane strut in position at the fuselage and underside of the upper wing. Repeat the procedure to attach the forward, right cabane strut (A79). Cement the fin into its locating slot and hole in the top, rear of the fuselage.



**NOTE:** When fitting the radiator pipe D10, you may need to cut away the engine end of the pipe to enable it to be located. That end of the pipe can't be seen anyway once the pipe is fitted.

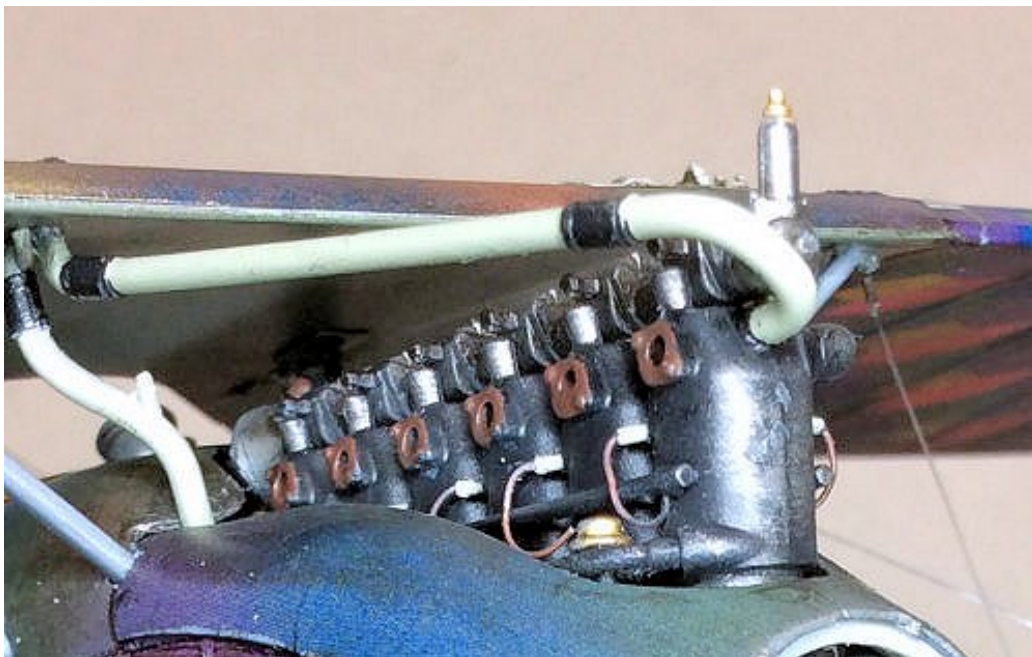
Locate radiator pipe D10 into the engine bay and the rear locating slot at the edge of the radiator on the underside of the upper wing.

Cement radiator pipe D10 in position.

Use a 1.0 mm diameter drill to open up the locating hole in the front engine cylinder for radiator pipe F11.

Locate radiator pipe F11 into its locating hole in the engine front cylinder and the front locating slot at the edge of the radiator on the underside of the upper wing.

Cement radiator pipe F11 in position.



Refer to Part 3 (Weathering) of this build log for more information. I applied 'Flory Models' Dark Dirt fine clay wash over the radiator pipes, landing gear and fuselage cabane struts.



## **Final rigging (continued):**

### **Example of final structural rigging:**

**NOTE:** *The turnbuckles used are the 'Gaspach' metal 1:32nd scale (**One-Ended**). Always cut the length of line **much longer** than needed to span between its final attachment points.*

*Refer to Part 6 (Rigging) of this build log for more information*

Using the example at the beginning of Part 12 of this build log, attach a 'Gaspach' metal 1:32nd scale turnbuckle (**One-Ended**) to the free end of a pre-rigged line. Leave the line loose in the turnbuckle.

Locate the tang of the turnbuckle into the lines relevant pre-drilled hole in the model part.

Check that the turnbuckle will be aligned to the line (when tightened) and if necessary, carefully bend the inserted turnbuckle to achieve alignment.

Using thin CA adhesive secure the turnbuckle into its location hole making sure it's correctly aligned.

Pull on the end of the line from the turnbuckle tube to keep the line taut and slide the tube up to the turnbuckle.

Using thin CA adhesive, secure the line in the tube.

Cut away any residual line at the end of the tube.

### **Structural rigging:**

Use the above procedure to attach each of the pre-rigged lines to their turnbuckle rigging points on the lower wings and fuselage. **Attach the lines in the following order:**

1. Incidence wires (diagonally crossed between the interplane struts).
2. Flying wires (rear only)
3. Landing wires (front and rear)
4. Drag wires:

**NOTE:** *The drag wires should be fitted before the front flying wires, as otherwise access will be restricted.*

Drill a hole of 0.3 mm diameter across and through the top of the two fuselage front cabane struts.

Using the example at the beginning of Part 12 of this build log, attach a 'Gaspach' metal 1:32nd scale turnbuckle (**One-Ended**) to the free end of two 0.12 mm diameter mono-filament lines, such as that from 'Steelon' or 'Stroft GTM'. Leave the lines loose in the turnbuckles.

Slide a blackened 0.4mm diameter Brass tube, such as 'Albion Alloy's' MBT04 or similar, over the free end of the lines.

Pass the free ends of the lines from outboard and through the pre-drilled hole in the front cabane struts.

Locate the tangs of the turnbuckles into the rear pre-drilled holes in the top of the landing gear forward struts.

Check that the turnbuckles will be aligned to the lines (when tightened) and if necessary, carefully bend the inserted turnbuckles to achieve alignment.

Using thin CA adhesive secure the turnbuckle into its location hole making sure it's correctly aligned.

Pull on the free end of the lines to keep the lines taut and slide the 0.4 mm diameter tubes up to the top of the cabane struts.

Using thin CA adhesive, secure the line and tube at the top of the cabane strut.

Cut away any residual line at the end of the turnbuckle tubes and the inboard side of the cabane struts.

**5. Flying wires (front)** - using the previous example for 'final structural pre-rigging', attach the two pre-rigged front flying wires into the front pre-drilled holes in the top of the landing gear forward struts.

**6. Fuselage cabane strut bracing wires:**

**NOTE:** *During the following steps its best to work through the side of the fuselage cabane struts.*

Using fine straight tweezers, pass the fuselage cabane strut bracing lines through the pre-drilled holes in the top decking panel, forward from the pilots cockpit.

Holding the lines taut, secure them at the holes using thin CA adhesive.

**7. Rudder control cables:**

Locate the bottom rudder post into its locating hole in the top of the fuselage at the rear of the fin.

Locate the rudder to its hinges at the rear edge of the fin.

Cement the rudder in position.

Cut the length of the rod (fitted in the turnbuckle of a control pre-rigged line), such that when it is inserted into the pre-drilled hole in a rudder control horn, it does not protrude from the horn.

With the turnbuckle inserted in the control horn. Pass the free end of the line into its exit slot in the top, rear of the fuselage at the side of the fin.

Using thin CA adhesive, secure the turnbuckle to the control horn and the line in the exit slot, keeping the line taut.

Repeat the procedure to attach the opposite control line.

**8. Elevator control cables:**

Repeat the previous procedure to attach the two upper and two lower elevator control lines to their elevator control horns and exit slots in the top and underside of the fuselage.





#### Rigging tensioning:

**WARNING:** *Care needs to be taken when using this method to tension line, as using a heat source is required.*

Invariably after rigging has been completed, some lines may be slack. This can be remedied by careful application of heat along the line, but should only be carried out once all rigging has been completed. Only then will you be able to see which lines require additional tensioning.

**NOTE:** *Take care not to linger at one area of a line with the heat source as this will melt the mono-filament causing the line to break. Also take care not to touch any part of the model or any other rigging, as this will also cause damage through melting.*

Carefully move a suitable heat source (I use a small electrical soldering iron) close to and along the slack line, keeping the heat source always moving. You will see the line tension as the applied heat takes effect, shrinking the line.

#### **Assembly (continued):**

Fully locate the 'Proper Plane' inner wheel covers into the 'Proper Plane' tyres (into the deeper recess).

Using thin CA adhesive, secure the covers in the tyres (from the inside).

Locate the tyre assemblies fully onto the ends of the landing gear axle.

Clip the wheel retainers (A1) fully onto the recesses in the ends of the landing gear axle.

Using thin CA adhesive, secure the retainers to the inside of the wheel covers and axle.

**NOTE:** *During the following step, I found it necessary to scrape away the raised locating Shoulder from inside the wheel outer covers and also cut away the end of the landing gear axle. This was required due to the differences between the kit supplied and 'Proper Plane' wheels.*

Fully locate the kit wheel outer covers into the outer recesses of the 'Proper Plane' tyres and secure in position using thin CA adhesive.

Cement the observers gun mounting ring assembly onto its three point fuselage mounting locations.

Cement the two side supports (A57) into their locating holes at the top edge of the fuselage and the recesses under gun mounting ring.

Cement the fuel tank sight glass (C2) into its two locating holes in the upper wing fuel tank.

**NOTE:** *During the following step, take care when fitting the parts as they can easily be broken.*

Locate the two aileron control bell-cranks into their upper wing slots and through their openings in the fuselage. They should be in the same positions if the ailerons are aligned to the upper wing.

Using CA adhesive, secure the propeller assembly onto the engine propeller shaft, making sure the rear of the spinner is close to, but not touching, the front of the fuselage.

Locate the two ailerons onto the upper wing, using the added locating rods.

Cement the ailerons to their hinges on the upper wing.

Locate the Parabellum machine gun into its mounting and rest. The forward underside of the gun breech block locates between the two 'arms' of the mounting and the shoulder butt in the rest.

Secure the gun in position, using thin CA adhesive in the rest and mount.



**NOTE:** *During the following steps its best to work through the side of the fuselage cabane struts.*

Apply a small amount of PVA adhesive, such as 'Microscale' Kristal Klear' or similar, in front of the two instruments on the top decking panel in front of the cockpit.

Using fine straight tweezers, position the windscreen (C1) onto the PVA adhesive and over the two instruments. The rear corners of the windscreen should be close to the cockpit surround padding.

Cement the wireless aerial (A39) into its locating hole in the right, underside of the fuselage.  
Using thin CA adhesive, secure the flare ammunition rack to the right side of the fuselage.



Using thin CA adhesive, secure the 'Grantenwerfer 16' grenades rack to the left side of the fuselage.



Cut a short and narrow length of photo-etch.

Anneal (soften) the photo-etch by moving it across a flame, such as that from a cigarette lighter, until the colour darkens slightly.

Lay the flare pistol on a flat surface and bend the photo-etch strip over the barrel to form a support bracket.

Using thin CA adhesive, secure the flare pistol into the created support bracket.

Using thin CA adhesive, secure the flare pistol/support bracket onto the right side of the fuselage, just forward from the observers cockpit.

Cement the exhaust manifold into its locating holes in the left top of the engine cylinders.



**Weathering:**

Check the completed model for any parts or areas that still require weathering.

Refer to Part 3 (Weathering) of this build log for more information. If necessary, apply weathering. I applied 'Flory Models' Dark Dirt fine clay wash over the model parts.

**Final finish:**

To seal in applied weathering and to reduce the sheen of the mono-filament used for rigging the model, airbrush a light coat of a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar, over the model and its rigging.

# PART 14

# FIGURES

## PART 14 - FIGURES

**NOTE:** *The figures I chose to use for this model are the 'Model Cellar' WW1 German two seater crew (MC32016).*

*Refer to Part 5 (Resin) for more information when working with resin parts.*

*The figures are supplied already separated from their casting blocks.*

Observer



Pilot

### **Preparation of figures:**

Sand and the bottom of the feet on both figures, to remove residual moulding block resin.

Check the figures for any resin flash or seams. If found, remove by either sanding or scraping.

Check that the figure arms, legs and heads locate fully into their respective bodies and if necessary, adjust the parts to achieve this.

### **Observer figure:**

**NOTE:** *The observer figure consists of a body, two arms and the head.*

#### Assembly:

Using thin CA adhesive, secure the left and right arms into their recesses in the figure body.

Using thin CA adhesive, secure the head into its recess in the figure body.

Drill a hole of 0.8mm diameter up into the left leg of the figure, making sure the hole is drilled centrally up into the leg (to avoid the drill breaking through the side of the leg).

Cut a length of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using thin CA adhesive, secure the rod into the pre-drilled holes in the leg. This will be used to both hold the figure whilst painting and to mount the figure into the base of the display case.

#### Painting:

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Brush paint the figure as follows with these paints or similar colours:

**Jacket** - 'Tamiya' Neutral Grey (XF53) with mixed Rubber Black (XF85) as shadows. Add a small amount of 'Tamiya' acrylic paint retarder to the paints to slow drying time.

**Protective leggings** - 'AK Interactive' Brown Leather (AK3031) mixed with German Uniform Base (AK3091) for shadows. Fur edges British Uniform (AK3081).

**Helmet** - 'AK Interactive' Brown Leather (AK3031) darkened slightly with German Uniform Base (AK3091).



**Shoes** - 'Tamiya' Red Brown (XF64) with a small amount of 'Tamiya' acrylic paint retarder to slow drying time.

**Scarf** - 'Tamiya' Red (X7) with a small amount of Rubber Black (XF85) to darken.

**Goggles** - 'Tamiya' Red Brown (XF64). Lenses 'Mr. Colour' Stainless Steel (213) covered with 'Tamiya' Clear Yellow (X24).

**Buttons** - 'Mr. Colour' Brass (219).

**Flesh** - 'Vallejo' Model Colour Base Skintone (70.815), Light Flesh (70.928) highlights and Rojo Beige Red (70.804) shadows.

**Eyes-eyebrows** - 'Tamiya' Gloss Black (X1).

### **Finish and weathering:**

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows, pockets and on wear areas of the trousers.

Brush the helmet with 'Tamiya' Smoke (X19) mixed with semi-Gloss Clear (X35).



### **Pilot figure:**

**NOTE:** *The pilot figure consists of the body, two legs, right arm, head and the helmet.*

### **Assembly:**

#### **Legs:**

**NOTE:** *The following 'optional' steps are to add extra support for attaching the legs to the figure.*

Drill a hole of 0.8mm diameter up into the underside of the body in the centre of the two locating recesses for the legs.

Drill a hole of 0.8mm diameter down into the centre of the top of each leg, making sure the drill does not break through the side of the legs.

Cut two lengths of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using thin CA adhesive, secure a rod into the pre-drilled holes in the legs.

Test fit each leg into its pre-drilled hole in the figure body. Make sure the leg fully locates and is at the correct position. If necessary bend the rod in the leg to achieve this.

Using thin CA adhesive, secure the two legs into the figure body.

#### Remaining parts:

Drill a hole of 0.8mm diameter up into the centre of either leg, making sure the drill does not break through the side of the legs.

Cut a length of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Use thin CA adhesive, secure the rod into the pre-drilled holes in the leg. This will be used to both hold the figure whilst painting and to mount the figure into the base of the display case.

Using thin CA adhesive, secure the right arm into its recess in the figure body.

Using thin CA adhesive, secure the head into its recess in the figure body.

Using thin CA adhesive, secure the helmet onto the head.

#### Painting:

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Brush paint the figure as follows with these paints or similar colours:

**Coat** - 'Tamiya' Neutral Grey (XF53) with mixed Rubber Black (XF85) as shadows. Add a small amount of 'Tamiya' acrylic paint retarder to the paints to slow drying time.

**Coat collar** - 'Tamiya' Desert Yellow (XF59) with Deck Tan (XF55) highlights.

**Trousers, jacket collar and puttees** - 'AK Interactive' German Uniform Light (AK3092) mixed with German Uniform Base (AK3091) for shadows.

**Helmet** - 'AK Interactive' Brown Leather (AK3031) darkened slightly with German Uniform Base (AK3091).

**Shoes** - 'Tamiya' Red Brown (XF64) with a small amount of 'Tamiya' acrylic paint retarder to slow drying time.

**Gloves** - 'Tamiya' Red Brown (XF64).

**Goggles** - 'Tamiya' Red Brown (XF64). Lenses 'Mr. Colour' Stainless Steel (213) covered with 'Tamiya' Clear Yellow (X24).

**Buttons** - 'Mr. Colour' Brass (219).

**Jacket collar decoration**- 'Mr. Colour' Stainless Steel (213)

**Flesh** - 'Vallejo' Model Colour Base Skintone (70.815), Light Flesh (70.928) highlights and Rojo Beige Red (70.804) shadows.

**Eyes-eyebrows** - 'Tamiya' Gloss Black (X1).

#### Finish and weathering:

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows, pockets and on wear areas of the trousers.

Brush the helmet with 'Tamiya' Smoke (X19) mixed with semi-Gloss Clear (X35).



# PART 15

# DISPLAY BASE

## **PART 15 - DISPLAY BASE**

The display case is made from two sheets of 3mm thick Piano Black Acrylic sheet cemented together with a transparent top fabricated from 3mm thick Clear Acrylic sheet. This was custom made for me by Paul Moss at 'Inperspective' (Ebay). The name plaque was also made by an on-line retailer 'The Engraving Shop'.

The grass mat was cut to shape from a sheet of 'Lars op't Hof' Scenery (Pasture Summer Long).

The cut mat was then positioned on the base and the model and figure test placed to achieve the best effect and to make sure the transparent cover of the case would be able to be located without touching the model. The model and figure were then removed with the grass mat left in position on the display base. The edges of the grass mat were then carefully lifted and a soft marker pen was used to mark the outline of the grass mat, but approximately 5mm inside the mat edge. The grass mat was then removed and the area of the display base inside the marks was scuffed using a coarse grit sand paper, in order to give a key for the adhesive.

**NOTE:** *When applying the adhesive, make sure it is not applied too thickly and close to the edges of the finally positioned grass mat. Otherwise the adhesive may be squeezed out from under the grass mat once weight is applied to hold down the mat during setting of the adhesive.*

A coat of PVA adhesive (white glue) was applied to the scuffed area on the display base and to the back of the grass mat. The grass mat was then laid onto the PVA adhesive and positioned correctly. Light pressure was applied to ensure the mat was in contact with the adhesive.

Finally an acrylic plaque stand was positioned to the left, front corner of the display base (just in from the edges of the shoulder for locating the transparent acrylic cover. The area on the underside of the stand and its contact are on the display base were scuffed using a coarse grit sand paper, in order to give a key for the adhesive. A thin coat of contact adhesive was then applied to both scuffed areas and once the adhesive started to set, the stand was carefully position onto the display base and pressed down to make full contact. The self-adhesive backed information plaque was the positioned onto the stand and pressed to make full contact.

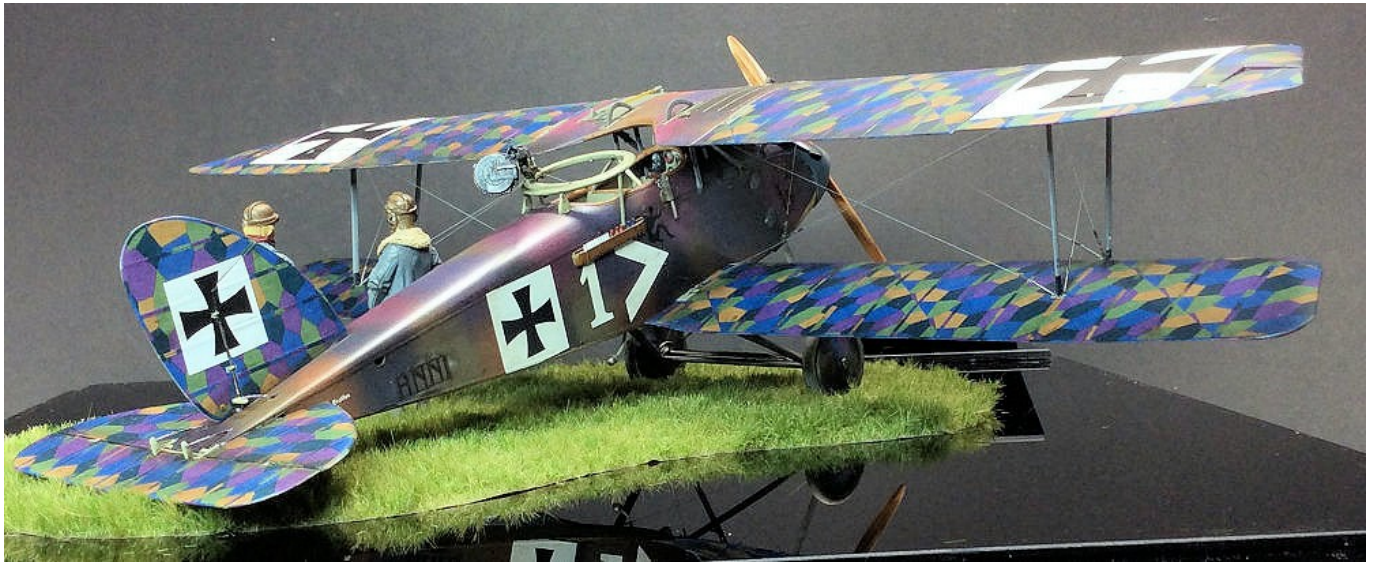
The model and figure were then positioned on the base in their final positions and the support pin for the pilot figure marked into the grass mat. A hole of 1.0mm diameter was then drilled through the grass mat and into, but not through, the base. The hole was cleared of residual acrylic to ensure the pin in the figure would fully locate. The figure was then test fitted and where necessary, the support pin for the figure was snipped to the required length to fully locate into the display base.

**NOTE:** *The aircraft model is not secured to the display base as this can cause shock damage to the model if the display is transported to shows etc. For that the aircraft model would be packed separately for transporting.*

Thin CA adhesive or PVA adhesive was then applied to the support pin of the pilot figure, which was then located, in the desired position, into the pre-drilled location hole. The mechanic figure was secured in position standing on the wheel, using thin CA adhesive. The aircraft itself, being light in weight, will tend to sit on top of the grass on the mat, rather than seat fully down, as would a real aircraft. Therefore the location of the aircraft wheels and tail skid were marked onto the grass mat and those areas scrapped through the mat to create slight and unobstructed troughs, into which the aircraft could be located.

**PART 16**  
**COMPLETED**  
**MODEL**  
**PHOTOGRAPHS**



















**END**