



# 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 Hannover CI.II.

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*Completed: April 2023*

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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**

'Kellerkind Miniaturen' German mechanic and dog (54105).

### **Propeller**

'Proper Plane' Reschke propeller (WP-032).

### **Weapons**

'Gaspatch' Parabellum 14/17 resin machine gun,  
'Master' Spandau LMG 08/15 barrel and jacket (AM-32-023).

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

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

### **Photo-etch**

'PART' 1:48th scale control horns (PRT-S48-087).

### **Decals**

'Aviatic' Linen Weave Effect (ATT32236).

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

Paints ('Tamiya' Acrylic, 'Humbrol' Acrylic, 'Mr. Metal Colour', 'Citadel'),  
'AK Interactive' Primer and micro-filler (Grey AK758, White AK759),  
'AK Interactive' figure paints, Kerosene wash (AK-2039), Engine Oil (AK-2019),  
'Alclad II' Lacquers, 'Alclad' Aqua Gloss 600, 'Mr. Colour' Levelling Thinners,  
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, 'Mr. Surfacer 500, 1000, 1200',  
'Tamiya' liquid cement or 'Plastic Magic' liquid cement,  
'Revell' Contacta Professional cement (39604), 'Citadel' paints range,  
'PlusModels' lead wire, 'Hataka' Orange line paint,  
'Windsor & Newton' Griffin Alkyd paints, 'Blacken-It' solution,  
'MFH' black 0.4 mm diameter tube (P961), 'Plastruct' styrene rod.

### **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,  
'Polak' Wild Meadow - variation E (4705).

# THE AIRCRAFT



## THE AIRCRAFT

**This model represents Hannover CI.II, Serial No.690/18 of FEA 8 (Fliegerersatz Abteilung 8), based at Graudenz (now Grudziadz in Poland) in late 1918.**

### References:

'Wingnut Wings' instruction manual.

'Windsock' date file No.23 - Hannover CI.III (P.M. Grosz).

Centenary Data File 168 - 'HAWA' Volume 1 (Ray Rimell and Harry Woodman).

Centenary Data File 169 - 'HAWA' Volume 2 (Ray Rimell and Harry Woodman).

Colour profiles by 'R.N. Pearson'.

On-line resources (various).

### General:

**NOTE:** *The following 'General' text was copied from the 'Wingnut Wings' instruction manual.*

The highly distinctive Hannover CI.II was an excellent low level two-seat escort fighter and ground attack aircraft. Hannoversch Waggonfabrik AG (Hawa) manufactured railway carriages before branching out and building aircraft under license for Aviatik, Rumpler and Halberstadt. Hawa delivered their first license built aircraft in early 1916 but by the end of that year they had begun to design their own aircraft to Idflieg's new lightweight C class (C = armed two-seat) specifications. The result was the Hannover CI.II (the 'I' stands for leicht - lightweight)

Prototype, which first flew in July 1917 with production aircraft reaching front line units the following month. Powered by a 180hp Argus As.III engine, the new 'battle plane' was well received as it was strong, fast, light weight and in certain circumstances could outmanoeuvre allied fighters. The high position of the crew gave them an excellent field of vision unobstructed by the top wing, and the innovative biplane tailplane increased the observer's field of fire rearwards. Depending on mission requirements, the Hannover CI.II could carry various models of camera and wireless equipment as well as small bombs.

Although the Hannover CI.II was gradually replaced by the improved CI.III & CI.IIIa from the middle of 1918, they continued to serve at the front until the armistice. Additionally 200 CI.II aircraft were manufactured by Roland during 1918, these aircraft primarily serving with training units. A few Hannover CI.II and CI.IIIa continued to serve post war in the Polish and Latvian air services.

### Construction:

The unusually deep Hannover CI.II wooden frame fuselage was skinned with 1.6mm plywood (thinner than the fuselage wall thickness of this model) and then given a layer of doped on fabric for additional strength. But the most distinctive feature of the CI.II was the biplane horizontal tailplanes. The wing panels were of conventional construction being made of wood and covered in fabric while the elevators, ailerons and top horizontal tailplane were constructed from welded steel tubing covered in fabric. The top wing centre section and the bottom horizontal tailplane were constructed from wood like the wings, but were skinned with 1.6mm plywood. The wing and undercarriage struts were steel tubes with wooden fairings wrapped in fabric.

Hannover CI.II interior fuselage colours are thought to be dark varnished wood with metal brackets and fittings finished in grey-green. The fabric areas of the wings and tailplane were covered with 4 and 5 colour lozenge with rib tapes cut from the same material or plain linen. The top wing centre section, wing struts, ply covered bottom horizontal tailplane and rear of the fuselage were painted to approximate the fabric lozenge shapes and colours using both matt and gloss paints. It appears that larger freehand lozenge patches were hand painted or sprayed over the rest of the fuselage which were in turn frequently over sprayed with camouflage colours to tone them down considerably.

Period reports and factory documents refer to Hannover fuselage colours of 'black', 'blue' and 'generally dark green'. The use of a transparent dark 'Prussian blue' glaze sprayed over the lozenge patches on the fuselage would achieve any, and perhaps all, of these results depending on the intensity of the underlying colours and the opacity of the glaze. Additionally many colourful unit and personal markings were applied.

### **General specifications:**

Wingspan - 32.2 ft (11.95m)

Length - 25.59ft (7.8m)

Maximum weight - 2,546lb (1,155kg)

Maximum speed - 96mph (155kph)

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

Engine - Argus As.III (180hp)

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

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

Bomb load - Small bombs and grenades

Production - 646 between August 1917 and mid 1918.

### **Hannover Cl.II, Serial No.690/18:**

This particular aircraft was manufactured by sub-contractor Roland, as denoted by the 'Rol' as part of the aircraft serial number on the fuselage sides. It was based in Graudenz (now Grudziadz in Poland) and operated as a training aircraft at the flight school FEA 8 (Fliegerersatz Abteilung 8).

To preserve precious paint supplies, training aircraft were not camouflaged and often had Clear Doped Linen (CDL) covered wing surfaces with white or very pale blue painted fuselages. While other Roland built Hannover Cl.II aircraft had CDL or bleached linen covered wings, this particular aircraft appears to have received an overall coat of opaque pale blue, although the wing struts, wheels, rudder and centre section of the upper wing appear to be white. All metal panels appear to be grey-green. The red bordered black/white' quartered fuselage marking represents the observer badge. The equipment fitted to the aircraft depended on the type of training flight to be carried out. This could be such as wireless sets, cameras, and Machine guns. Late production Roland built Hannover Cl.II that were ordered in February 1918 (batch 500/18 to 699/18), featured the longer rear tailplane bracket normally associated with the Cl.III and Cl.IIIa and factory applied post June 1918 style 'Balkenkreuz'.

Operationally, these aircraft were used in the Schlachtstaffeln ('Schlastas'), which were specialized fighter/bomber squadrons in the German 'Luftstreitkräfte' during World War One. Their primary function was in close ground support.





# PART 1 MODEL KIT

## **PART 1 - MODEL KIT**

(‘Wingnut Wings’ - Kit No:32024)

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://archive.aeroscale.net/review/8531/index.htm>

### **The model:**

The aircraft being modelled is based on the colour profiles on page 23 of the kit instruction (Scheme D).

### **Decals:**

The decal sheet provides the markings required for the aircraft being modelled. I chose to replace the kit supplied lozenge decals with the equivalent decal sheets from ‘Aviatic’.

‘Aviatic’ 5 colour lozenge upper surfaces (ATT32016)

‘Aviatic’ 5 colour lozenge lower surfaces (ATT32018).

### **Propeller:**

The kit supplied propellers represent types manufactured by either ‘Niendorf’, ‘Germania’ or ‘Reschke’. As there are few photographs or information on this particular aircraft, any of these kit supplied propellers could be used.

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

### **Weapons:**

The kit supplied Parabellum and parts of the Spandau machine guns will be replaced with the ‘Gaspach’ Parabellum 14/17 resin machine gun and the ‘Master’ Spandau LMG 08/15 barrel and jacket (AM-32-023).

### **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:

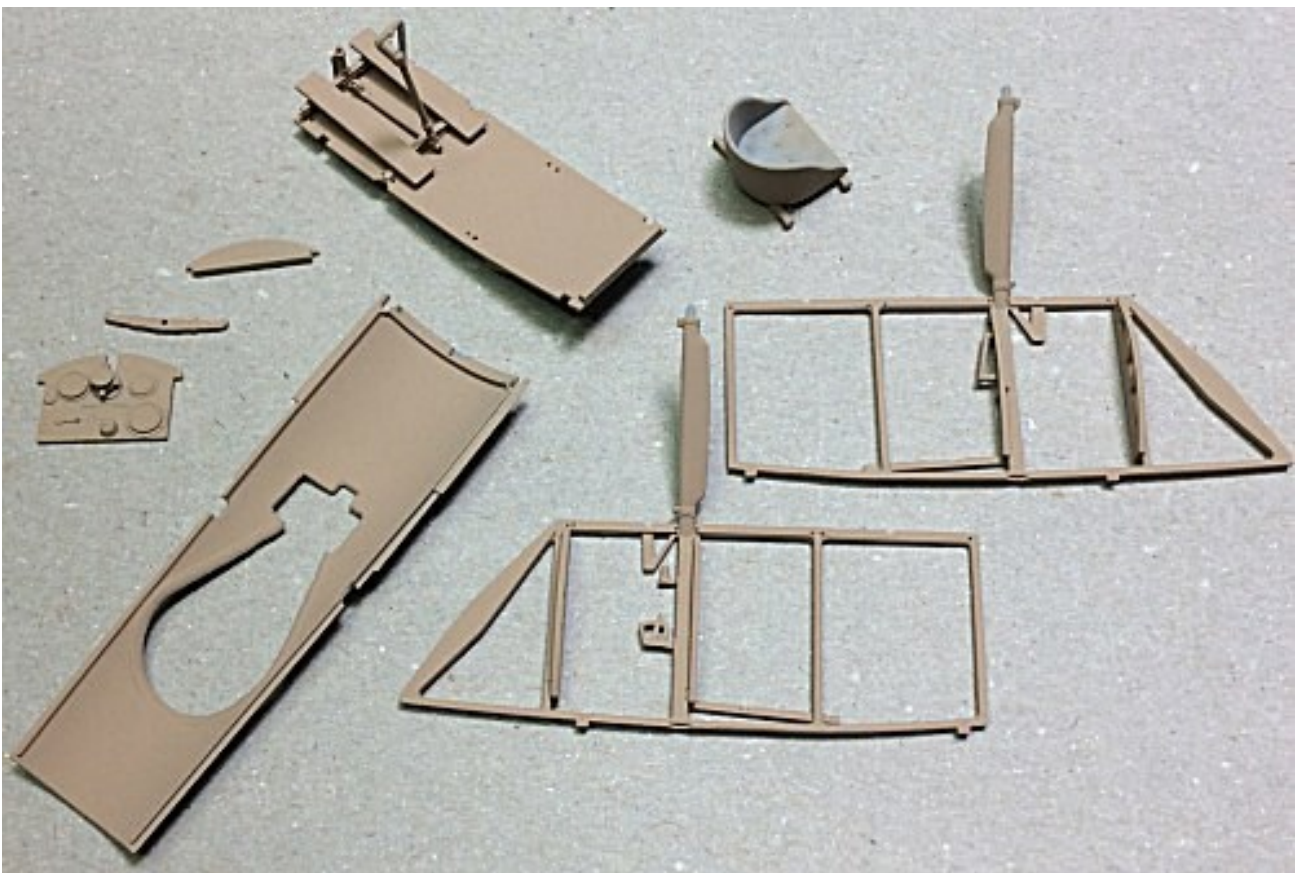
Parts of the model that are supposed to be made of wood can prove to be a challenge to replicate a wood finish to the part. Some after market companies produce accurate wood decals, which can be used to cover larger areas, such as cockpit decking and fuselage panels. However, decals can't easily be used 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.

**NOTE:** *If using 'Tamiya' X20A to conform decals, apply sparingly. If too much is applied the decal is liable to melt.*

Where decals cover location holes or other openings, prick or cut through the decal into the hole or opening then apply 'Tamiya' X20A thinners **sparingly**, 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.

'Windsock' date file No.23 - Hannover Cl.III (P.M. Grosz).

Centenary Data File 168 - 'HAWA' Volume 1 (Ray Rimell and Harry Woodman).

Centenary Data File 169 - 'HAWA' Volume 2 (Ray Rimell and Harry Woodman).

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 6 and 17 in the 'Wingnut Wings' instruction manual.*

### **Flight controls**

**NOTE:** *It's not detailed as to how the various flight controls cables were configured. The following descriptions are my 'best guess'.*

#### **Rudder cables:**

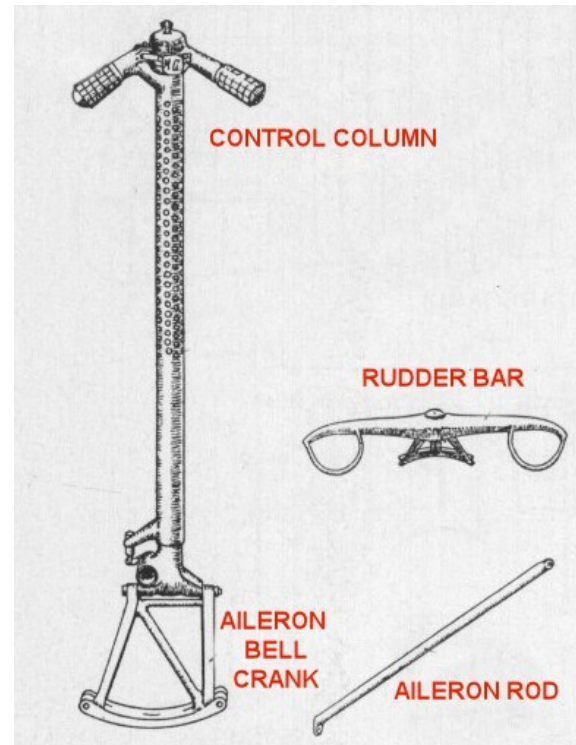
**NOTE:** *Inside the fuselage, only the rudder control cables in the pilots cockpit will be visible.*

A rudder control cable was routed around a curved guide at the bottom of the rudder bar. The two cable ends were routed rearwards in the pilots cockpit and around pulleys then through the fuselage to exit at the fuselage rear sides. The cable ends were attached to the end of a rudder control horns on 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.



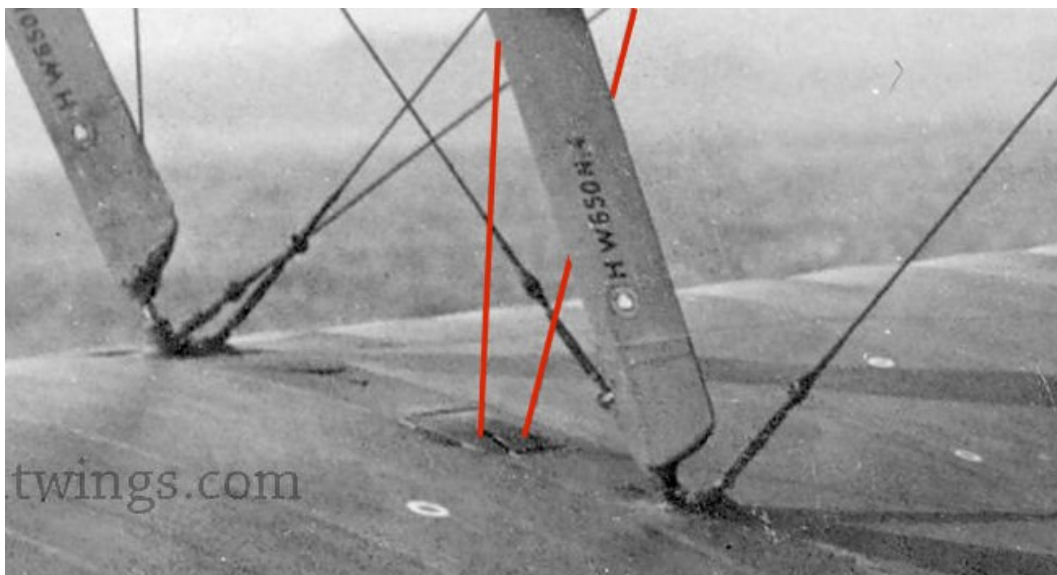
This movement of the rudder caused the aircraft to yaw in the required direction. Adjustable turnbuckles were likely fitted to the cables at the rudder control horns.

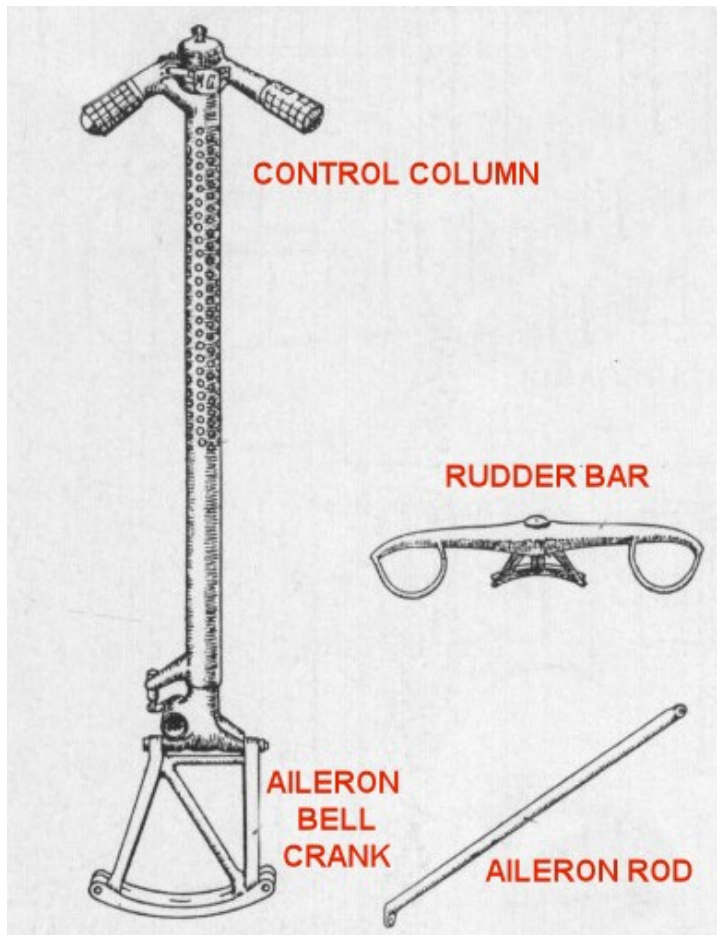


Aileron control:

**NOTE:** *The controls and cables for the ailerons were beneath the cockpit floor and inside the lower wings. The model does not provide for these parts as they would not be seen anyway. As such, no fuselage controls are necessary for the ailerons.*

Aileron control was effected by a double end bell crank attached to the bottom of the control Column and pulleys. Each end of the bell crank was attached to a control cable, which were routed outboard to the pulleys inside of the lower wings. The control cables exited the top of the lower wings and were routed up to the upper wing. One cable was attached to the aileron operating bell crank and the other cable was attached to the inboard end of the aileron. The return cables were routed around pulleys at the control column. As the pilot moved the control column left or right, the cables would move the two ailerons in the upper wing in opposite directions, causing the aircraft to bank (roll) in the required direction.





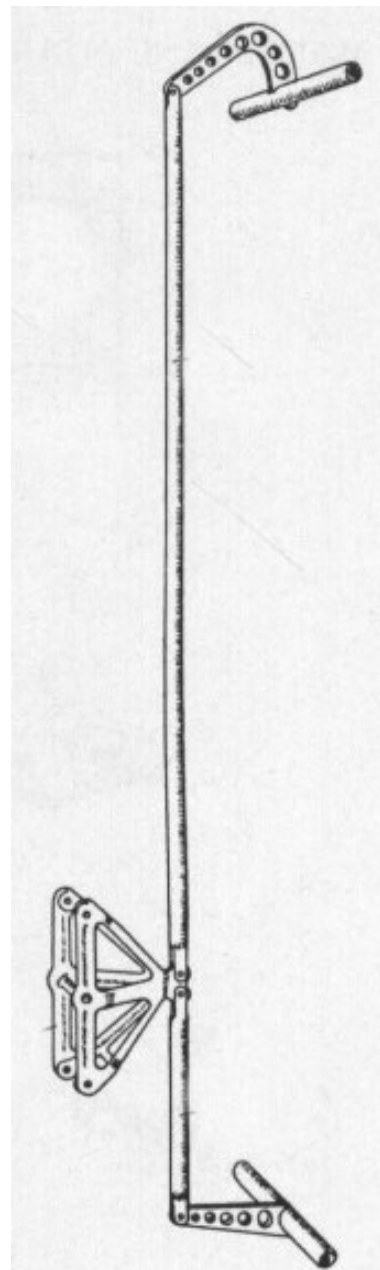
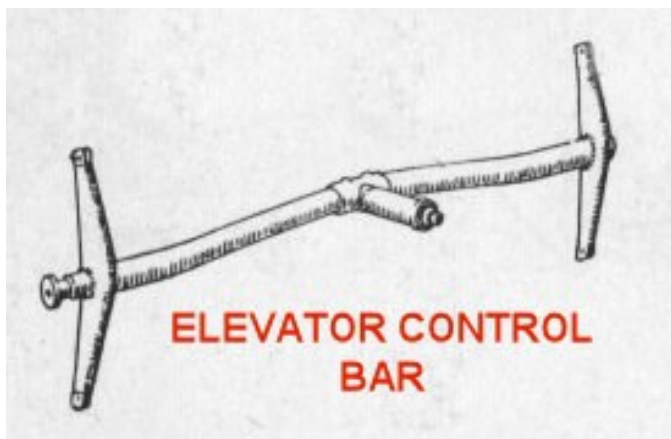
## Elevator cables:

**NOTE:** *Inside the fuselage, only the upper elevator control cables in the pilots cockpit will be visible.*

The elevator control cables were attached to control horns located at the ends of the elevator control bar. This was attached to the bottom of the control column. An upper and lower cable was attached to the top and bottom ends of both control horns. These cables were routed rearwards beside the pilots seat and through the rear cockpit and the rear of the fuselage. There the upper cables were attached to a triangular bell crank located low on the vertical control bar in the fin. The lower control cables were attached to the bottom of the bell crank. The top of the control bar was attached to the forward end of the upper elevator bell crank and the lower attached to the lower elevator control horn.

As the pilot moved the control column forwards or rearwards, the upper or the lower pair of control cables would either tension and move the control bar in the fin up or down. This caused the elevator control horns to lift or lower the elevators in unison. The movement of the elevators caused the aircraft to climb or dive (pitch) in the required direction.

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





## **Structural rigging**

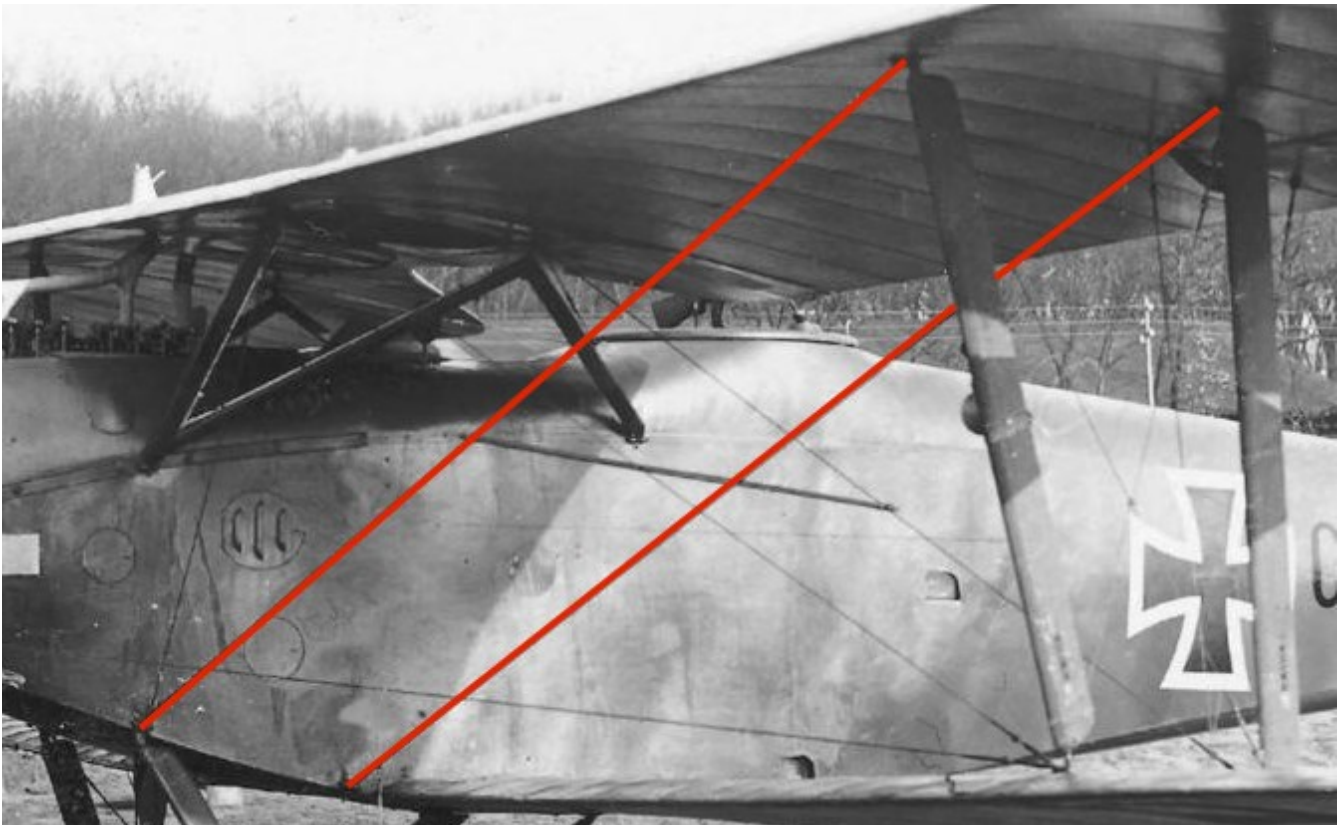
### **Flying wires:**

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, forward from leading edge of the lower wings and was 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.



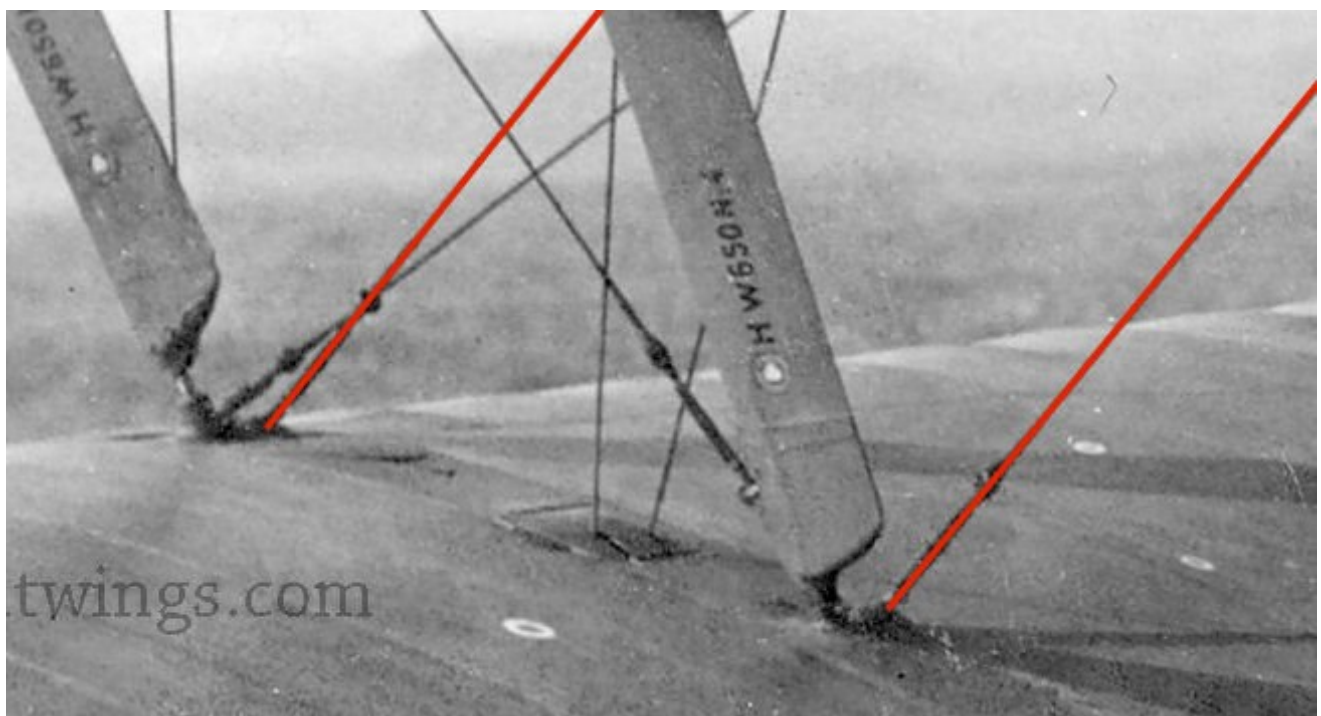
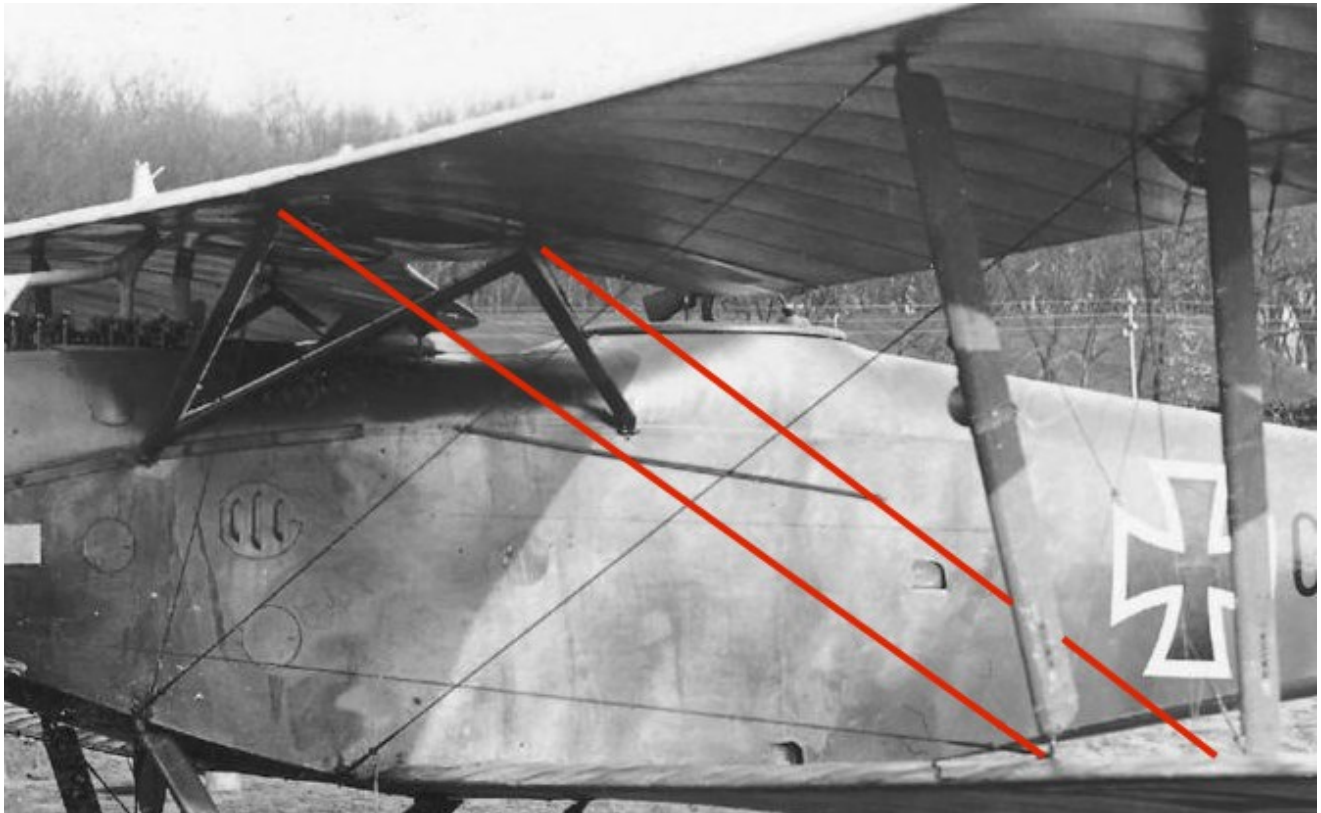
### **Landing wires:**

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.



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.



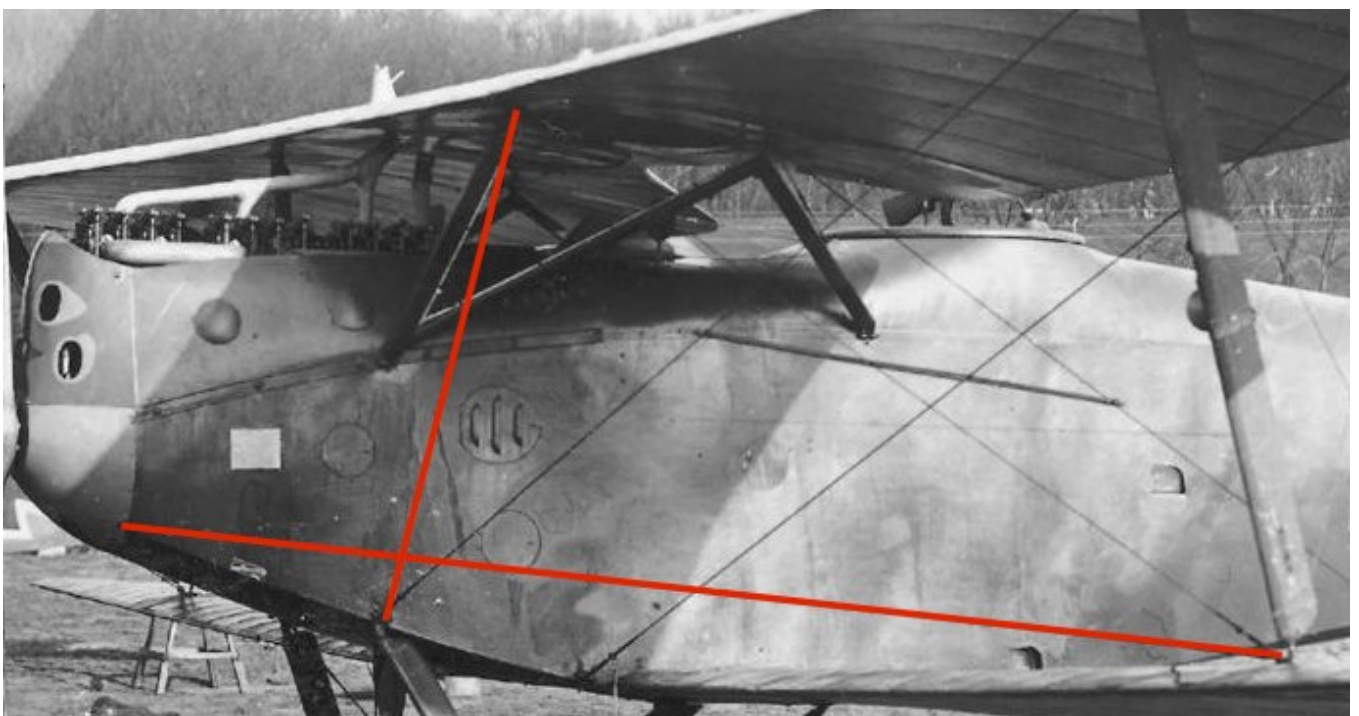
Drag wires:

Two drag wires were 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.

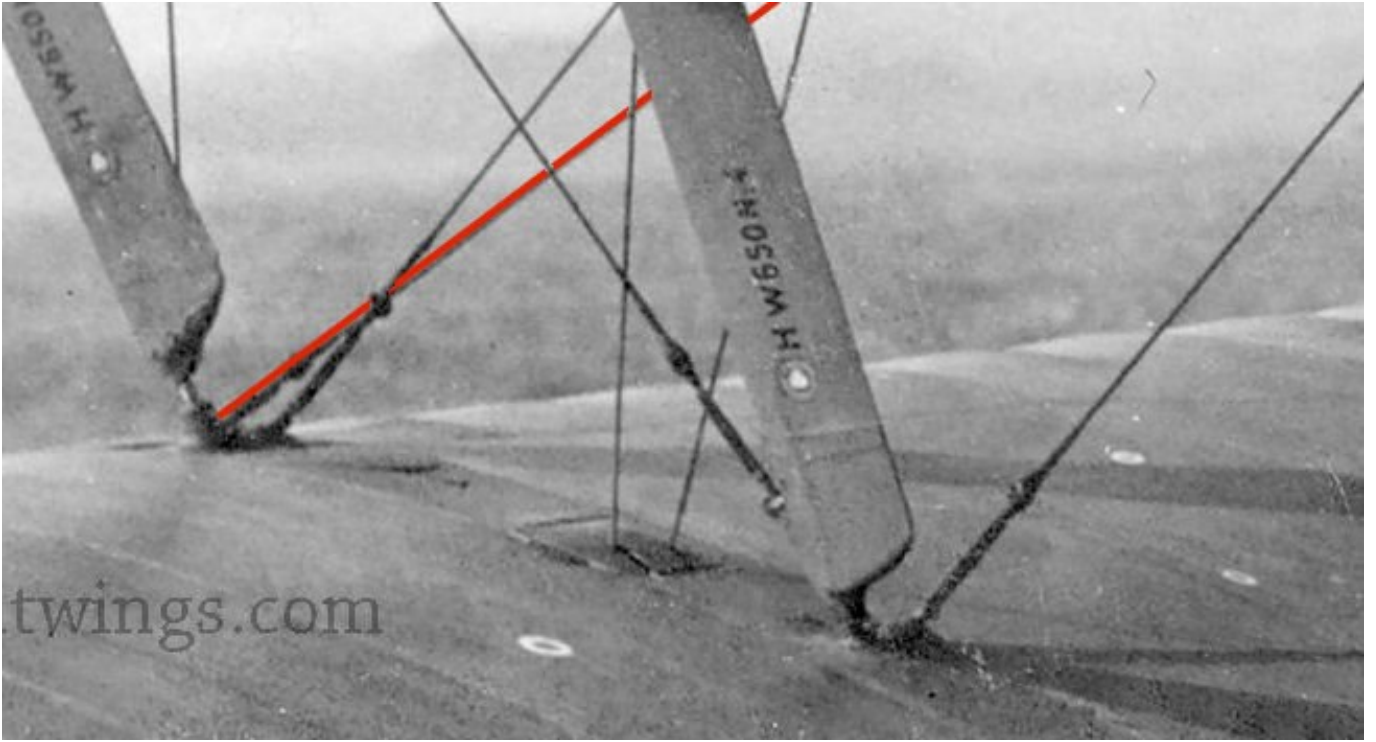
A second wire was attached to the bottom of the nose cowl and routed out to the top surface of the lower wings, at the bottom of the forward interplane strut.

Adjustable turnbuckles were fitted at the interplane struts of the lower wings for the lower wing drag wires.

Adjustable turnbuckles were fitted at the landing gear front struts for the upper wing drag wires.

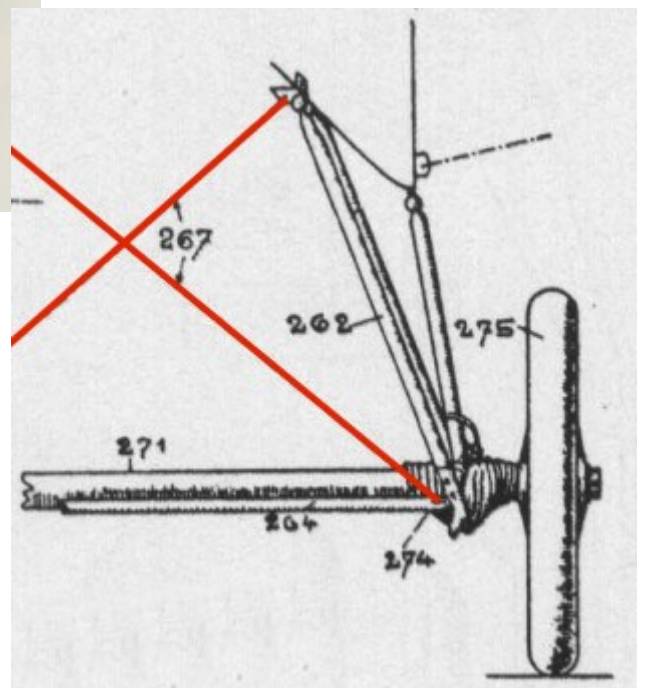
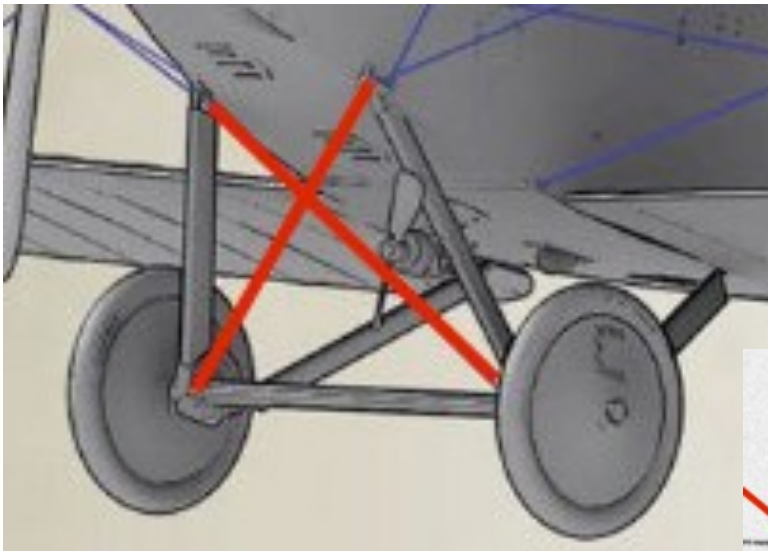






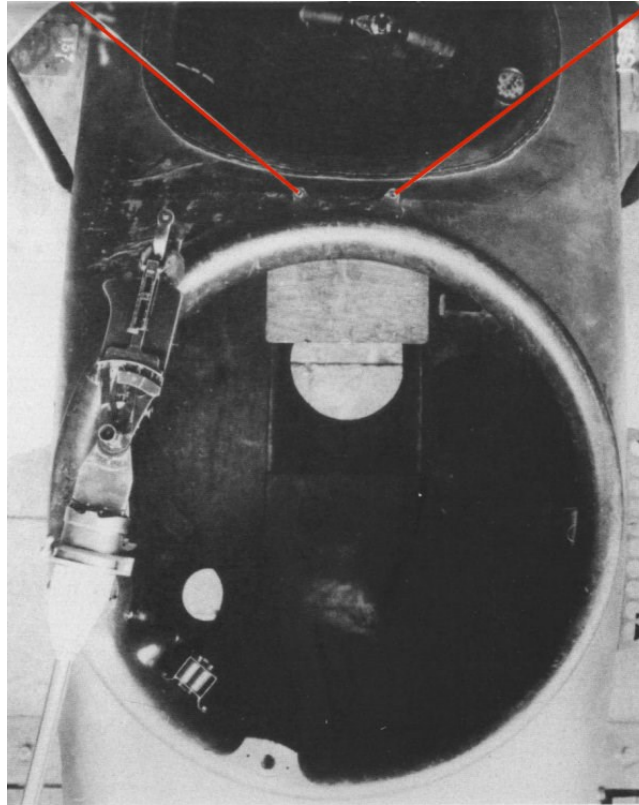
Landing gear bracing wires:

A pair of crossed bracing wires were attached between the top of the landing gear forward struts and down and crossed to the outer ends of the landing gear bracing bar. Adjustable turnbuckles were fitted in the wires at the landing gear.



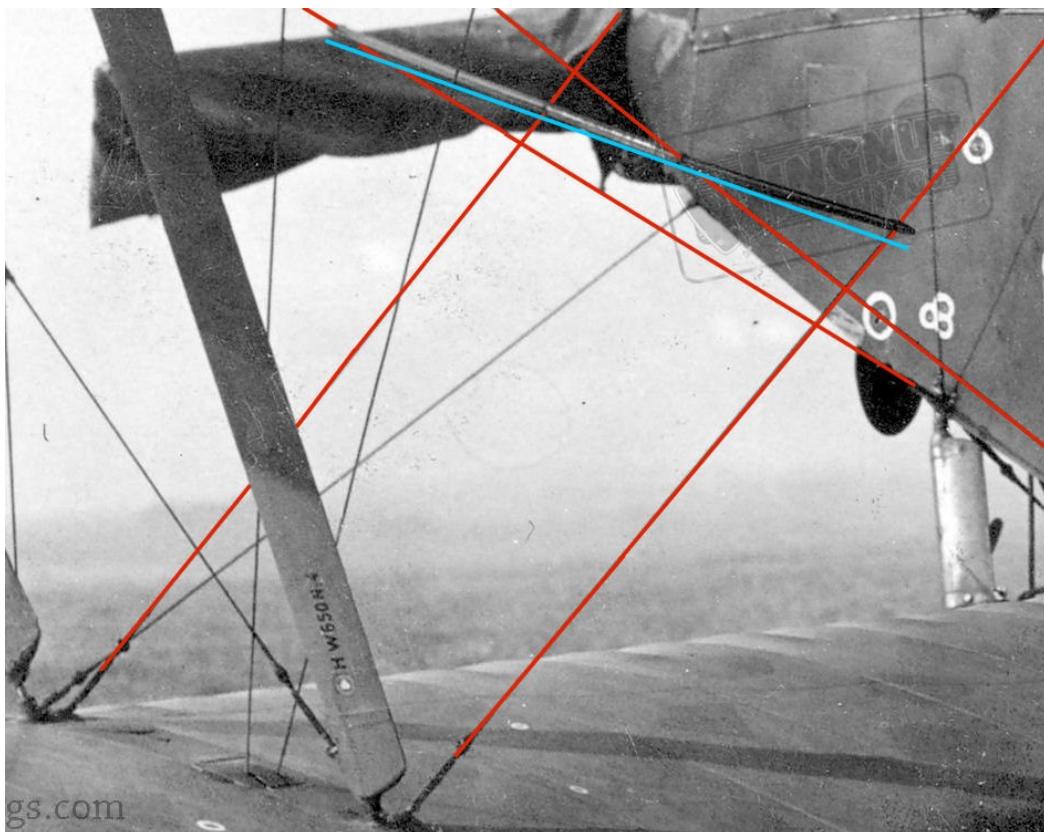
Rear cabane bracing wires:

A bracing wire was fitted from each side and in front of the observers cockpit. These wires were routed to the underside of the upper wing at the top of the fuselage rear cabane struts. No adjustable turnbuckles appear to be externally visible, so will not be fitted.



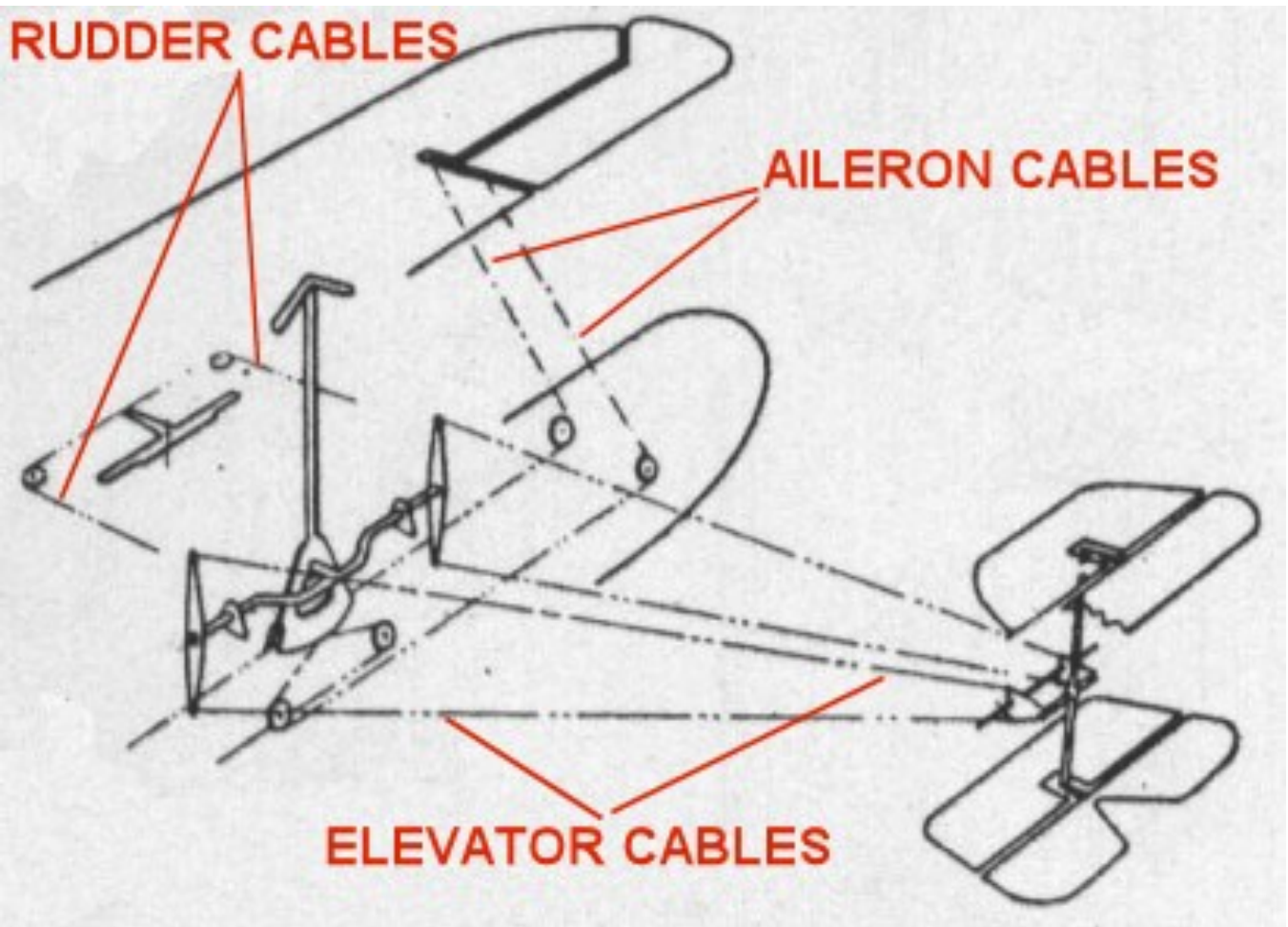
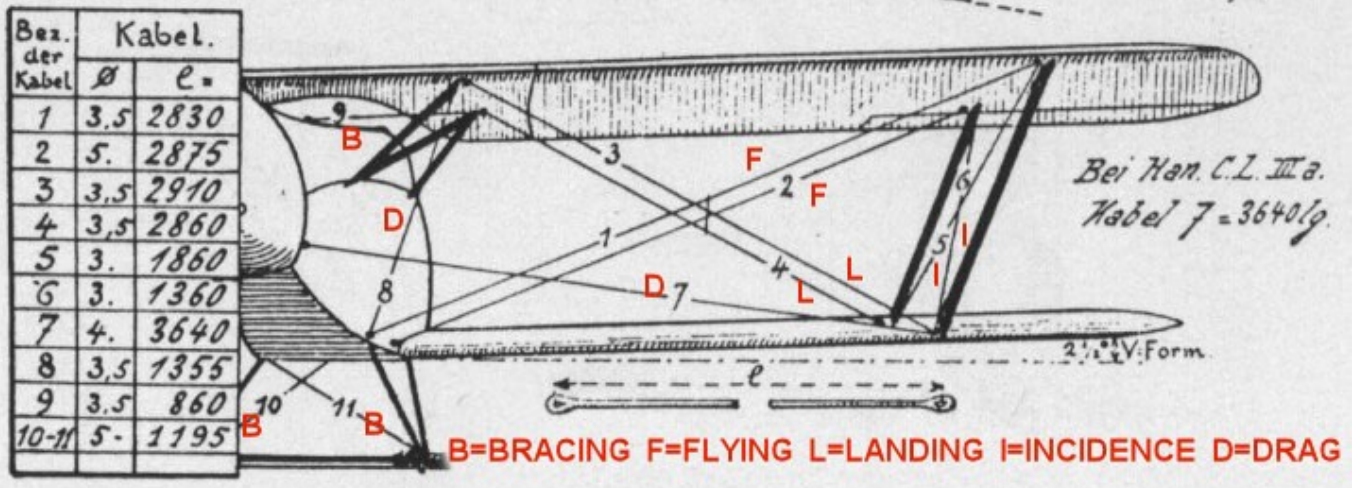
Flying wire bracing bar:

A bracing bar was fitted at both sides of the aircraft and between the front and rear flying and landing wires. This tied together the wires to prevent them individually vibrating or flexing.





Cable locations and diameters



**NOTE:** Wingnut Wings did provide a correction sheet for the rigging of this aircraft. However, this correction sheet is **not applicable** for this particular model build.

**RIGGING GUIDE** Rigging material not supplied

0.5mm

Rigging "batons" x2  
41mm long

0.15mm

0.15mm

0.15mm

A

D

If you choose to install the rigging on your model please drill all location holes with a 0.5mm drill bit to a depth of at least 1mm to remove paint and improve adhesion. Do yourself a favour and make the rigging as simple as possible by using stretchy elastic type material like "EZ Line" etc and not trying to replicate turnbuckles.

17

# PART 7

# ENGINE

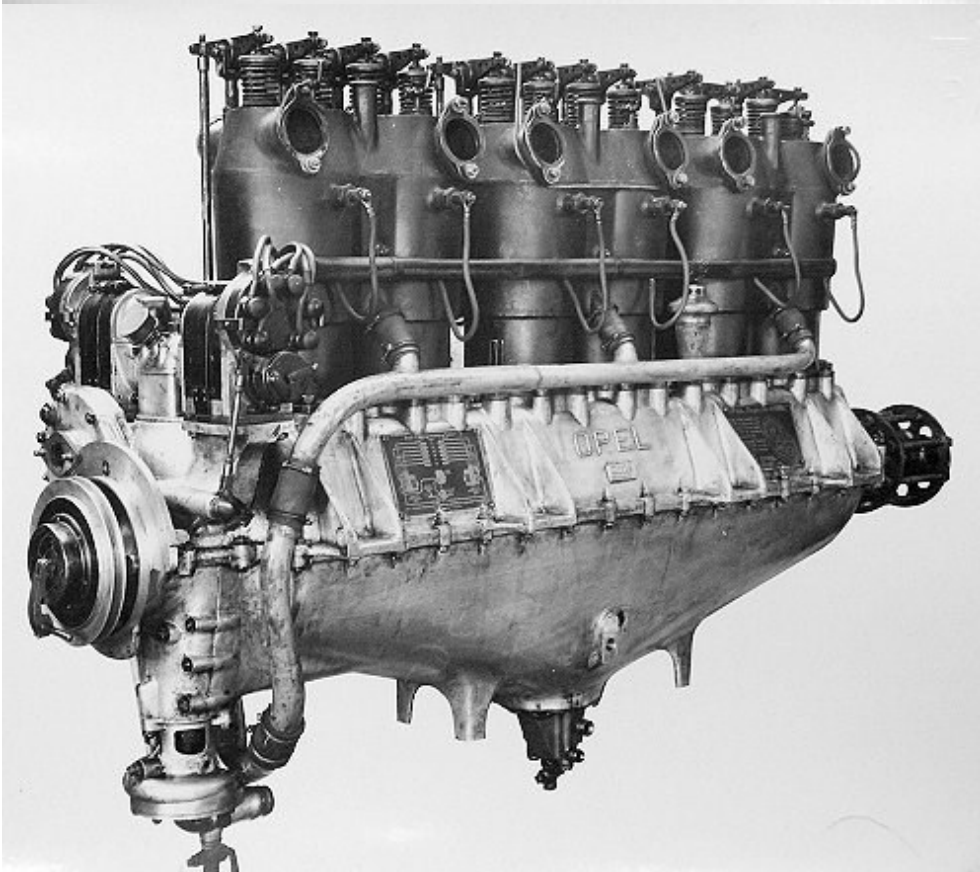
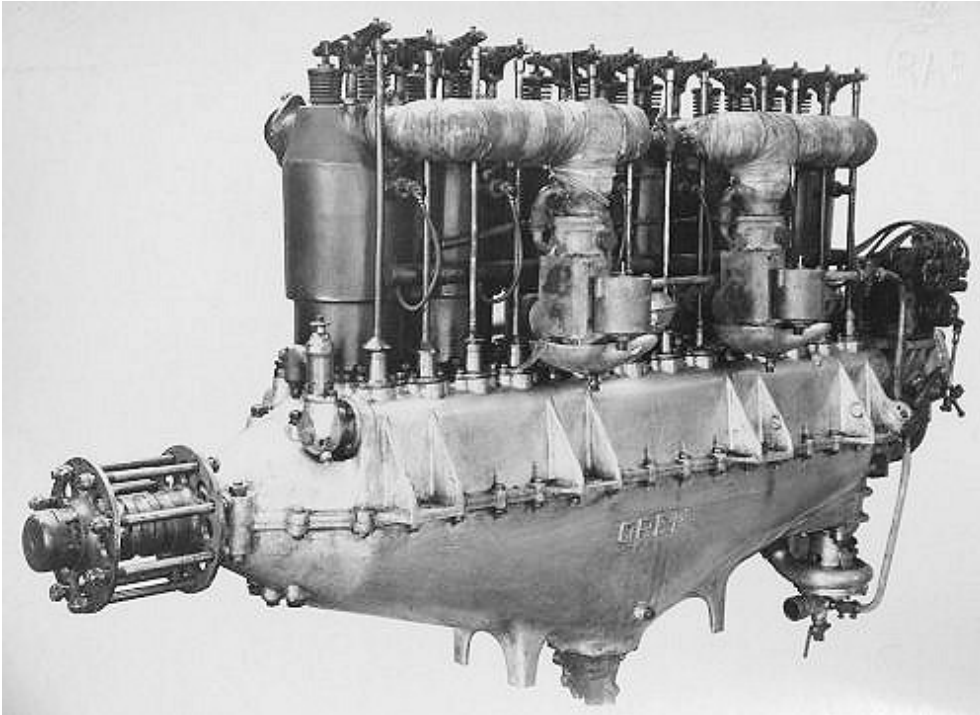
## PART 7 - ENGINE

### 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:** Refer to Page 9 of the kit instruction manual.

Remove from their sprue gates and prepare the following engine parts:

- E1 - Propeller shaft
- E2 - Magnetos (x2)
- E4 - Ignition lead support tubes (x2)
- E5 - Drive train housing
- E6, E7 - Engine sump halves
- E8 - Radiator pipe
- E10 - Oil pipe
- E11 - Right half of cylinder bank
- E12 - Crank case
- E13 - Left half of cylinder bank
- E18 - Induction manifold
- E20 - Radiator pipe
- E21 - Coolant delivery pipe

## **Assembly:**

Cement the two halves of the engine sump (E6, E7) together.

Cement the propeller shaft (E1) into its locating recesses in the crank case.

Cement the crankcase (E12) onto the sump assembly.

## **Modification:**

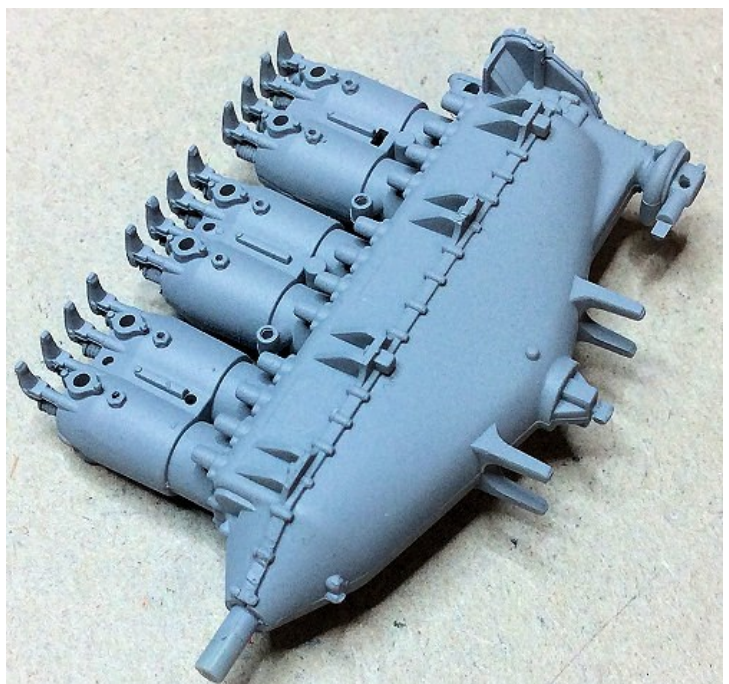
**NOTE:** The engine has the valve push rods on the left side of the engine cylinders (E14). These are moulded as solid parts that also include the ignition lead support tube. These moulding do not look realistic. Also the three pairs of cylinders are joined at their bases, which is not correct for the actual engine. Therefore the alternative cylinder half E13 was used.

Also, to allow insertion of ignition leads into the spark plugs, the pre-moulded plugs need to be replaced.

Cement the two halves of the cylinder banks (E11, E13) together.

Cut away the spark plugs from the sides of the engine cylinders, making sure to leave the base 'nut' intact.

Drill a hole of 0.5 mm diameter through the centre of the base nuts and into the hollow engine cylinder. These holes will be used for adding tubing later in the engine build.





Point mark around the inside of the engine exhaust (E16, E17) exit ports.

Using a starting drill of 0.4 mm diameter, carefully drill into the exhaust, making sure the drill does not 'break through' the sides of the exhaust.

Carefully drill out with slightly larger drills to increase the size of the opening. I increased the size of the drills up to 0.8 mm diameter.

Apply cement around the drilled out opening to smooth out any irregularities.

Cut two short lengths of 0.8 mm diameter Brass tube equal in length to the length of the rear end of the two ignition lead support tubes (E4) at the rectangular locating lug.

Cut away half of the ignition support tubes at the rear ends.

Locate the Brass tubes onto the cut ends of the ignition lead support tubes. This leaves a hollow end for inserting ignition leads later in this build.

Using thin CA adhesive, secure the tubes onto the ignition lead support tubes (not at the open end of the tubes).



### **Painting:**

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

Airbrush all of the engine parts, except the two ignition lead support tubes (E4) with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the two ignition lead support tubes (E4) with 'Tamiya' Hull Red (XF9) or similar.

Blank off the engine cylinders (masking tape).

Airbrush the engine crankcase with 'Alclad' Duraluminium (ALC102) or similar.

Remove the masking.

Brush paint engine details as following:

**'Mr. Colour' Brass (219)** - Push rod guides in engine block, float chambers on induction manifold, switch cylinders on magnetos.

**'Mr. Colour' Stainless Steel (213)** - Pipe connections clamps, valve springs, valve tappets, housings of induction manifold, housings of magnetos.

**'Tamiya' Hull Red (XF9)** - Magneto faces (ignition lead connections), induction manifold ports (left side of cylinder bank), Exhaust ports (right side of cylinder bank).

### **Modification (continued):**

#### Spark plugs:

**NOTE:** *To allow insertion of ignition leads into the spark plugs, the pre-moulded plugs were removed and 0.5 mm diameter holes drilled into the bases of the spark plugs.*

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

Secure a tube into each of the pre-drilled holes, using thin CA adhesive.

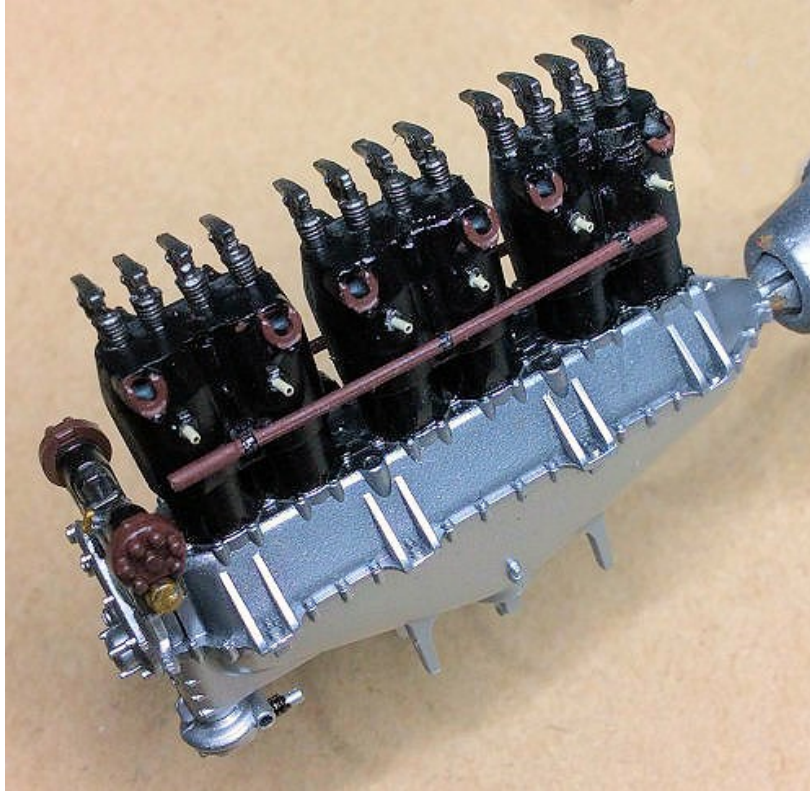
Brush paint each tube with 'Tamiya' Deck Tan (XF55) or similar.

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

Cement the two magnetos onto their mounting platforms at the rear of the engine. The spigots on the rear of the magnetos locate into the holes in the drive housing.

Cement the two ignition lead support tubes into their recess and locating holes in the sides of the cylinder bank.





### **Modification (continued):**

#### **Ignition 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.

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

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

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.

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

Cement the Induction manifold assembly (E18) into its locating holes in the left side of the cylinder block (ten holes in total).

Cement the pipe (E10) into its locating hole in the left side of the water pump housing. The top of the pipe should be aligned with the pipe from the induction manifold above.



### **Modification (continued):**

#### **Valve push rods:**

Using a 0.5mm diameter drill, clean out any primer or paint from the pre-moulded holes in the twelve push rod guides in the left side of the crankcase.

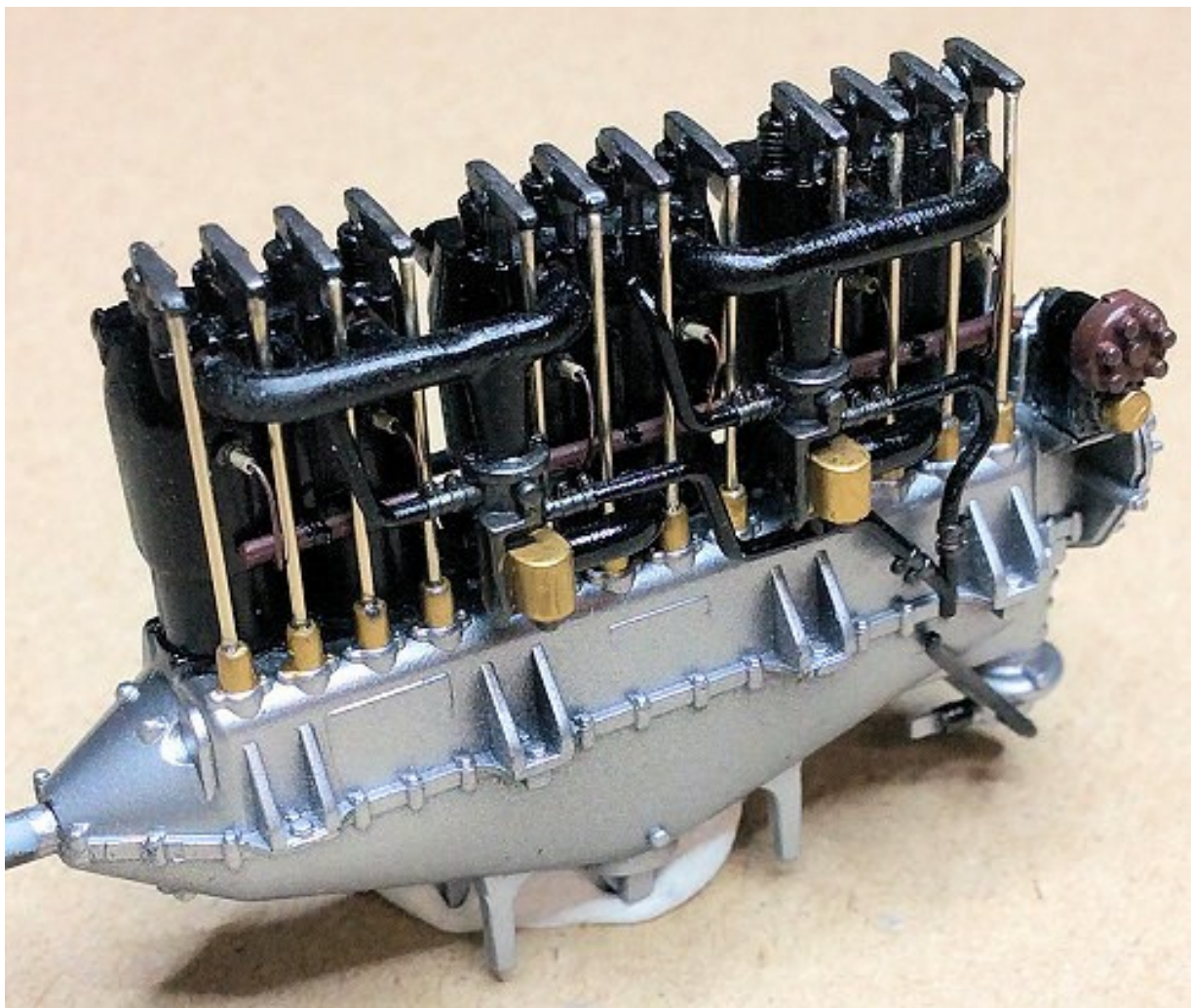
Cut a length of 0.5 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST05 or similar.

**NOTE:** *The valve push rods can be located down behind the intake manifolds and into their push rod guides.*

Trim the length of the rod such that it locates into a push rod guide with the top of the rod in contact with the underside of the associated valve lever at the top of the cylinder.

Use thin CA adhesive to secure the rod in position in its push rod guide and the underside of the valve lever.

Repeat the procedure to add push rods to the remaining eleven cylinders.



#### **Ignition leads (continued):**

Cut six 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.

**NOTE:** *During the following steps you may find not all six wires will fit into the end of the support tube. In this case fit as many as possible then add the remaining wires after.*

Twist the ends of the wires together and secure them with thin CA adhesive.

Cut the twisted end of the wire bunch such that it can be inserted into the end of a support tube, then secure in the tube using thin CA adhesive.

Trim the length of each wire then loop the wires around and onto a connection stub on the front of the magneto.

Secure the wires the magneto stubs using thin CA adhesive.

Repeat the procedure to add six wires to the opposite support tube and magneto.

### **Decals:**

**NOTE:** Refer to Part 4 (Decals) of this build log and page 9 of the kit instruction manual for more information.

Apply the two kit supplied decals (110 and 111) to the left side of the engine crank case.

### **Weathering:**

**NOTE:** Refer to Part 3 (Weathering) of this build log for more information.

To provide a good base for weathering and to seal in applied decals, airbrush the engine with a matte clear coat, such as 'Alclad' Flat (ALC-314) or similar.

### **Engine:**

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

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

Lightly brush stains on the engine using 'AK Interactive' Kerosene (AK2039 with Engine Oil (AK2019 on the valve push rods.

### **Exhaust pipes:**

Airbrush the two exhaust pipes with 'Alclad' Exhaust Manifold (ALC123) or similar.

Airbrush the two exhaust pipes 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 exhaust pipes - I used 'Flory Models' Dark Dirt fine clay wash and Grey on the exhaust pipes.

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

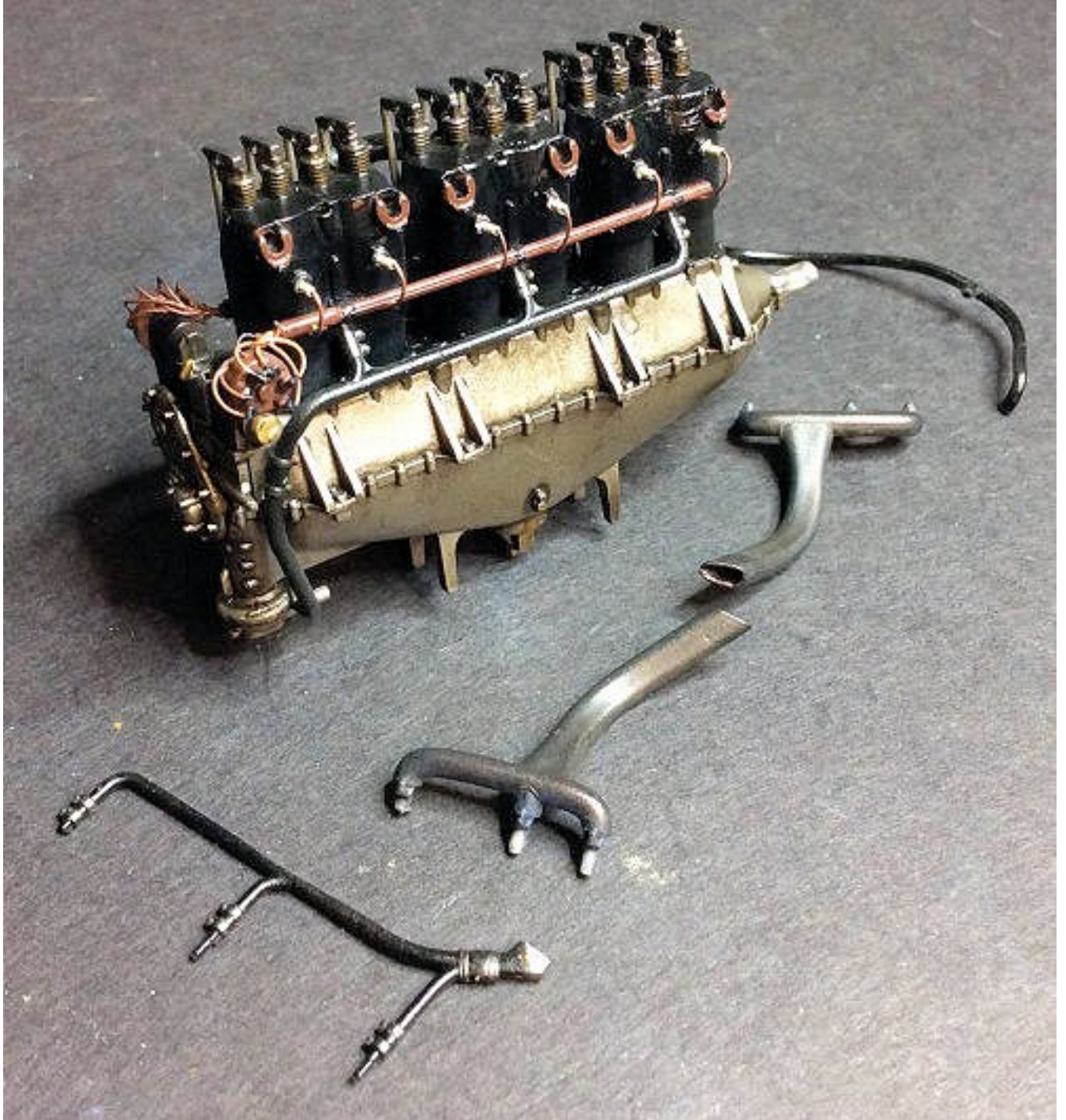
Lightly sponge 'Tamiya' Weather Master Set D (Burnt Blue) around engine end of the exhaust pipes.

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

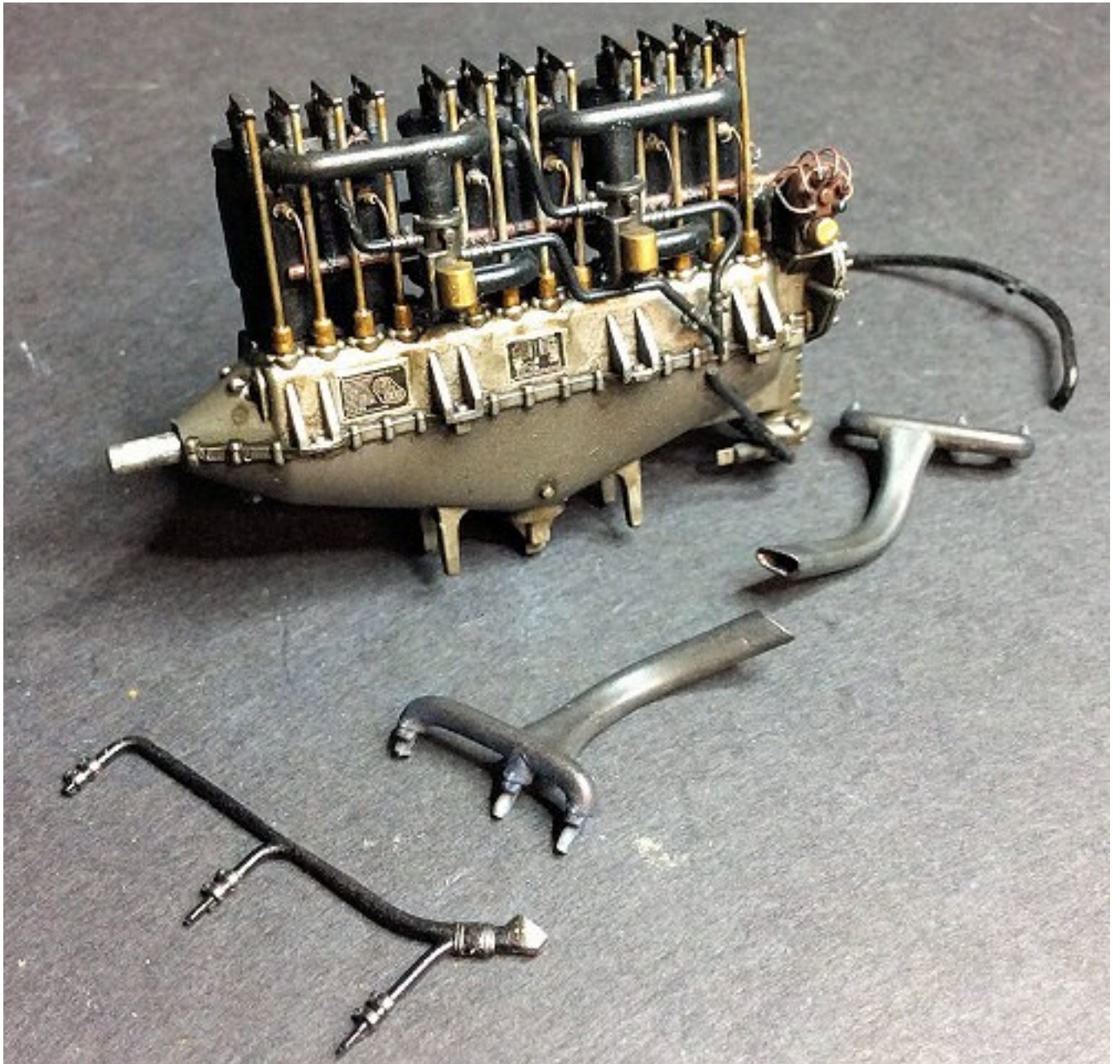
### **Assembly (continued):**

**NOTE:** The two radiator pipes (E8, E20) and exhaust pipes (E16, E17) will be fitted between the engine and upper wing later in this build.









# PART 8

# PROPELLER

## **PART 8 - PROPELLER**

The kit supplied propellers represent types manufactured by either 'Niendorf', 'Germania' or 'Reschke'. However, I preferred to replace the kit supplied propeller with a 'ProperPlane' wood laminated 'Reschke' propeller (WP-032).



### **Decals:**

**NOTE:** Refer to page 25 of the kit instruction manual for positioning of the propeller decals.

Apply the 'Reschke' logo decals (114) onto the front face of the propeller blades (cross towards the propeller tips).

### **Painting:**

Carefully saw off the two propeller boss plates from the resin mould block.

Carefully sand the rear (cut faces) of the boss plates to reduce them to the thickness of the cast boss plates. Use a finger to 'drag' sand the each boss over a flat piece of suitable sand paper, checking regularly to ensure the sanded faces are flat and equal thickness around the boss plates.

Brush paint the two boss plates with a steel colour, such as 'Mr. Colour' Stainless Steel (213) or similar.

Using thin CA adhesive, secure the rear and front boss plates centrally onto the hub of the propeller.

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



# 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:**

**NOTE:** *The kit supplied Spandau machine gun will be modified to accept the 'Master' Spandau LMG 08/15 barrel and jacket (AM-32-023). You may wish instead to use the kit supplied complete weapon (A18) or use the kit supplied photo-etch cooling jacket (P14) with weapon A30).*

### **Preparation:**

Remove from their sprue gate and prepare the kit supplied Spandau machine gun parts A29, A30, A39 and A58.

Remove from their 'Master' photo-etch sheet and prepare parts 1, 2 and 4 with the cooling jacket, barrel and muzzle.

### **'Master' parts:**

**NOTE:** *All photo-etch parts are secured thin CA adhesive. Not all of the supplied parts are required for this model build.*

Secure the rear plate (1) onto the rear (slots around edge, not holes) of the cooling jacket.

Locate the front plate (2) onto the barrel.

Slide the barrel through the cooling jacket and through its locating hole in the rear plate (1).

Align the barrel along the cooling jacket slots with the front plate positioned.

Secure the front plate to the cooling jacket and the barrel to the front and rear plates.

Secure the muzzle into its locating hole in the front of the barrel.

Secure the forward gunsight (4) onto the top, front of the cooling jacket.

### **Kit part modification:**

**NOTE:** *The following modification to the kit supplied part is necessary to allow fitting of the 'Master' photo-etch parts.*

Carefully cut away the cooling jacket/barrel of the weapon (A30) as shown in the following photograph. Care is needed to ensure that enough is removed to allow the 'Master' cooling jacket to be located without separating the breech block and framework.

Use the 'Master' assembly as a guide, point mark the position of the rear end of the barrel onto the front of the modified breech block. The mark should be made so the cooling jacket assembly, when fitted, is centrally aligned to the breech block and is aligned with the breech block when viewed from above and the side.

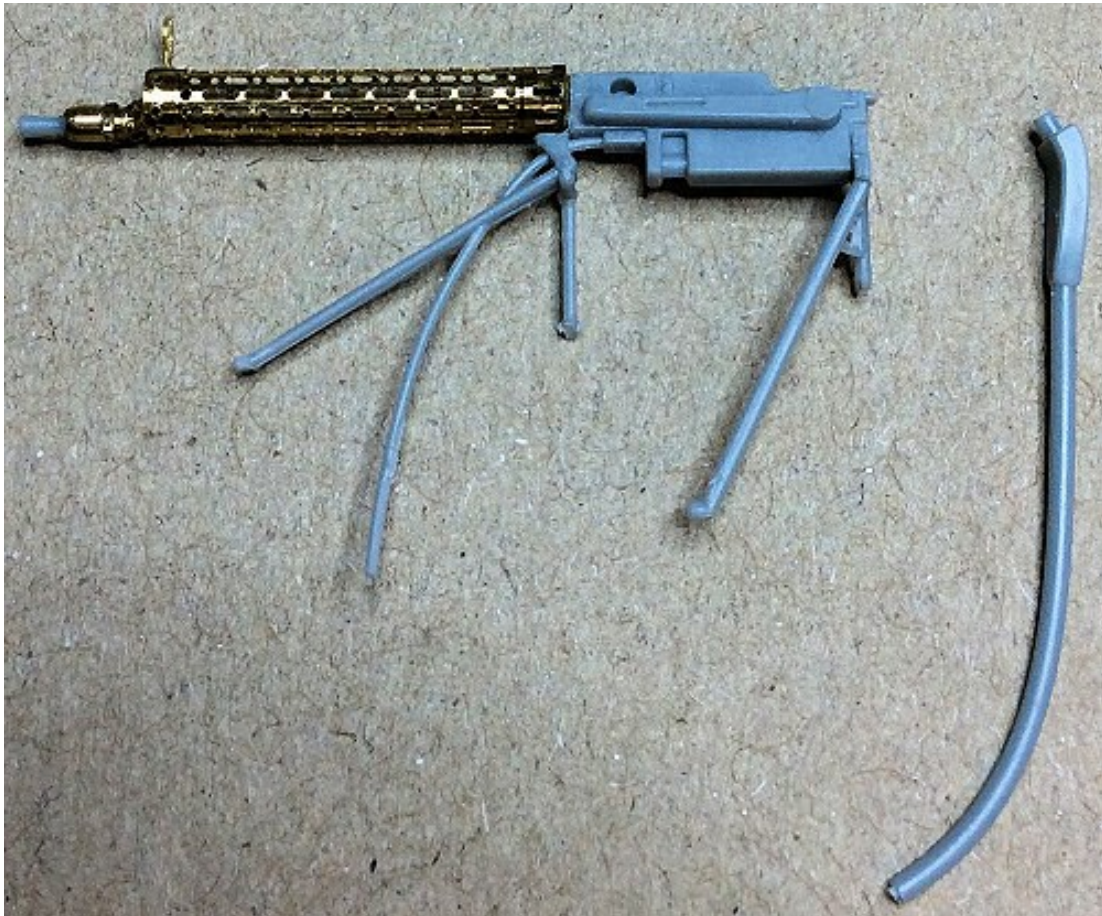
Using the point mark as a guide, drill a hole of 0.8 mm diameter into the breech block, deep enough to fully accept the rear of the barrel. Make sure the hole is drilled parallel to the top and sides of the breech block.



Cement the cocking lever (A29) into its location on the right side of the breech block.

Cement the rear support frame (A39) onto its location on the rear of the breech block.

Using thin CA adhesive, secure the 'Master' photo-etch assembly onto the front of the breech block, making it is centrally aligned to the breech block and is aligned with the breech block when viewed from above and the side.



#### Painting:

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 gun 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 rear support legs (A39) with 'Tamiya' Grey Green (XF76) or similar.

Brush paint the two front support legs (A30) and the empty cartridge chute (A58) with 'Tamiya' RLM Grey (XF22) or similar.

Brush paint the trigger cable conduit (A30) with 'Tamiya' Semi-Gloss Black (X18) or similar.

Brush paint the handle on the cocking lever (A29) with 'Tamiya' Hull Red (XF9) or similar.

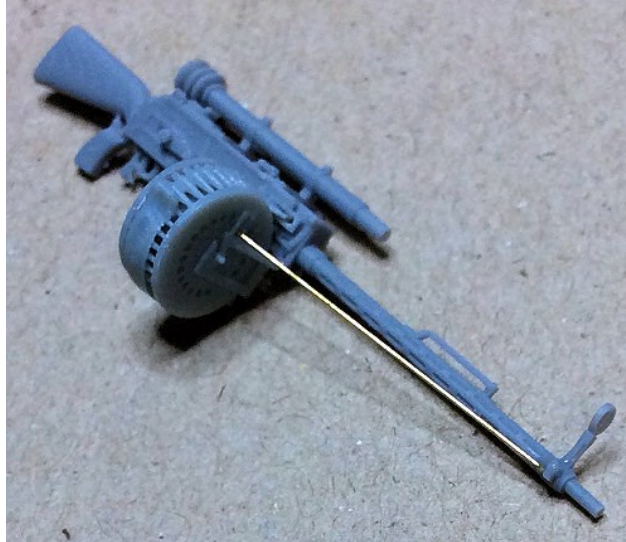
## 'Parabellum' machine gun:

**NOTE:** *The kit supplied Parabellum machine gun will be replaced with the 'Gaspatch' Parabellum 14/17 resin machine gun. Secure the parts together using thin CA adhesive.*

### Assembly:

Secure the ammunition drum onto the right side of the breech block of the machine gun.

Secure the Brass bracing rod between its locating indent on the front face of the ammunition drum and the rear of the protruding lug at the end of the barrel.



### 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 gun 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 rear eye cover on the gun sight with 'Tamiya' Rubber Black XF85) 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 Burnt Sienna.





**PART 10**  
**PREPARATION**  
**FOR INTERNAL**  
**RIGGING**

## PART 10 - PREPARATION FOR INTERNAL 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, will be difficult to see, being hidden by the fuel tank and pilots seat.

Therefore, you may decide **not to fit** either the **elevator or the rudder** control cables in the cockpit area.

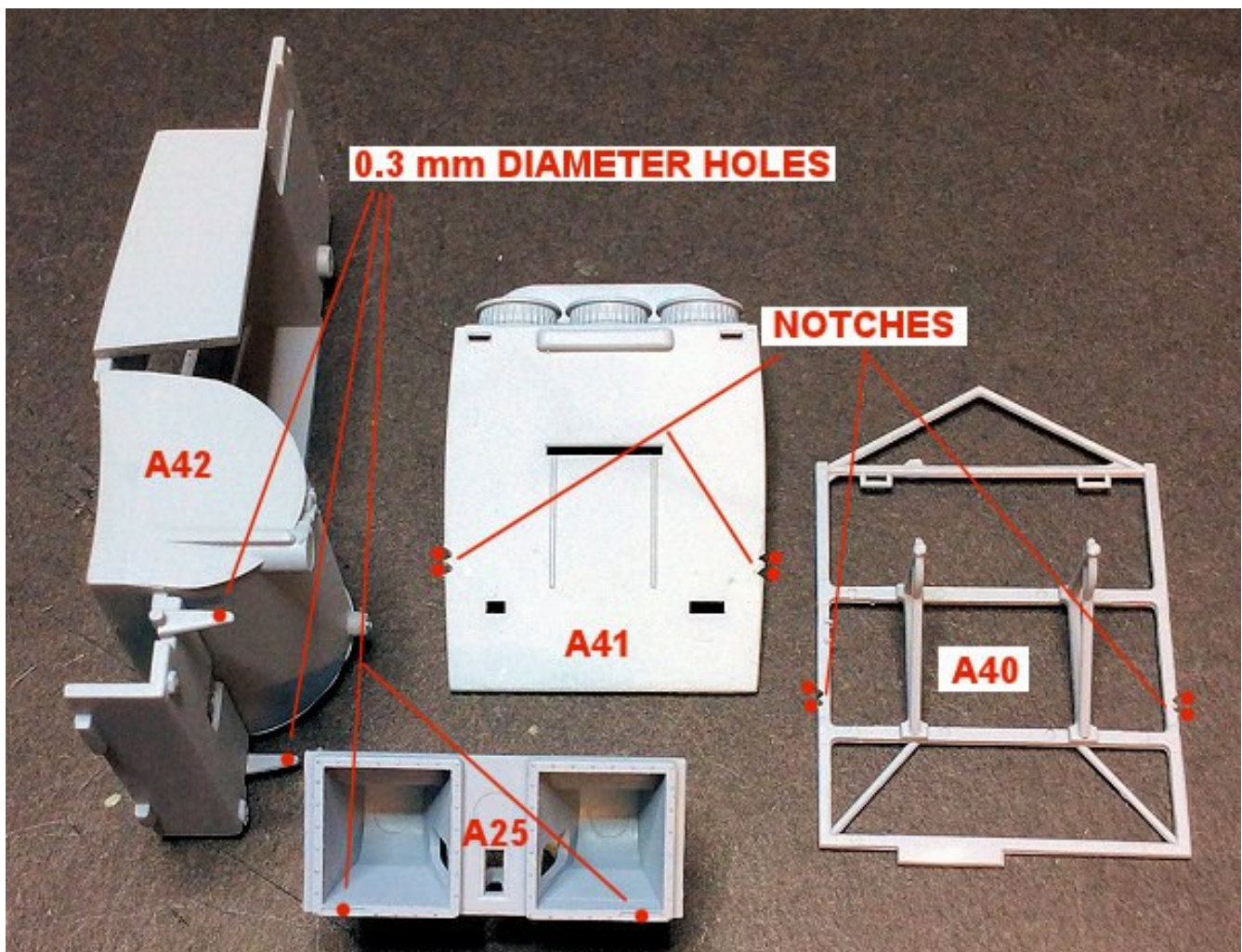
### Rudder control cable:

Drill a hole of 0.3 mm diameter through the ends of the two elevator control horns on part A42.

Using the pre-moulded recesses as guides, drill a hole of 0.3 mm diameter through the bottom edge of part A25.

File or cut two notches in the sides of part 41. The lower notch should be 9.5 mm from the bottom edge.

Using the pre-moulded recesses as guides, file or cut the two recesses to slightly deepen them.





# PART 11

# PHASE 1

## **PART 11 - PHASE 1**

### **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.*

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

### **Preparation:**

### **NOTE:**

*Refer to the kit instruction manual for the parts required.*

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

Remove the required styrene and photo-etch parts from their sprue gates and prepare the parts for painting and assembly.

### **Assembly:**

Cement the two pilot seat supports (D15) into their locating holes in the front of the seat frame (A40). Make sure the support are fully located and parallel to each other.

Cement the ammunition drums shelf (A37) onto the observers rear bulkhead (A41).

Cement the 'Telefunken' Type D wireless (G49) onto its locating holes in the frame A15).

Cement the wireless cable reel (A8) into its locating hole in the frame (A15).

Bend the photo-etch parts (P2 and P5) as shown on page 4 of the kit instructions. When bent the parts should fit through the slots in the floor (A27) for the observers cockpit.

Anneal (soften) the four photo-etch seat belts (P1, P4, P11, P12) by passing them over a naked flame, such as a cigarette lighter) until they change colour.

**NOTE:** *The floor panel (A1) should only be cemented into the observers cockpit floor (A27) if the 'Flieger Kammer' camera (A21, A22) is not being fitted. The following steps are required for this model as the camera will be fitted.*

Cement together the two halves of the 'Flieger Kammer' camera (A21, A22).

Use a 0.8mm diameter drill to drill into the locating recesses in the top, front of the camera (for locating the two front support legs D1).

Clip the rear support frame (A20) into its locating recesses in the top, rear of the camera, making sure the horizontal cross bar is towards the camera.

Locate the cockpit floor (A27) onto the cockpit floor/fuel tank (A42).

Locate the camera/rear support frame through its locating holes in the cockpit floor (A27).

Carefully lower the legs of the rear support frame through their locating holes until the two front support legs (D1) can be located into their locating holes in the camera and cockpit floor.

With the camera support frame and legs fully located through the cockpit floor (A27), make sure the camera is vertical when viewed from the rear and sides.

Cement the rear frame and front support legs into their locations in the top of the camera.

Once the cement has fully set, carefully remove the camera/support assembly from the cockpit floor and remove the floor from the cockpit/fuel tank (A42).

## **Painting:**

Brush photo-etch primer, such as 'Mr. Metal' Primer R or similar, over the following photo-etch parts:

Seat belts P1, P4, P11 and P12

Brackets P2 (x2) and P5

Cover panel P10

**NOTE:** *Before painting, airbrush the parts first with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.*

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

Instrument board A26

Seat frame A26

Observers cockpit floor A27

Floor panel A1

Wireless set frame A15 and cable drum A8

Engine bearers A10 and A19

Ammunition shelf A37

Inner surfaces of fuselage halves F1 and F9

Cockpit floor A42 (not the fuel tank).

Airbrush the following parts with 'Alclad' Duraluminium (ALC-102) or similar:

Photo-etch panel P10

Rudder bar container A25

Spandau magazine A2

Pilots seat A34.

Airbrush the following parts with 'Tamiya' Grey Green (XF76) or similar:

Photo-etch brackets P2 and P5

Control column A11

Rudder bar A50

Engine bearers support frame A19

Wireless generator clutch control A54

Pilots seat supports D15.

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

Camera body A21/A22

Fuel tank on cockpit floor A42.

Airbrush the following parts with 'Tamiya' Deck Tan (XF55) or similar:

Observers rear bulkhead A41

Photo-etch seat belts P1, P4, P11 and P12.

Observers seat A14

Pilots seat cushion A13.

Brush paint the following parts with 'AK Interactive' Brown Leather (AK3031) with British Light Uniform (AK3082) highlights or similar:

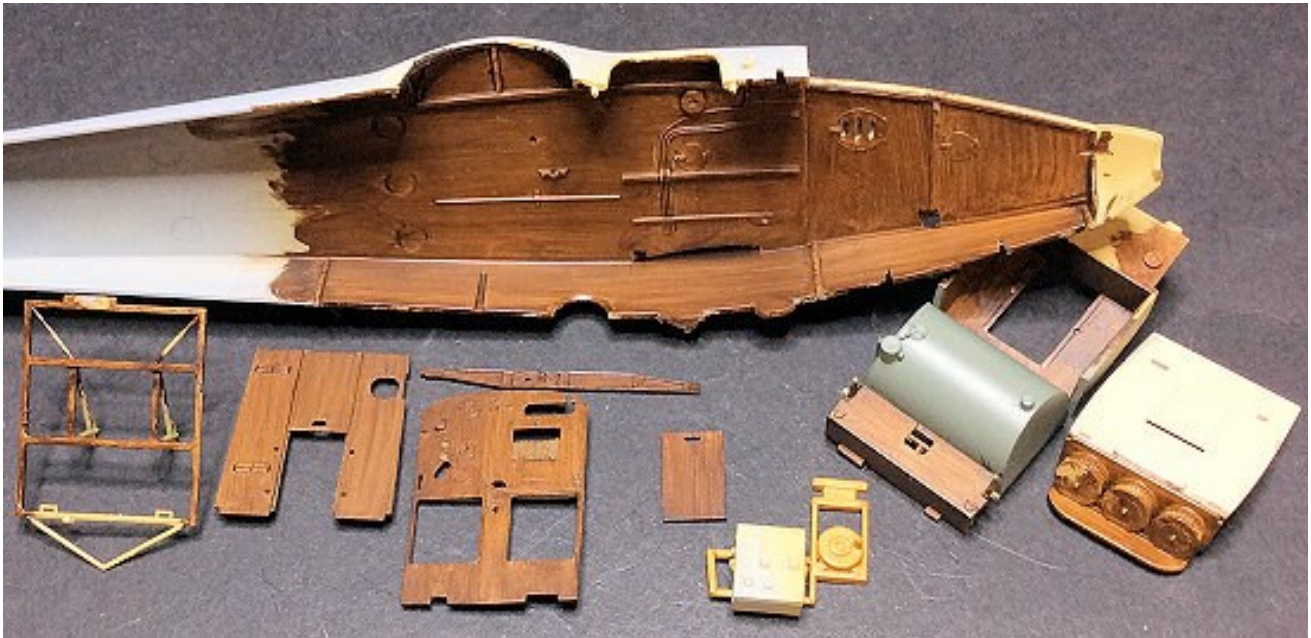
Observers seat A14, pilots seat cushion A13 and head rest on the rear bulkhead A41.

### Wood effects:

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

- Instrument board A26
- Pilots seat frame A40
- Cockpit floor A42 (not the fuel tank).
- Observers cockpit floor A27
- Floor panel A1
- Engine bearers A10 and A19
- Ammunition shelf A37
- Inner surfaces of fuselage halves F1 and F9.

Refer to Part 2 (Wood Effects) of the build log for more information. Apply wood effects to the Wireless set frame A15 and cable drum A8. I used 'Windsor & Newton' Griffin Alkyd Raw Sienna oil paint:



### Details - brush paint:

'Tamiya' Grey Green (XF76) or similar:

- Camera support frames D1 and A20
- Top rail and metal fitting on pilots seat support frame A40
- Pilots seat supports D15
- Elevator control rod and horns.

'Tamiya' RLM Grey (XF22) or similar:

- Wireless set G49
- Oil tank A16
- Magazine stay rod on engine bearer A10
- Metal fittings on observers seat A14
- Seat support rods on observers bulkhead A41
- Metal plate on underside of observers seat A14.

'Tamiya' Semi-gloss Black (X18) or similar:

Starter magneto A44  
Photographic plates container G24  
Control hinges and knobs on wireless set G49  
Instrument in left rear of cockpit floor A42  
Top of camera A21/A22.

'Mr. Colour' Brass (219):

Oil pump A7  
Fuel filter A51  
Switch and ammunition on instrument board A26  
Fuel tank pressure pump A33  
Bullets rounds in observers ammunition drums A37  
Filler caps on fuel tank A42 and oil tank A16.

'Tamiya' White (XF2) or similar:

Pipes in fuselage left half F9, Pipes on front of instrument board A26.  
Pilots seat cushion A13  
Edging around pilots seat A34  
Observers seat A14  
Head rest on observers rear bulkhead A41.

'Tamiya' Medium Blue (XF18) or similar - Pipes on front and rear of instrument board A26.

'Mr. Colour' Stainless Steel (213) or similar:

Metal fittings on seat belts P1, P4, P11 and P12  
Panels on camera body A21/A22  
Access panels on inside of fuselage left half F9  
Fittings and pipes on fuselage right half F1.  
Shaft on fuel tank pressure pump A33  
Rudder control cable pulley on cockpit floor A42  
The fuselage nose areas, forward from the first pre-moulded fuselage frames  
Throttle control lever A45.

'Tamiya' Hull Red (XF9) or similar:

Hand grips on control column A11  
Handles on: Wireless cable drum A8, fuel tank pressurizing pump A33, oil pump A7,  
wireless generator clutch A54, throttle control lever A45.

'Tamiya' Buff (XF57) or similar:

Ammunition belts on observers ammunition drums A37 and ammunition on instrument board A26.

'Tamiya' Metallic Grey (XF56) or similar - Observers ammunition drums.

'Mr. Colour' Copper (215) or similar - bullet heads on ammunition on instrument board A26.

'Tamiya' Red (XF7) - Control lever A9.



## **Assembly (continued):**

**NOTE:** Refer to pages 4, 5 and 6 of the kit instruction manual. The photo-etch switch levers (P6 (x2)) will not be used as they are too delicate to fit and cant be seen once the fuselage is closed up.

Cement the starter magneto (A44) onto the instrument board (A26).

Cement the oil pump (A7) onto the instrument board (A26).

Cement the fuel filter (A51) onto the instrument board (A26).

Cement the rudder bar (A50) into its housing (A25).

Cement the rudder bar housing (A25) into the instrument board (A26).

Cement the magazine cover (A2) onto the instrument board (A26).

Cement the pilots seat cushion (A13) into the seat (A34).

Cement the observers seat (A14) into the rear bulkhead (A41).

Cement the oil tank (A16) onto the fuselage right half (F1).

Cement the hand air pump (A33) onto the fuselage right half (F1).

Cement the wireless generator clutch (A54) onto the fuselage right half (F1).

Cement the throttle control lever (A45) onto the fuselage left half (F9).

Cement the control lever (A9) onto the fuselage left half (F9).

Using PVA (white glue) adhesive, secure the camera lens (C2) into the camera (A21/A22).

Fully locate the painted photo-etch brackets (P2, P5), from the underside and through their slots in the observers cockpit floor (A27). The P5 fits through the outer slots.

Use thin CA adhesive to secure the brackets onto the underside of the floor.

**NOTE:** Before the next step, use a 0.8mm diameter drill to drill out the locating hole for the observers cockpit floor (A27) into the cockpit floor (A42).

Cement the observers cockpit floor (A27) onto the cockpit floor (A42).

Cement the pilots seat frame assembly (A40) into its locating slot in the cockpit floor (A42), behind the fuel tank. The rear of the frame fits under the front edges of the observers cockpit floor (A27) and against the front edges of the cockpit floor (A42).

Cement the instrument board assembly (A26) onto the front of the cockpit floor (A42) and into its locating lugs.

## **Decals:**

**NOTE:** Refer to pages 4, 5, 6, 7 and 10 of the kit instruction manual for decal locations. Refer to Part 4 (Decals) of this build log for more information. I found it easier to apply some of the 'grouped' decals for the instrument board and wireless set by cutting them into individual decals.

Airbrush a clear gloss coat, such as 'Alclad' Aqua Gloss 600 or similar, over the areas of the model parts that require decals.

Apply the kit supplied decals to the following parts:

Instrument board assembly (A26) - 95, 96, 104 and 107

Wireless set - G7, G8, G9, G10 and G11. The decals G6a and G6b are on the kit lozenge sheet.

Wireless cable reel - 106

Camera - G24, G25 and G26

Fuselage right half - 102, 105, 108 and 109, Fuselage left half - 81, 94 and 100.

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

Using the pre-moulded location for the wireless cable outlet in the left, rear of the cockpit floor (A42) as a guide, drill through the floor using a 0.4mm diameter drill (for adding wireless cable).

Cement the pilots seat assembly (A13/A34) onto its locating lugs on the seat support frames (D15).

Pass the ring ends of the pilots seatbelts (P12) through the rectangular supports on the top of the seat frame A40).

Bend the ring ends over and against the top, rear of the seat belts and secure them together using thin CA adhesive.

Form the two seat belts in the desired positions over the seat and onto the seat cushion.

Secure the belts onto the seat cushion using thin CA adhesive.

**NOTE:** *If the ailerons have be angled, the control column should be tilted slightly either left or right accordingly.*

Cement the control column (A11) onto the cross bar in the cockpit floor (A42).

Locate the four legs of the camera assembly (A20, D1) fully down and into their locating holes in the observers cockpit floor (A27). The longer rear legs should locate into their recesses in the bottom of the cockpit floor (A42).

Cement the four legs to the observers cockpit floor (A27).

Locate the camera floor panel (A1) with the hand hole at the top, down between the rear of the pilots seat frame (A40) and the camera assembly and onto the front edge of the floor opening.

Cement the floor panel (A1) in position.

Cement the photographic plates container (G24) in position on the observers cockpit floor (A27).

Cement the support frame (A15) for the wireless set onto it locating recess in the rear, left edge of the observers cockpit floor (A27).

Pass the top of the observers two seat belts (P4) through their locating slots in the top of the observers rear bulkhead (A41).

Use thin CA adhesive to secure the top of the seat belts onto the rear of the bulkhead.

Use thin CA adhesive to secure the two seat belts vertically against the rear bulkhead.

**NOTE:** *During the following step, check that the bulkhead is correctly positioned by dry fitting the cockpit assembly in position on the fuselage left half.*

Cement the observers rear bulkhead (A41) assembly onto its locating lugs on the rear edge of the cockpit floor (A42).

### **Enhancements:**

**NOTE:** *The following enhancements are desired, but not required. You may wish not to carry out these enhancements. Refer to pages 4 and 6 of the kit instruction manual.*

#### **Rudder control cables (page 6):**

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

Pass one end of the line through the pre-drilled hole at the bottom edge of one of the rudder bar housings (A25).

Secure that end of the line to the underside of that rudder bar housing.

Pass the free end of the line around the pre-moulded control pulley on the outer edge of the pilots cockpit floor (A42).

Pass the rearwards and into the created bottom notches in the side of the pilots seat frame (A40) and the observers rear bulkhead (A41).

Keeping the line taut, use thin CA adhesive to secure it around the control pulley, in the lower notches of the pilots seat frame and observers rear bulkhead, then onto the rear of the observers rear bulkhead.

Cut away any residual line at the rudder bar housing and the rear of the observers bulkhead.

Repeat the procedure to add a rudder line to the opposite side of the cockpit.

#### Elevator control cables (page 6):

**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 0.5 mm diameter Brass tube, such as that supplied from 'Albion Alloys' (MBT05) or similar.

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

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

Pass the line through the tube, then through the pre-drilled hole in the top of one of the elevator control horns at the outer edges of the cockpit floor (A42).

Pass the line back and through the tube.

Slide the tube up to, **but not touching**, the control horn.

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

Pass the free end of the line rearwards and into the remaining created top notches in the side of the pilots seat frame and the observers rear bulkhead, then onto the rear of the observers rear bulkhead.

Keeping the line taut, use thin CA adhesive to secure it in the notches and onto the rear of the observers rear bulkhead.

Cut away any residual line at the control horn tube and the rear of the observers bulkhead.

Repeat the procedure to add an elevator line to the opposite side of the cockpit.

#### Ammunition magazine panel (page 4):

Drill a 0.3 mm diameter hole through the centre, top (opposite side from panel hinge) of the photo-etch access panel (P10) for the pilots ammunition magazine in the instrument board (A26).

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

Pass the line through the drilled hole in the panel and loop it through the hole a second time.

Keeping the line taut, use thin CA adhesive to the line to the panel hole.

Cut away any residual line at the panel.

Drill a 0.3 mm diameter hole through instrument board (A26) at the centre, bottom edge of the opening above the ammunition magazine. Drill the hole from the front of the instrument board and at an angle to align with the pre-moulded panel latch on the pilots side.

Pass the free end of the line through the drilled hole in the instrument board (from the pilots side).

Using thin CA adhesive, secure the bottom edge of the panel to the bottom edge of the opening for the ammunition magazine. The panel should be at a half open angle.

Secure the free end of the line to the front of the instrument board.

Cut away any residual line at the front of the instrument board.

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

**NOTE:** *When test fitting the cockpit assembly into the fuselage halves, make sure all locating holes and mating faces are clear of paint and primer.*

Test fit the cockpit assembly into the fuselage right half (F1), making sure the top, right corner opening of the pilots seat frame is passed over the long spindle of the hand pressurizing pump.

The pilots instrument board locates in front of the fuselage forward, top tab.

The end of the elevator control cross bar locates into its hole in the fuselage side.

The rear cross bar supporting the observers camera locates onto its support bracket on the fuselage side.

The observers rear bulkhead locates in front of its locating tab on the fuselage side.

Make sure the cockpit assembly fully locates onto the fuselage.

With the cockpit assembly in position, test fit the fuselage left half (F1) onto the cockpit assembly and right fuselage half.

The pilots instrument board locates in front of the fuselage forward, top tab.

The end of the elevator control cross bar locates into its hole in the fuselage side.

The rear cross bar supporting the observers camera locates onto its support bracket on the fuselage side.

The peg on the rear of the wireless set locates into its hole in the fuselage side.

The observers rear bulkhead locates in front of its locating tab on the fuselage side.

Make sure the cockpit assembly fully locates onto the fuselage half and the two fuselage halves fully contact each other, with no seam gaps between the two halves.

Remove the fuselage left half, leaving the cockpit assembly located in the fuselage right half.

Cement the cockpit assembly to the fuselage right half. Apply cement where the pilots instrument board, seat frame and observers rear bulkhead contact the fuselage. Also the end of the camera support bar on its fuselage bracket.

**NOTE:** *The engine will be test fitted only to align the engine bearers and support frame in the fuselage halves. The engine will be fitted after the fuselage has been closed up and painted.*

Cement the rear end of the right engine bearer (A10) into its locating recess in the front of the instrument board (A26) and the front end onto the ledge of the first fuselage frame.

Locate the engine bearers support frame (A19) up between the engine bearer and fuselage side, then locate it as follows:

Top of the frame into its locating hole at the top edge of the fuselage side.

Into its location recess and hole in the outer side of the engine bearer.

Into its recess in the opening at the bottom, outer edge of the fuselage side.

Locate the left engine bearer (A12) into its locating recess in the front of the instrument board (A26) and also the engine bearers support frame (A19).

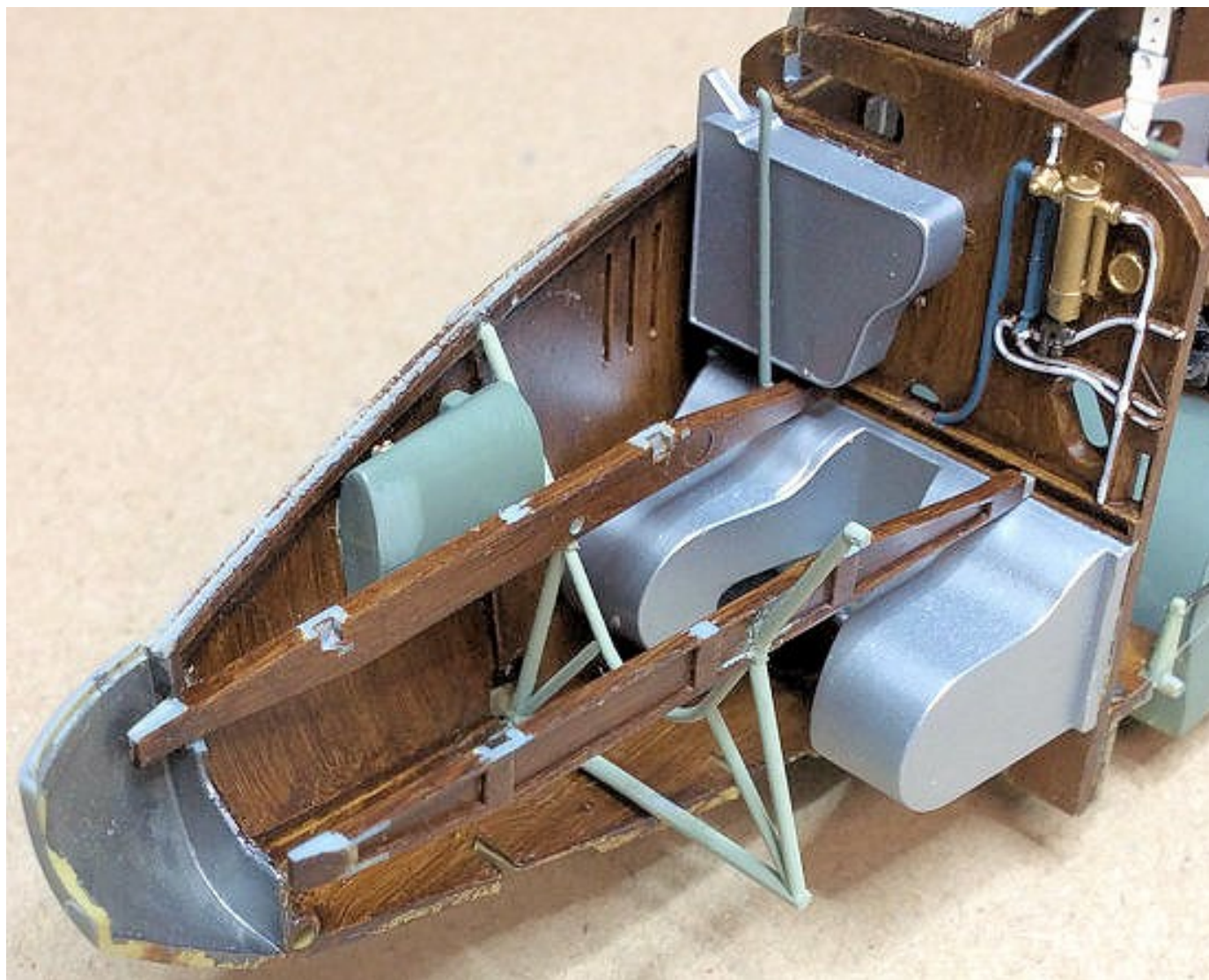
Cement the left engine bearer in position, making sure the two engine bearers are parallel to each other and aligned when viewed from the side.

Locate the fuselage left half fully onto the fuselage right side assembly.

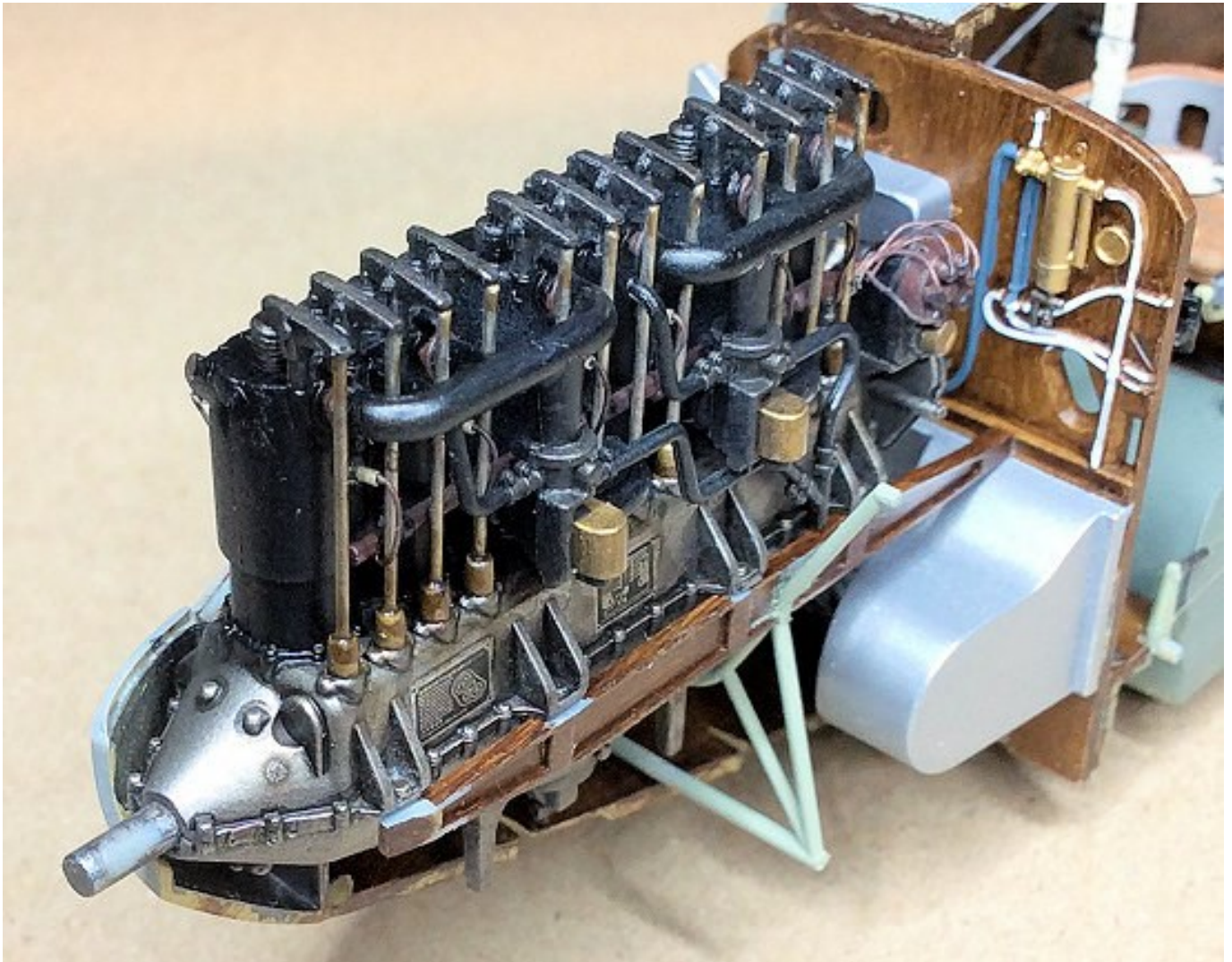
Make sure the two fuselage halves and cockpit assembly fully locate to each other. Also that the front end of the left engine bearer rest on the ledge of the front fuselage frame and the bearer support frame locates into the upper and lower locations on the right fuselage half.

Test fit the engine into its four locating recesses in the engine bearers. Make sure the engine fully locates onto the both bearers and is vertical in the fuselage when viewed from the front.

Remove the fuselage right half assembly.



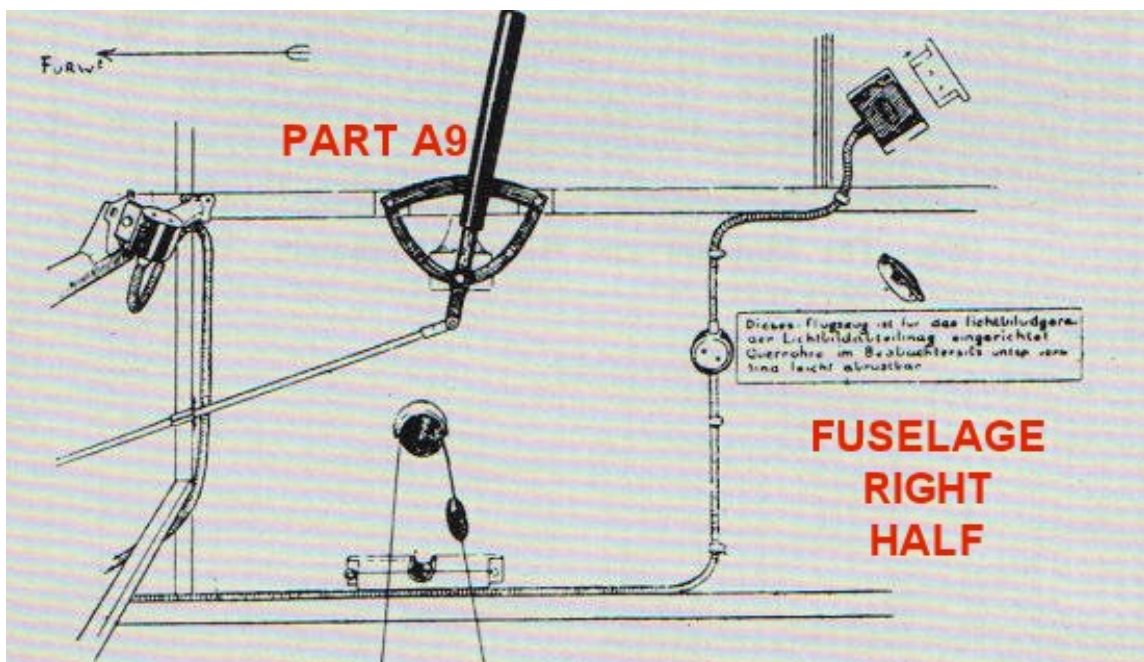




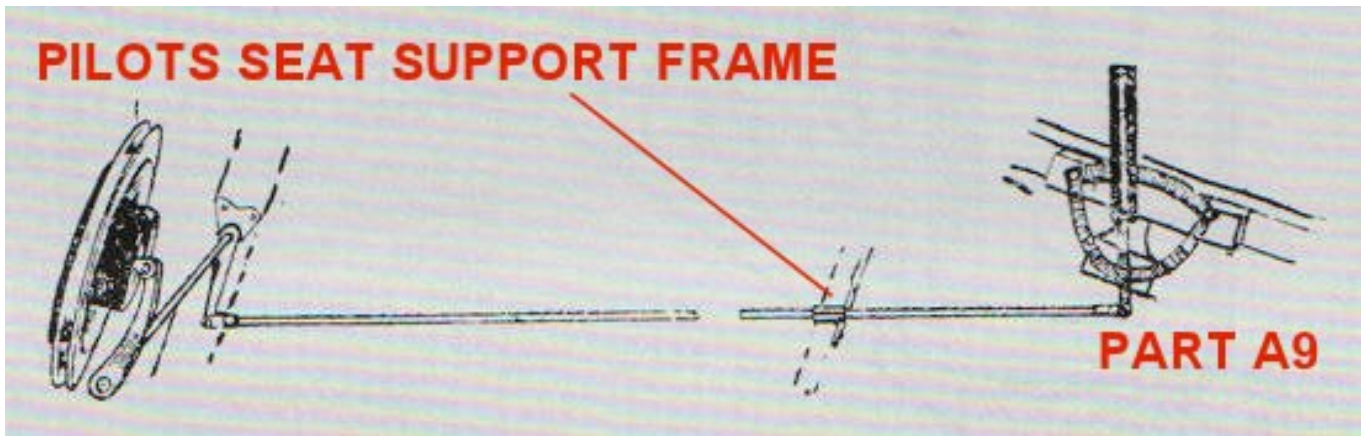
**Enhancements (continued):**

**NOTE:** *The following enhancements are desired, but not required. You may wish not to carry out these enhancements. Refer to pages 6 and 7 of the kit instruction manual.*

**Wireless Clutch control:**







Cut a long length of 0.4 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST04 or similar.

Trim the length of the tube such that it fits between the bottom of the clutch lever (A54) and under the front of the hand pressurization pump (fuselage right side assembly).

Flatten one end of the tube.

Pass the tube through the pilot's seat support frame with the flattened end towards the clutch control (A59).

Position the tube with its bottom end under the front of the hand pressurization pump and its top flattened end on the bottom of the clutch lever (A59).

Use thin CA adhesive to secure the tube to the fuselage side and the control lever.



### **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 (ALC-311) or similar.

Refer to Part 3 (Weathering) of this build log for more information.

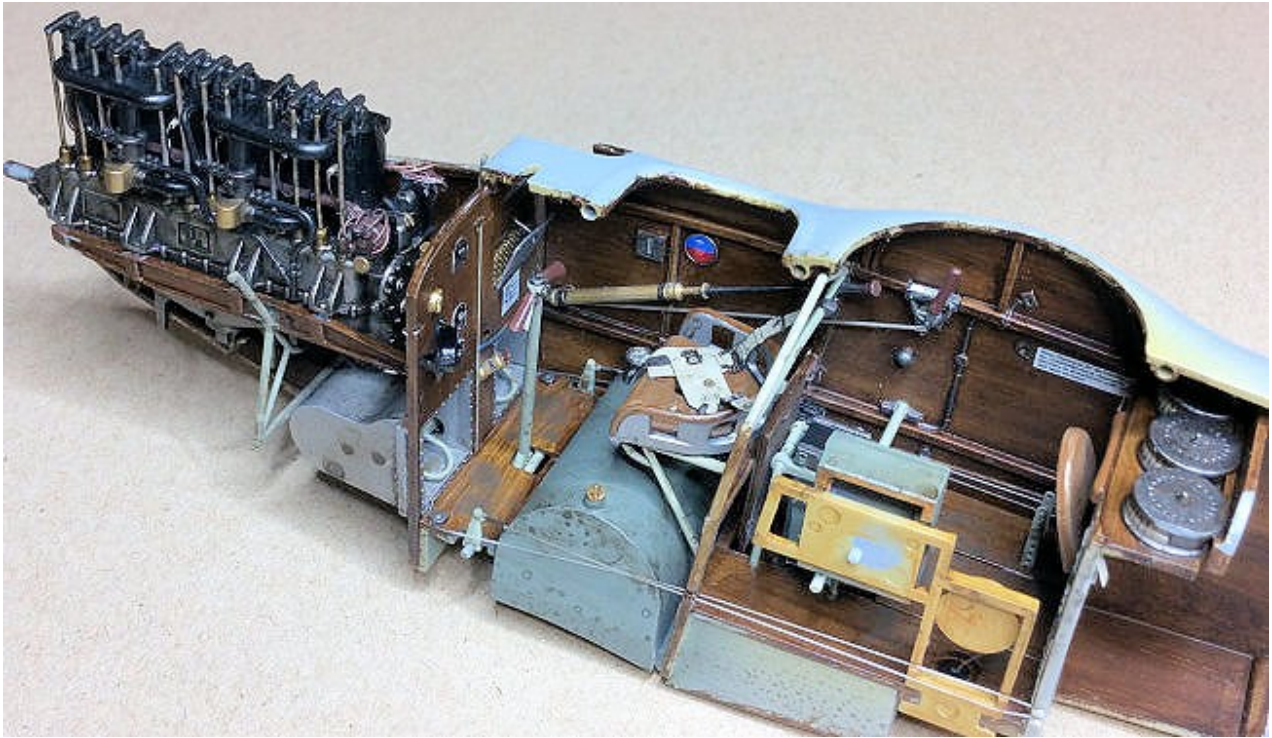
I applied 'Flory Models' Dark Dirt fine clay wash around the engine bay area of both fuselage sides and over the cockpit assembly.

I applied 'Flory Models' Grime fine clay wash onto the 'foot fall' areas of the pilot and observer's cockpit floors.

To seal in the applied weathering, airbrush the treated areas with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.



Brush 'Tamiya' Clear Gloss (X22) or similar over the instrument decal 105 on the fuselage right half.



**Assembly (continued):**

**NOTE:** I decided to have the camera exposed through its opening in the underside of the fuselage. Therefore the cover panel (A49) was not used.

If desired, final check fit the two fuselage halves together, making sure the cockpit assembly locates fully onto the left fuselage half, especially at the locators at the wireless hand reel, pilots seat support frame and the elevator cross bar.

Cement the two fuselage halves together.

Once the cemented fuselage seam has fully set and if necessary, fill any gaps in the seam joints with a filler or such as 'Mr. Hobby' Mr. Surfacer 500 or 1000. Then when set, sand the filled seams to blend them together.

Cement the two louvred access panels (A8) into their recesses in the underside of the fuselage.

## **Enhancements (continued):**

### **Ailerons:**

**NOTE:** *If desired the ailerons can be angled in opposition, as could be found on actual aircraft.*

Centre point mark two locations along the leading edges of the two ailerons. The marks should be about one third distance in from the ends of the ailerons.

Using the marks as guides, drill holes of 0.8mm diameter into the ailerons, making sure the drill remains central to prevent it from 'breaking through' the sides of the ailerons.

Cut four short lengths of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's or similar. The rods should be long enough to be fully inserted into the drilled holes with approximately 4mm left protruding.

Secure the rods into the holes using thin CA adhesive.

Align the ailerons to their hinges on the upper wing halves and pencil mark the wings at the rod locations.

Using the marks as guides, centre point mark the rod locations into the trailing edges of the upper wing halves.

Using the marks as guides, drill holes of 0.8mm diameter into the wings, making sure the drill remains central to prevent it from 'breaking through' the sides of the wings.

Test fit the ailerons into their wings and carefully bend the ailerons at their rods to a slight angle and in opposite direction to each other.

Remove the ailerons from their wing halves.

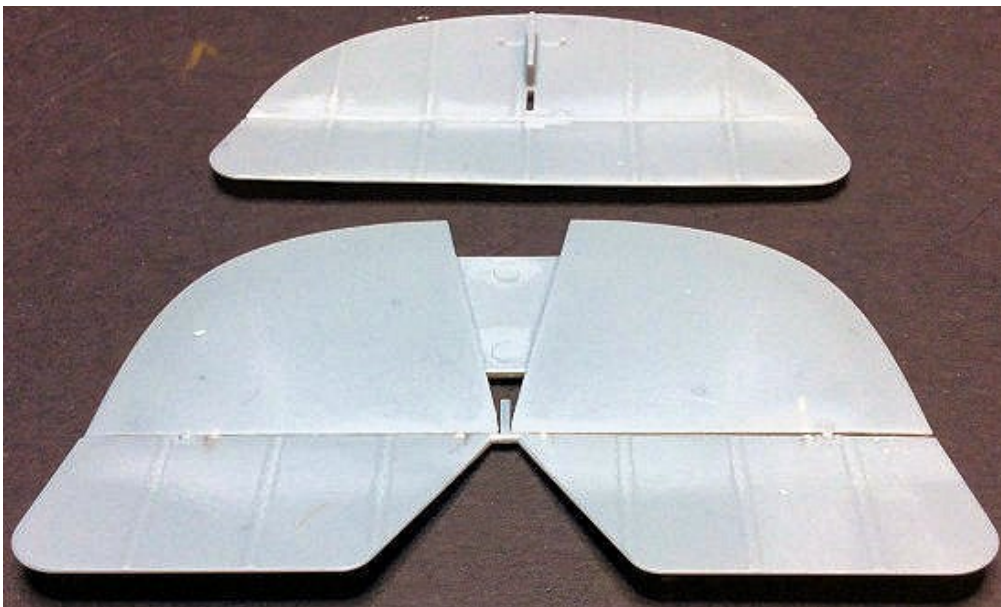
### **Upper tailplane/elevator:**

Using a sharp and suitable scribe, scribe along the underside of the upper tailplane along the seam between the tailplane and elevator. Make sure you don't separate the two parts.

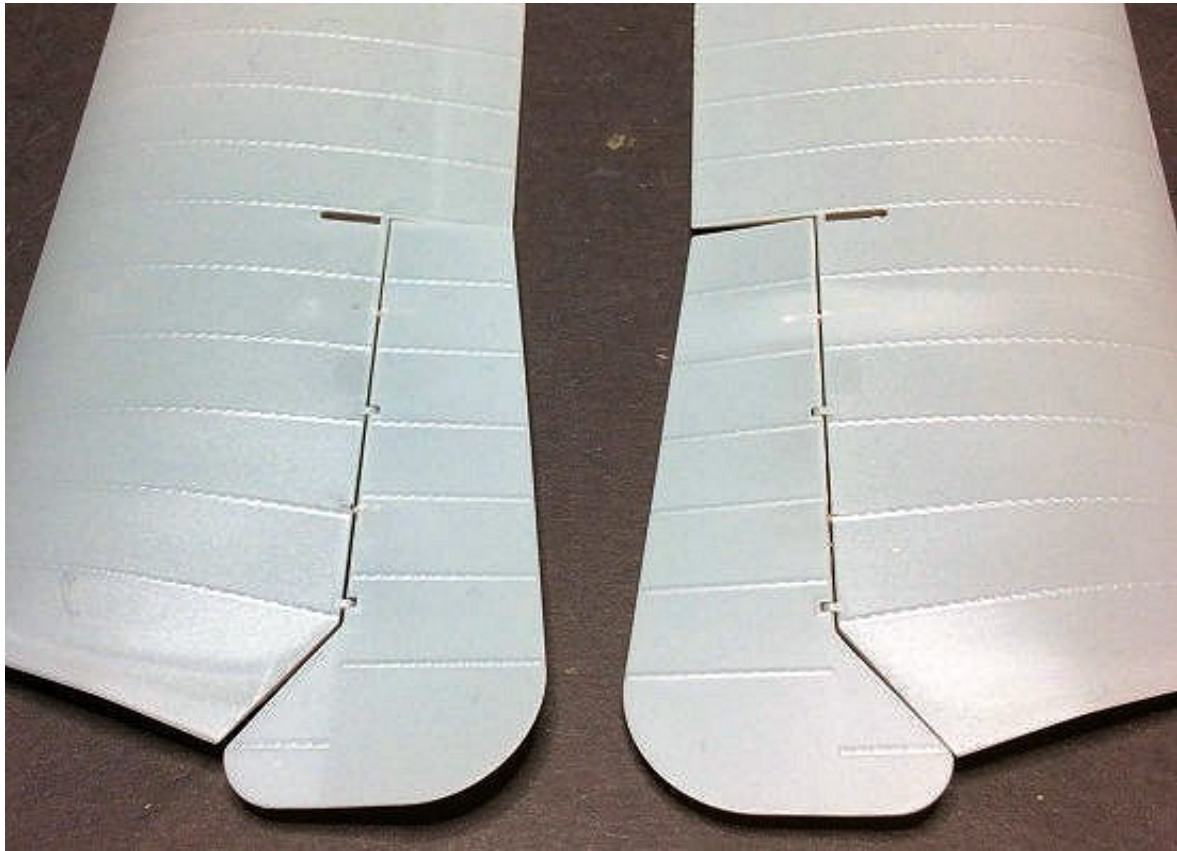
Carefully bend the elevator down at a slight angle.

### **Lower tailplane/elevator:**

Position the elevator on the tailplane following the same procedure used for the ailerons. Reduce the diameter of the drilled holes and rods to 0.5mm. The downwards angle the elevator should be the same as the upper elevator.







**Assembly (continued):**

Cement the two halves of the upper wing centre section (F2, F13) together.

**Painting (continued):**

Priming

**NOTE:** *The colour illustrations of this particular aircraft are on page 25 of the kit instruction manual.*

Mask off the fuselage assembly at the openings of the two cockpits and the engine bay area. I used thin rolls of 'UHU' White tack with infills of kitchen food wrap.

Mask off all other holes and openings with pushed in pieces of sponge (model parts packaging etc). Small holes can be temporarily blocked with the tips of wooden tooth picks.

Airbrush the following with a white primer, such as 'AK Interactive' White (AK759) or similar:

Fuselage and engine access panels A17, F5, F6, F7, F8 and F11

Both sides of the upper/lower wings

The two ailerons A3 and A5

Upper tailplane/elevator assembly A47

Lower tailplane/elevator assembly A4 and A46.

Rudder A48

Upper wing centre section assembly F2/F13.

Check that the surfaces are smooth and free from any surface imperfections. If necessary, lightly sand to achieve a smooth finish.



Pre-shading:

**NOTE:** *Pre-shading adds stains or shadows etc, before the colour top coat is applied. This will allow the pre-shading to slightly show through from under the applied top coat of paint.*

Temporarily fit the two lower wings into their locating slots in the fuselage.

Temporarily fit the lower tailplane into its locating slot in the rear of the fuselage.

Lightly Airbrush 'Tamiya' Smoke (X19) over the following areas of the model:

Around the leading and trailing edges on both sides of the upper and lower wings.

Along the wing ribs on both sides of the upper and lower wings.

Along the ribs on both sides of the upper and lower elevators.

Around the leading and trailing edges on both sides of the two ailerons.

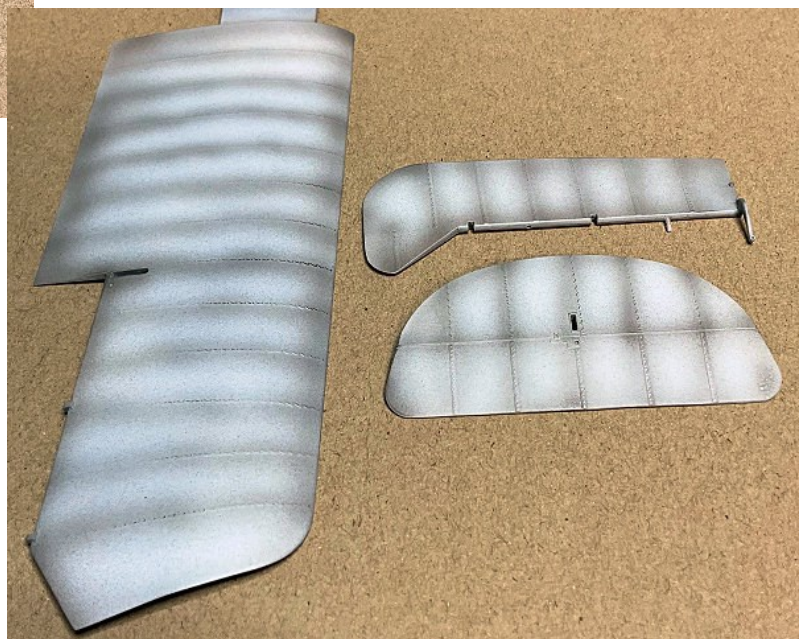
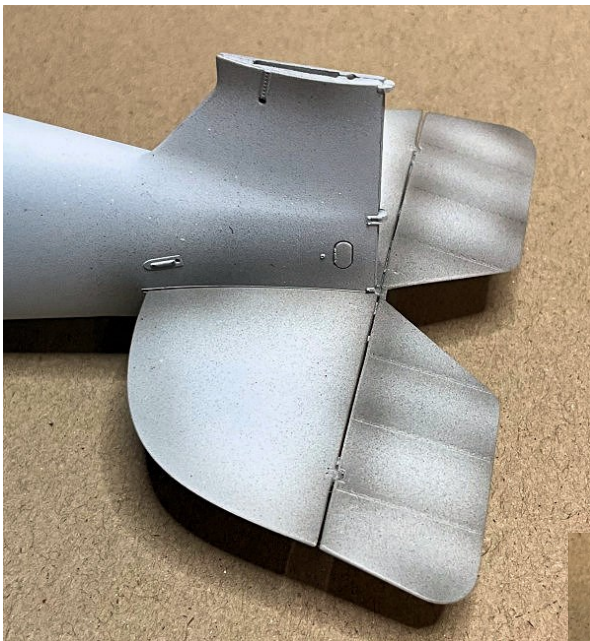
Along the wing ribs on both sides of the two ailerons.

Around the fuselage access panels and nose to fuselage joint.

Around the both sides of the fuselage to lower wing joints.

Remove the two lower wings from their locating slots in the fuselage.

Remove the lower tailplane from its locating slot in the rear of the fuselage.





Top colour:

**NOTE:** When applying the top colour coat over the model, make sure you airbrush lightly and if necessary with more than one coat. The intention is to colour the surface and in doing so, reduce the visibility of the pre-shading such that it is faintly visible, without being totally covered by the top coat.

Thin 'Hataka' Air Superiority Blue (C-155 - Orange line) with 'Mr. Colour' Self-levelling thinners (MLT) to a ratio of approximately 50/50.

**NOTE:** During the following step, do not airbrush too thick a coat of paint, otherwise the applied pre-shading will be totally covered.

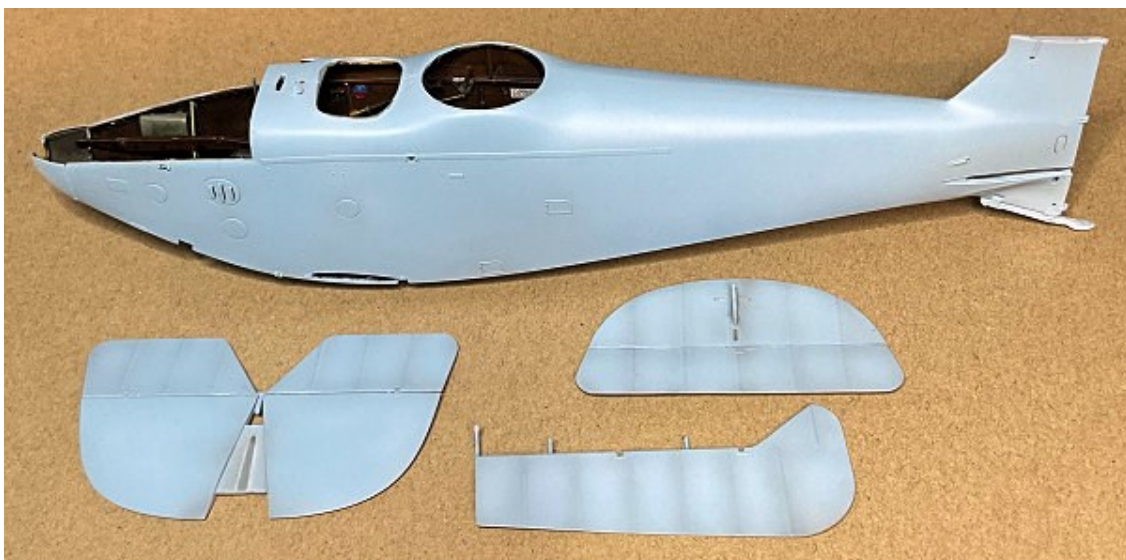
Airbrush a light coat of the paint over the fuselage, upper and lower wings, both ailerons and both tailplanes.

Allow the paint to start to dry then check the visibility of the pre-shading.

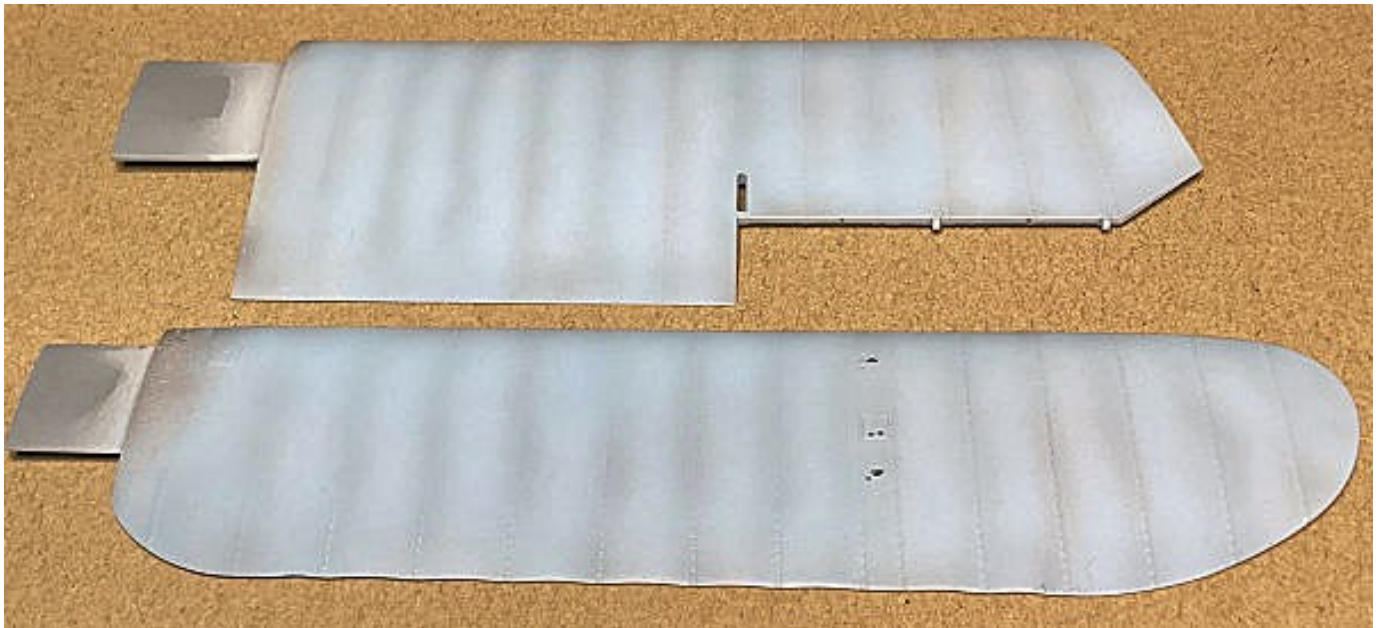
Repeat airbrushing over the parts to further reduce the visibility of the pre-shading.

Continue to check and if necessary airbrush, until the pre-shading is just visible under the top coat of paint.

Allow the paint to fully cure overnight.







### **Decals (continued):**

**NOTE:** *I applied the 'Aviatic' linen weave effect decals on the model later in this build and after the lower wing and upper and lower tailplanes were fitted. On reflection, it would be easier to apply the decals at this stage of the build and before assembly. For applying the decals, refer to page 85 of this build log.*

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

**NOTE:** *The pilots Spandau machine gun was prepared in Part 9 (Weapons) of this build log.*

Locate the two rear support legs of the Spandau machine gun assembly through the location opening in the top of the fuselage. Take care not to catch the rear legs on the open ammunition containing panel or the front legs on the fuselage side.

Fully locate the groove on the bottom of the breech block into its locating slot on the top of the instrument board.

Fully locate the longer rear support strut into its locating hole in the side of the instrument board.

Fully locate the longer front support leg into its hole in the right top side of the fuselage.

Make sure the weapon is vertical when viewed from the front and parallel with the fuselage when viewed from the side.

Cement the machine gun in position.

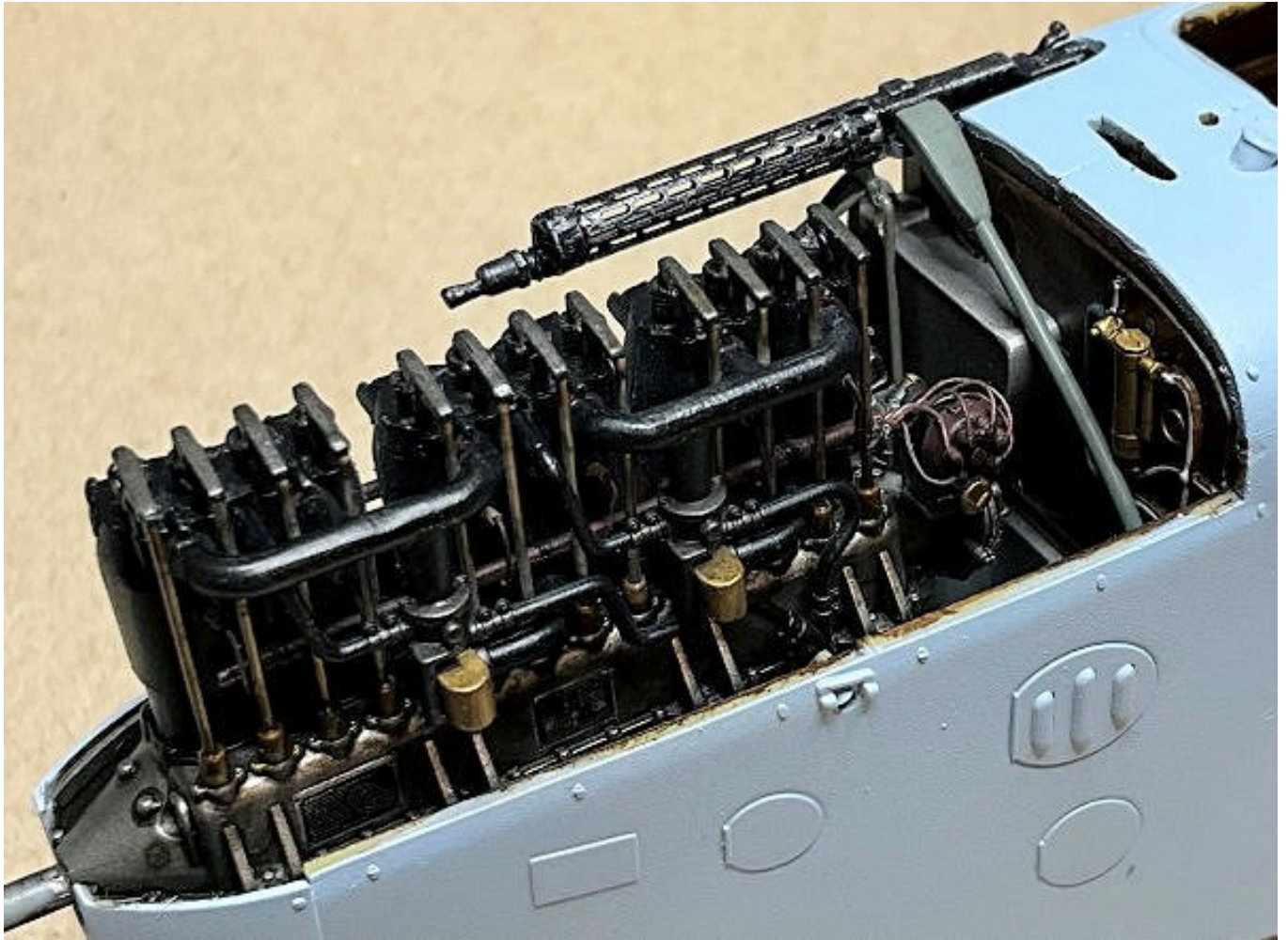
Cement the empty ammunition chute into its locating hole in the inboard side of the weapons breech block.

Cement the support rod from the rear of the right engine bearer onto its location on the top of the base for the forward support strut.

**NOTE:** *The engine assembly was prepared in Part 7 (Engine) of this build log. The two radiator pipes from the engine to the upper wing, will be fitted after the upper wing is fitted.*

Check fit the engine into its recesses in the two engine bearer, making sure it fully locates.

Cement the engine to the two engine bearers.





Cement the Tachometer (A53) into its locating hole forward from the pilots cockpit.

Dry fit the two landing gear struts (A31, A32) into their locating recesses in the underside edges of the fuselage, making sure they fully locate.

Locate the landing gear axle (A56) fully into its recesses in the landing gear struts.

Using the pre-moulded recesses at the ends of the axle bracing bar (A55) as guides, drill holes of 0.3 mm diameter through the bracing bar (for rigging later in this build).

Locate the landing gear bracing bar (A55) into its locating holes in the landing gear struts with the pre-moulded rigging recesses uppermost.

Cement the axle and bracing bar into the landing gear struts and leave to allow the cement to set, then carefully remove the landing gear assembly from the fuselage.

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

**NOTE:** Refer to the relevant pages and page 25 of the kit instruction manual.

*Before painting, airbrush the parts first with a grey primer (unless otherwise stated), such as 'AK Interactive' Grey (AK758) or similar.*

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

- The insides of the engine access panels

- The top and underside of the radiator for the upper wing centre section.

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

- The insides of the engine access panels.

Airbrush the following with 'Alclad' Steel (ALC112) or similar:

- The top and underside of the radiator for the upper wing centre section.

Airbrush the following with a white primer, such as 'AK Interactive' White (AK759) or similar:

- The four wing interplane struts

- The wheel inner and outer covers (D5, D7).

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

- Top elevator control horn and rudder control horn

- Outsides of engine access panels

- Fuselage nose cowl (mask off)

- Fuselage cabane struts (x2)

- Landing gear assembly

- Fuel tank for top and underside on upper wing (mask off)

- Tailplane support struts (x4).

Brush paint the foot boards on the inboard, upper surface of the lower wings with 'Mr. Colour' Stainless Steel (213) or similar.

Brush paint the fuselage Tachometer with 'Tamiya' Semi-gloss Black (X18) or similar.

Brush paint the fuel filler cap on the upper wing centre section with 'Mr. Colour' Brass (219) or similar.

Brush paint the bungee suspension cords on the ends of the landing gear axle and the ammunition belt of panel A17 with 'Tamiya' Buff (XF57) or similar.

Brush paint the fuel pipes on the left cabane strut with 'Tamiya' Deck Tan (XF55) or similar.

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

Axle retaining hoops on the bottom of the landing gear struts

Retaining straps around the fuel pipes on the left cabane strut.

Brush paint the padding around the pilots cockpit with 'AK Interactive' Brown Leather (AK3031) or similar.

Brush paint the following with 'Tamiya' RLM Grey (XF22) or similar:

Fuselage access panels, louvres, control cable ports, foot steps and metal fittings  
(mask off as necessary)

Control horns on ailerons

Aileron hinges on the upper wing halves

Elevator hinges on the upper and lower tailplanes

Lower wing access panels at the foot boards and the aileron cables access panels

Brush paint the tail skid as follows:

Tail skid - 'Tamiya' Dark Yellow (XF60) or similar.

Tail skid wood effect - For this step, refer to Part 2 (Wood Effects). Apply wood effects to the tail skid. I used 'Windsor & Newton' Griffin Alkyd Vandyke Brown oil paint.

Metal shoe - 'Mr. Colour' Stainless Steel or similar.

Bungee suspension cords - 'Tamiya' Buff (XF57) or similar:

Metal bracket - 'Tamiya' RLM Grey (XF22) or similar.

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

Test fit the two lower wings into their locating slots in the fuselage, making sure they fully locate.

Test fit the lower tailplane assembly into its locating slot in the rear of the fuselage, making sure it fully locates and is horizontal to the fuselage when viewed from the rear and aligned with the lower wings when viewed from above.

Test fit the upper tailplane assembly into its locating slot in the top of the fin, making sure it fully locates and is horizontal to the fuselage when viewed from the rear and aligned with the lower tailplane assembly.

Cement the two lower wings into the fuselage.

Cement the lower tailplane assembly into the rear of the fuselage.

Cement the upper tailplane assembly into the top of the fin.

Cement the ammunition cover panel A17 onto its location on the fuselage side.

Cement the rear engine exhaust pipe E17 into its locating holes in the top right, rear of the engine.

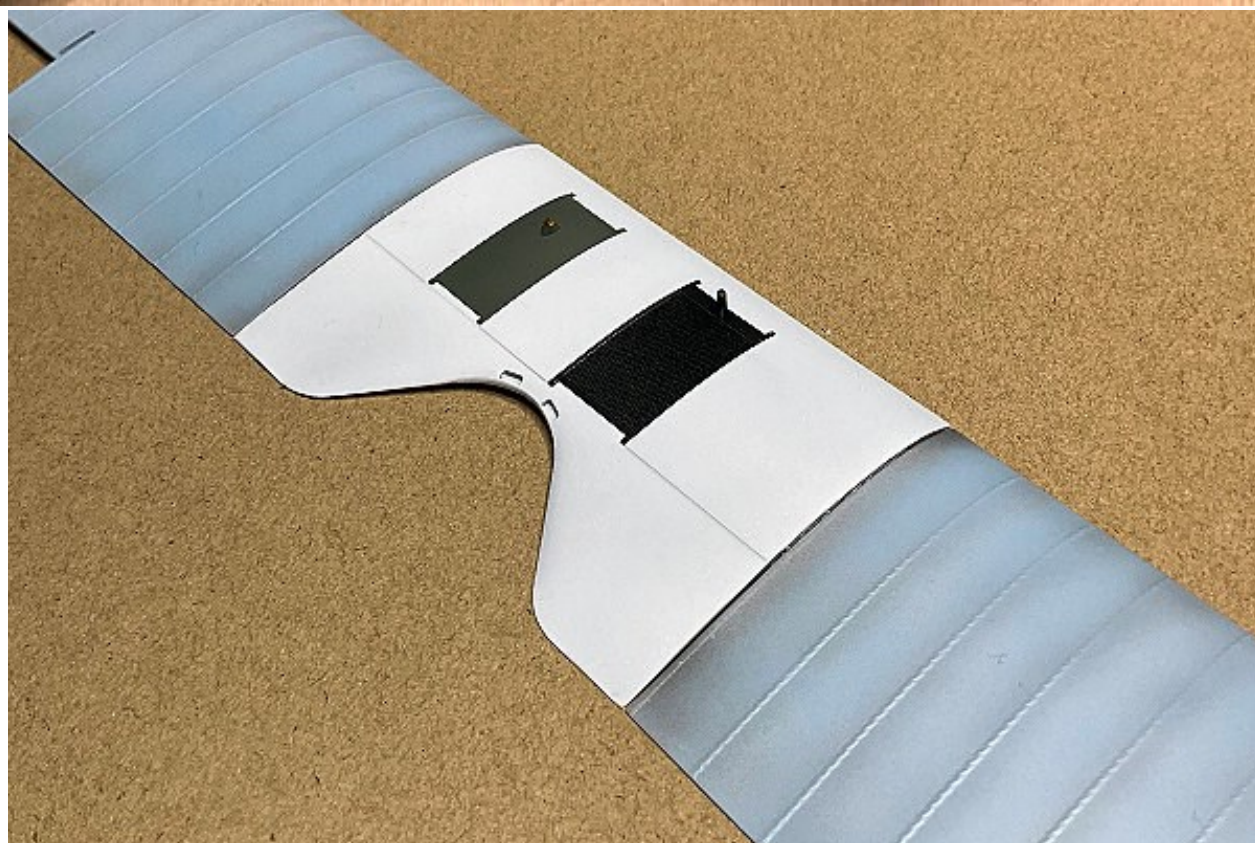
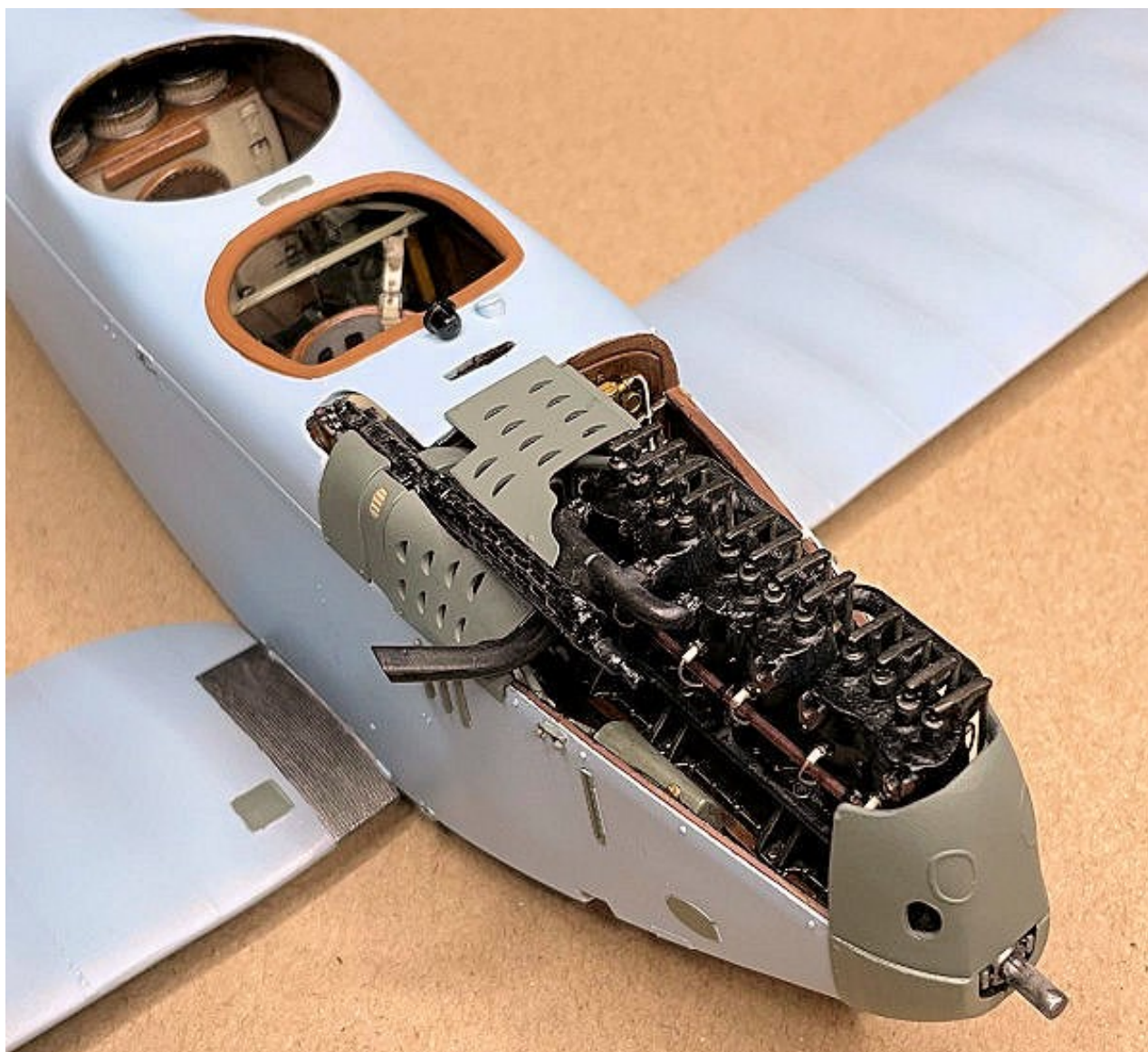
Cement the engine access panel F5 onto the fuselage side and over the rear engine exhaust pipe.

Thin the left edge of engine access panel F6 (used to join with panel F7) to a more realistic thickness.

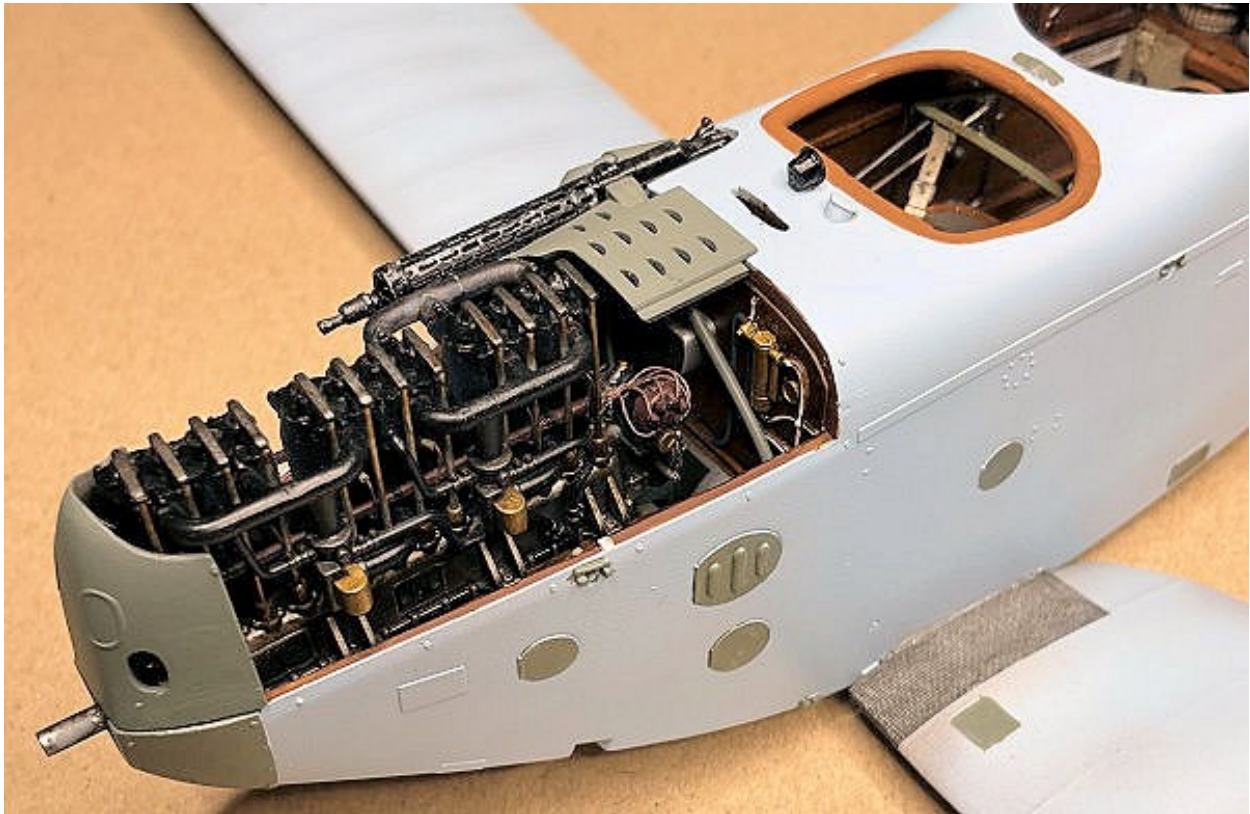
Cement the engine access panel F6 onto the top of the fuselage and under the cooling jacket of the Spandau machine gun.

Cement the upper nose cowl F11 onto the front of the fuselage and the lower nose cowl.

Cement the Tachometer A53 into its location hole in front of the pilots cockpit.







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

**NOTE:** *The following enhancement is desired, but not required. As there are no references available for how the throttle control and carburettor fuel supply pipe were configured. Therefore, I've based these on that of similar engines of that period. Refer to pages 7 and 10 of the kit instruction manual.*

#### **Throttle control:**

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

Cut a long length of blackened 0.3 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST03 or similar.

Pass the tube, from inside the pilots cockpit, through the throttle control opening in the left side of the instrument board and into the left side of the engine bay.

Using CA adhesive, secure the cockpit end of the tube to the throttle control lever (A45) on the inside left of the pilots cockpit.

From inside the engine bay, bend the tube upwards and towards the rear carburettor float chamber on the engine.

Remove two suitable control horns from the 'PART' 1:48th scale control horns (PRT-S48-087) sheet.

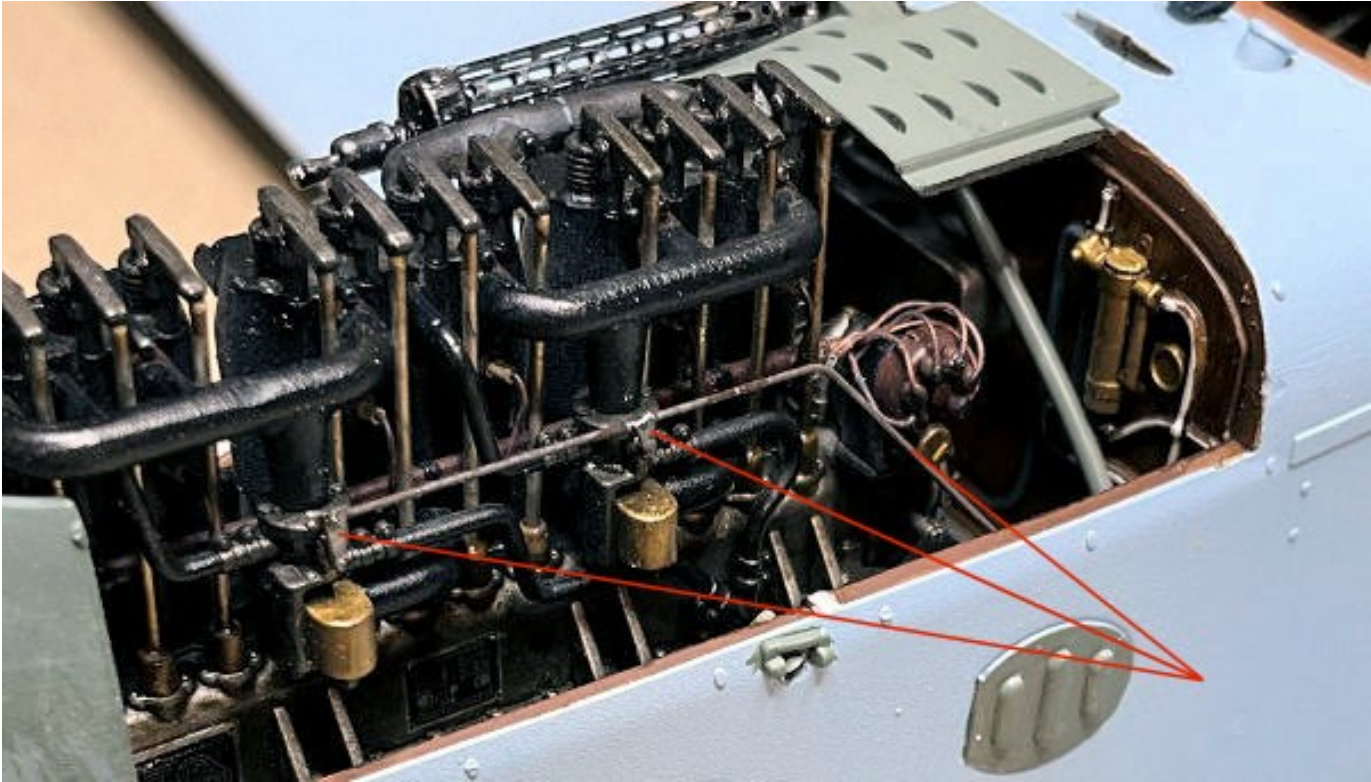
Using CA adhesive, secure the control horns onto the circular stubs above the carburettor float chambers, making sure they are both positioned at the same angle.

Bend the tube in the engine bay horizontal and aligned with the top of the two control horns.

Cut away the excess tube at the front control horn.

Using CA adhesive, secure the tube in position onto the rear of the two control horns.





### Carburettor fuel supply pipe.:

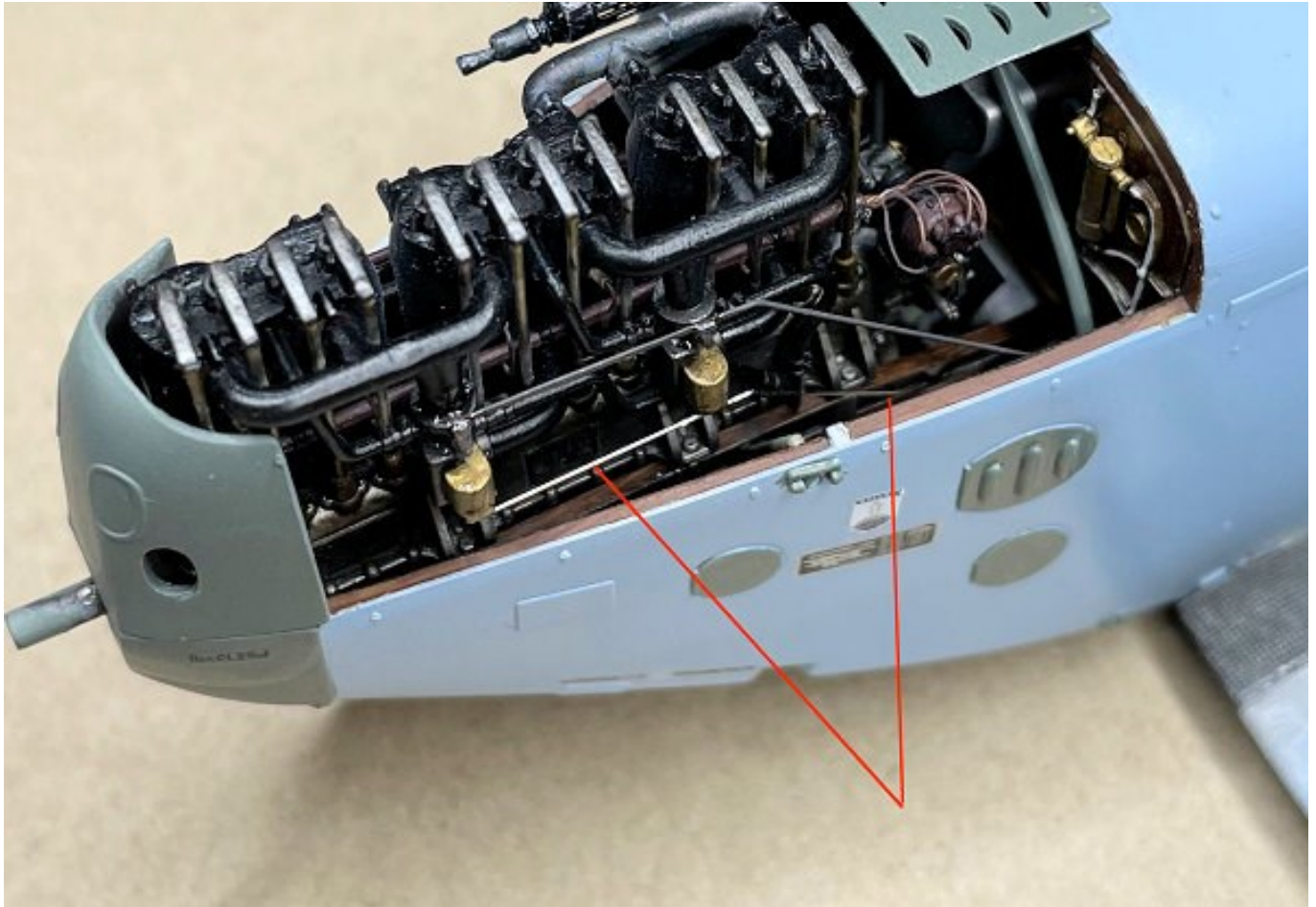
Cut a long length of blackened 0.3 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST03 or similar.

Align one end of the tube with the front of the forward carburettor float chamber.

Just past the rear of the back carburettor float chamber, bend the tube downwards at an angle.

Check locate the tube on the underside of the two carburettor float chambers, with the bent end projecting down towards the fuel tank at the bottom, rear of the engine bay.

Using CA adhesive, secure the tube in position onto the undersides of the two carburettor float chambers.



### Decals (continued):

Preparation:

**NOTE:** *The following step is required to provide a gloss and smooth surface for applying decals.*

Airbrush a gloss clear coat, such as 'Alclad' Aqua Gloss 600 or similar, over the following:

- Both sides of the outer halves of the upper.
- Both sides of the lower wings
- Both sides of the two ailerons
- Both sides of the lower elevator
- Both sides of the upper elevator
- Both sides of the rudder
- The outer and inner wheel covers.

Check that the surfaces are smooth and free from any surface imperfections. If necessary, lightly sand then re-apply a layer of gloss clear coat.

**NOTE:** Refer to Part 4 (Decals) of this build log for more information. The 'Aviatic' linen weave effect (ATT32236) decals used to cover the wings and tailplane are 'clear' backed and are translucent. Therefore the colour of the base coat under needs to be a light shade, such as white, light grey or tan. However this particular aircraft is pale blue, which is a good base colour anyway for the linen effect decals.

The 'Aviatic' decals **are not** 'cookie cut' to the required shapes, but are part of the overall carrier film on the sheet. Therefore you will need to carefully cut the individual decals from the sheet, using the models parts as the shape and size guides.

Apply a decal to one side of the part first. Then, once the decal has fully dried and set, carefully sand away any decal overhang from the edges of the part before applying decal to the other side.

#### Wings:

**NOTE:** The centre section of the upper wing upper was covered with 1.6mm thick plywood. Generally it was painted similar to that scheme used for the wings etc. However, the centre section on this particular aircraft was painted white. Therefore the centre section does not require linen weave effect decal.

Lay the upper wing right half (top surface uppermost) onto the back of the decal sheet and pencil trace the outline of the wing.

Cut the decal shape from the sheet.

Check that the cut decal aligns with the wing.

Apply the decal to the underside of the right upper wing half.

Use the same procedure to apply a decal to the underside of the left upper wing.

Lay the upper wing right half (underside uppermost) onto the back of the decal sheet and pencil trace the outline of the wing.

Cut the decal shape from the sheet.

Check that the cut decal aligns with the wing.

Apply the decal to the top surface of the right upper wing half.

Use the same procedure to apply a decal to the top surface of the left lower wing.

#### Ailerons:

Use the same procedure to apply a decal to the undersides of the left and right ailerons.

Use the same procedure to apply a decal to the top surfaces of the left and right ailerons.

#### Elevators:

Use the same procedure to apply a decal to the undersides of the left and right lower elevator.

Use the same procedure to apply a decal to the top surfaces of the left and right lower elevator.

#### Rudder:

Use the same procedure to apply a decal to both sides of the rudder.

#### Upper tailplane:

Use the same procedure to apply a decal to both sides of only the upper tailplane (the lower tailplane was plywood covered).



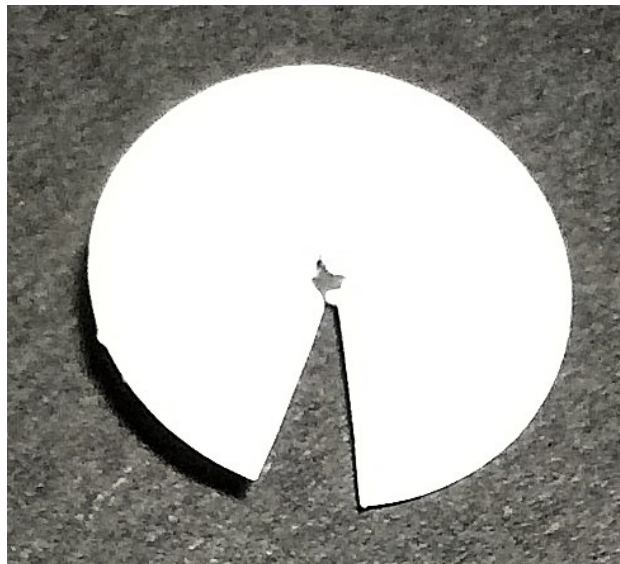
### Wheel covers:

**NOTE:** To cut these circular decals I used a 'Thinnerline' circle cutter, cutting paper templates to achieve the correct diameter needed for the decals.



Using the cutter I cut out two decals for the rear wheel covers and two decals for the front covers.

**NOTE:** The front wheel covers are slightly conical in shape. The decals need to be cut slightly larger in diameter than required then a section cut out. This will allow the decal to be applied to the conical surface with the cut sides butting against each other.



**NOTE:** The 'Aviatic' decals are quite strong and flexible enough to be able to push and position the decals prior to final fitting.

Apply the four decal discs to the wheels and covers.

### Fuselage:

**NOTE:** The fuselage was covered with 1.6mm thick plywood. Generally it was painted similar to that scheme used for the wings etc. However, this particular aircraft was painted overall with the light blue colour. Therefore the fuselage does not require linen weave effect decals.



Kit supplied decals:

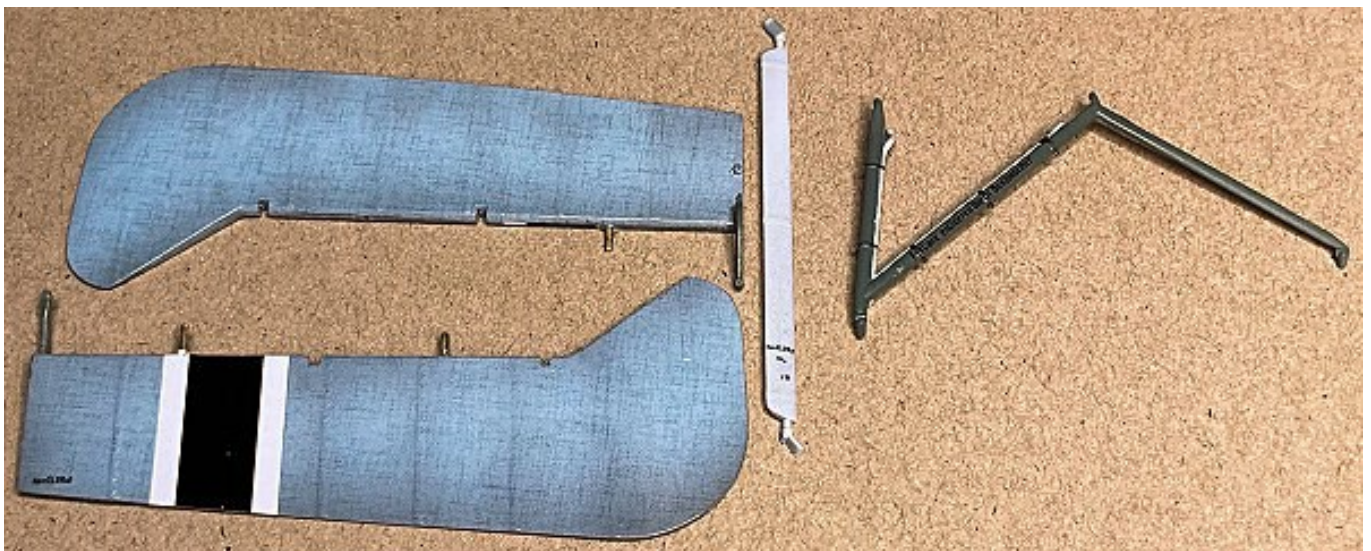
**NOTE:** *The kit supplied decals required for this model are (refer to pages 12, 13 and 25):*

- Fuselage mounted Tachometer 99*
- Fuselage mounted Manometer 101*
- Fuselage left cabane struts 82*
- Fuel tank (underside of upper wing centre section) 91*
- Fuselage nose cowl and engine access panel 65 (x4)*
- Fuselage 60, 61, 63 (x2), 64, 74, 75 (x4)*
- Rudder 62 (x2)*
- Upper wing 58, 59, 65 (x4), 71, 72*
- Upper wing centre section top 65*
- Lower wings 73*
- Upper tailplane top 65 (x2)*
- Lower tailplane top 65 (x2)*
- Bottom of rudder 65 (x2)*
- Bottom of forward interplane struts 67, 69*
- Bottom of rear interplane struts 68, 70.*

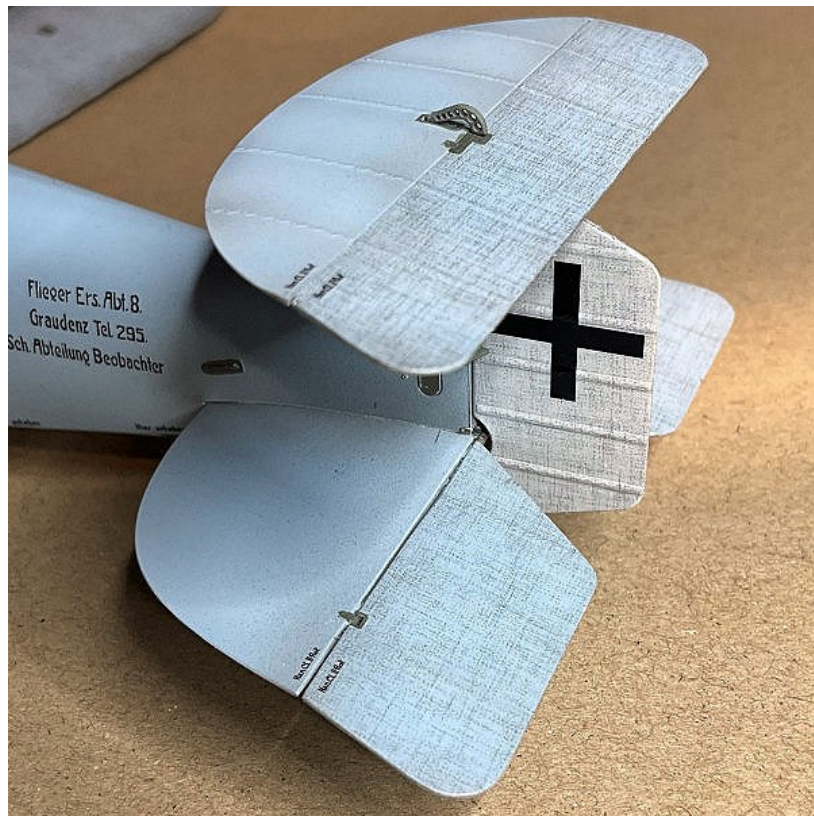
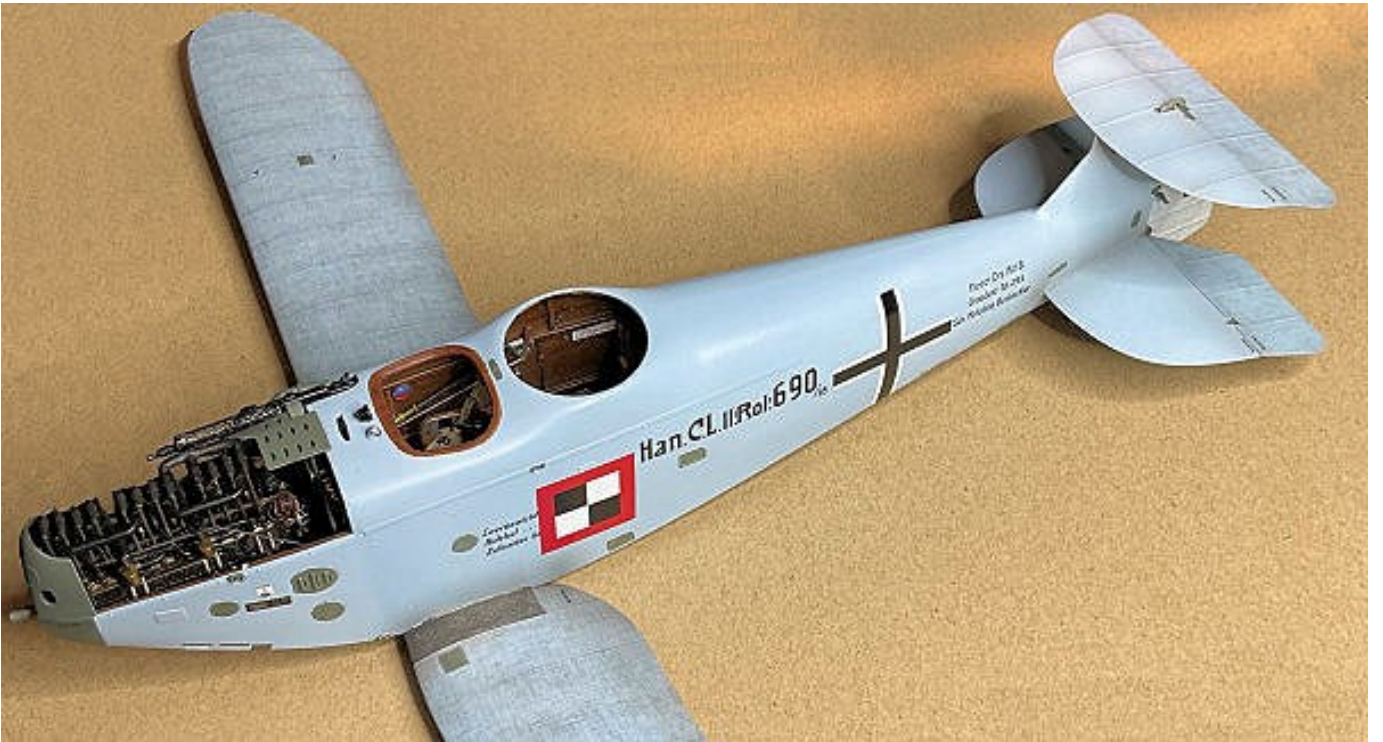
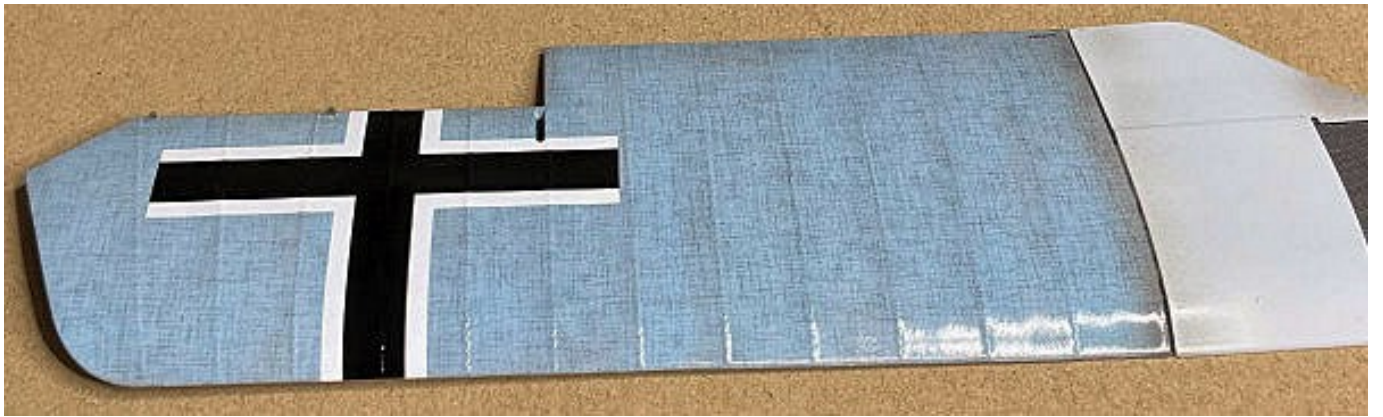
*For information on the placing of the various decals, refer to kit instruction manual, pages 10, 11 and 25. I found it easier to cut the fuselage side decals 64 and 74 into separate parts and to cut away as much of the carrier film as possible, to reduce the chance of 'silvering' under the clear carrier film.*

Apply the listed decals to:

- Upper and lower wings
- Ailerons
- Fuselage
- Rudder
- Upper and lower tailplane/elevators
- Interplane struts
- Cabane strut (left side F3)
- Engine access panels (F7 and F8).









## **Assembly (continued):**

### **Observers machine gun mounting:**

Drill through the pre-moulded recesses in the swivel ring (A38) for the grab handle, using a 0.4 mm diameter drill.

Bend a length of 0.3 mm diameter Brass tube, such as 'Albion Alloy's' MBT03 or similar, into a semi-circle where the legs fit through the pre-drilled holes in the swivel ring.

Cut the length of the legs such that when fully located in the holes, the ends of the legs do not protrude through the underside of the swivel ring.

Using thin CVA adhesive, secure the grab handle into the pre-drilled holes in the swivel ring.

Slightly bend the grab handle down into the swivel ring.

Clip the Parabellum machine gun mount (G4) on to its base (G9).

Locate the mount assembly into its locating hole in the swivel ring (A38).

Locate the butt rest (A28) into its locating hole in the swivel ring.

Locate the prepared Parabellum machine gun into the butt rest and resting on the top of the mount.

With the weapon aligning the butt rest and mount, cement the butt rest and mount base only into their locating holes in the swivel ring.

Remove the machine gun.



### Upper tailplane:

Cement the elevator control horn (A57) into its locating hole in the top of the fin.

Hold a longer tailplane support strut (D14) against the rear edge of the fin and the under side of the upper tailplane (rear edge).

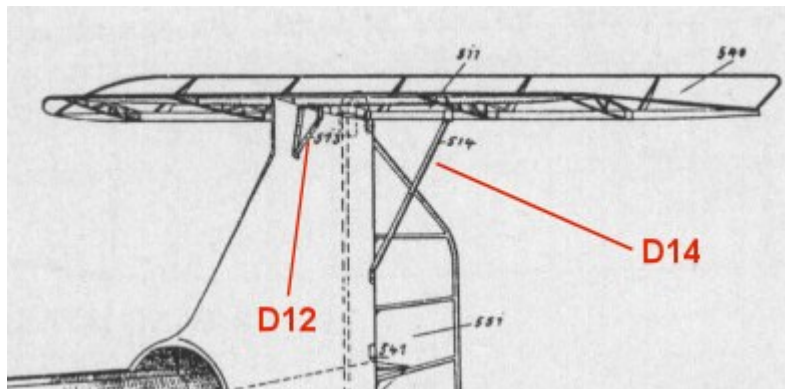
Point mark the fin at the bottom of the strut.

Use a 0.7 mm diameter drill to drill through the fin at the point mark.

Cut away the small locating stub on the top of the two strut D14.

Cement the struts into the pre-drilled hole and the underside of the upper tailplane.

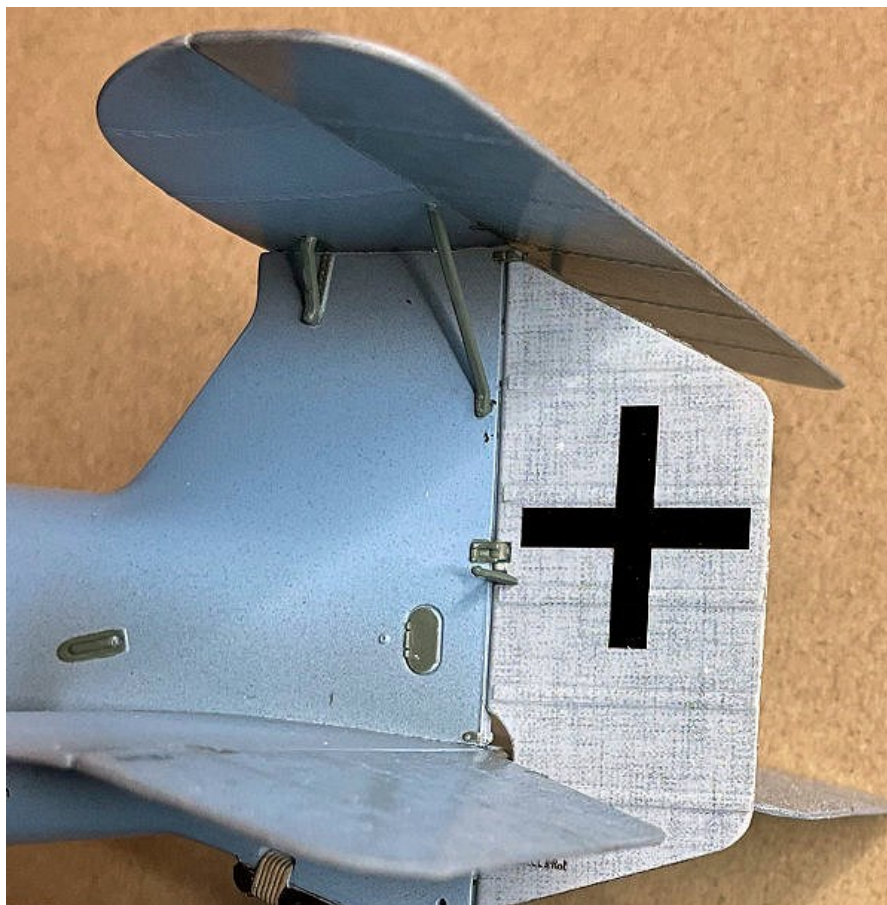
Cement the two shorter support struts (D12) into their locating hole in the fin and recess in the underside of the upper tailplane.



Drill a hole of 0.2 mm diameter through the ends of the rudder control horn (A6).

Cement the rudder control horn into its locating slot in the rudder leading edge.

Cement the rudder into its two locating slots in the rear of the fin.





### Radiator shutter:

Remove the photo-etch shutter (P13) from the kit supplied sheet.

Cut away ant photo-etch tags from the ends of the six 'legs'.

**NOTE:** Refer to page 13 of the kit instruction manual.

Bend the six legs to 90 degrees at the outer edge of the shutter ring.

Run a 0.5 mm diameter drill into, **but not through**, the six pre-moulded holes for the shutter in the underside of the upper wing centre section.

Check fit the legs of the shutter into the holes making sure the shutter locates correctly.

### **Weathering (continued):**

To provide a good base for weathering and to seal in applied decals, airbrush the following parts with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar:

Fuselage, including tailplanes/elevators, rudder.

Engine access panels F7 and F8

Both sides of the upper and lower wings

Both sides of the two ailerons

Interplane struts

Cabane struts

Outer and inner wheel covers.

**NOTE:** Refer to Part 3 (Weathering) of this build log for more information.

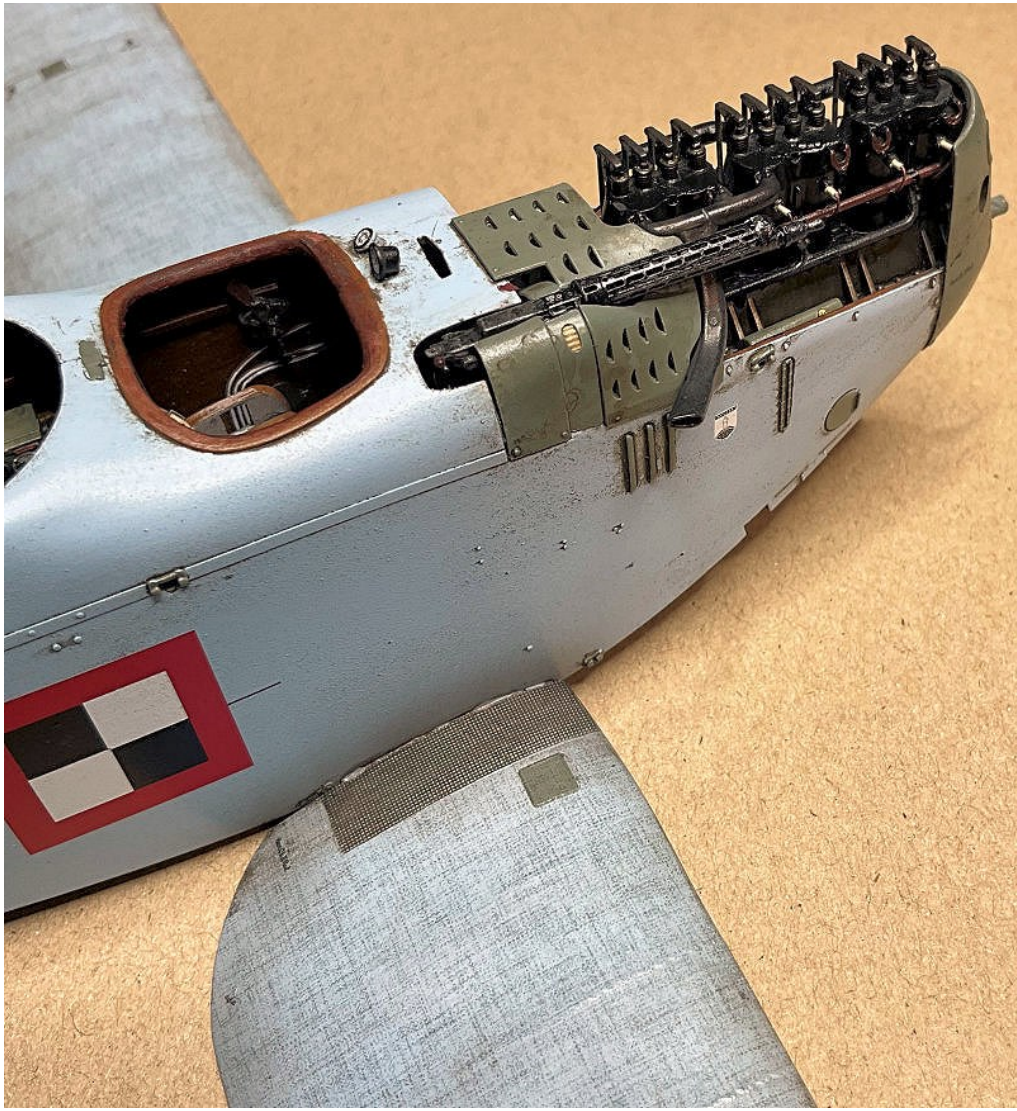
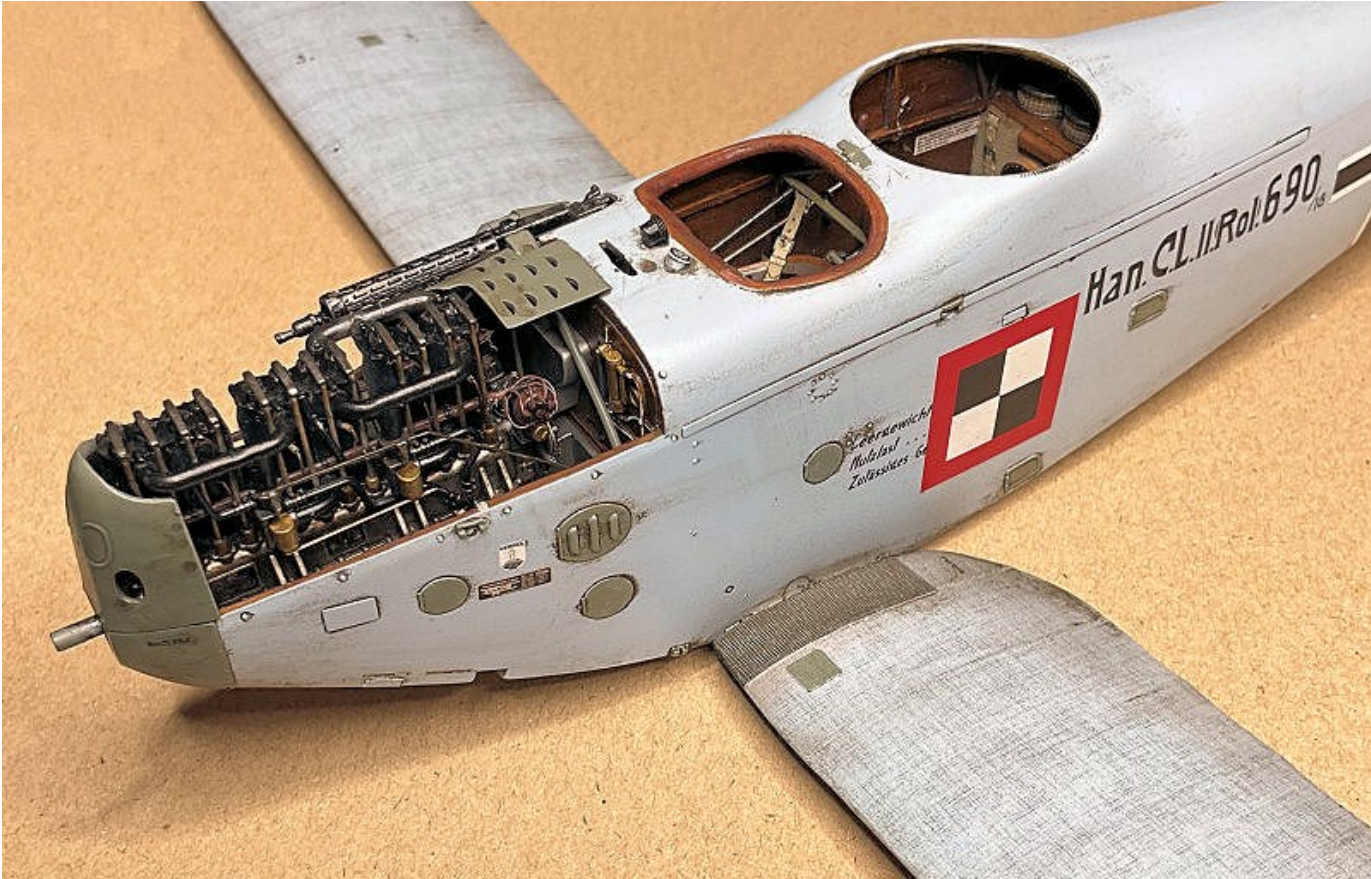
I applied 'Flory Models' Dark Dirt fine clay wash.



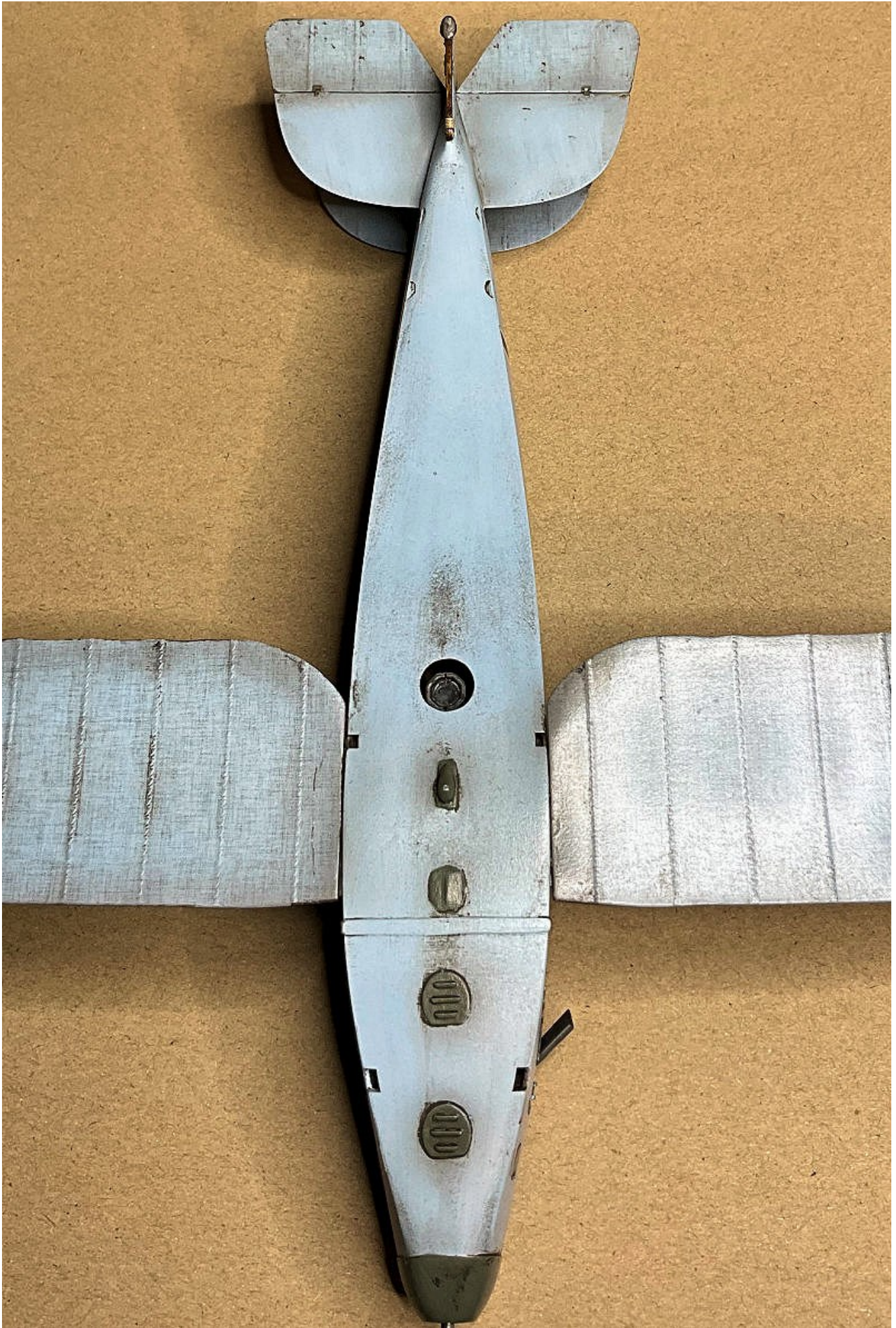
Remove the wash as necessary to achieve the desired weathered effect.

To seal in the applied weathering, airbrush the treated areas with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

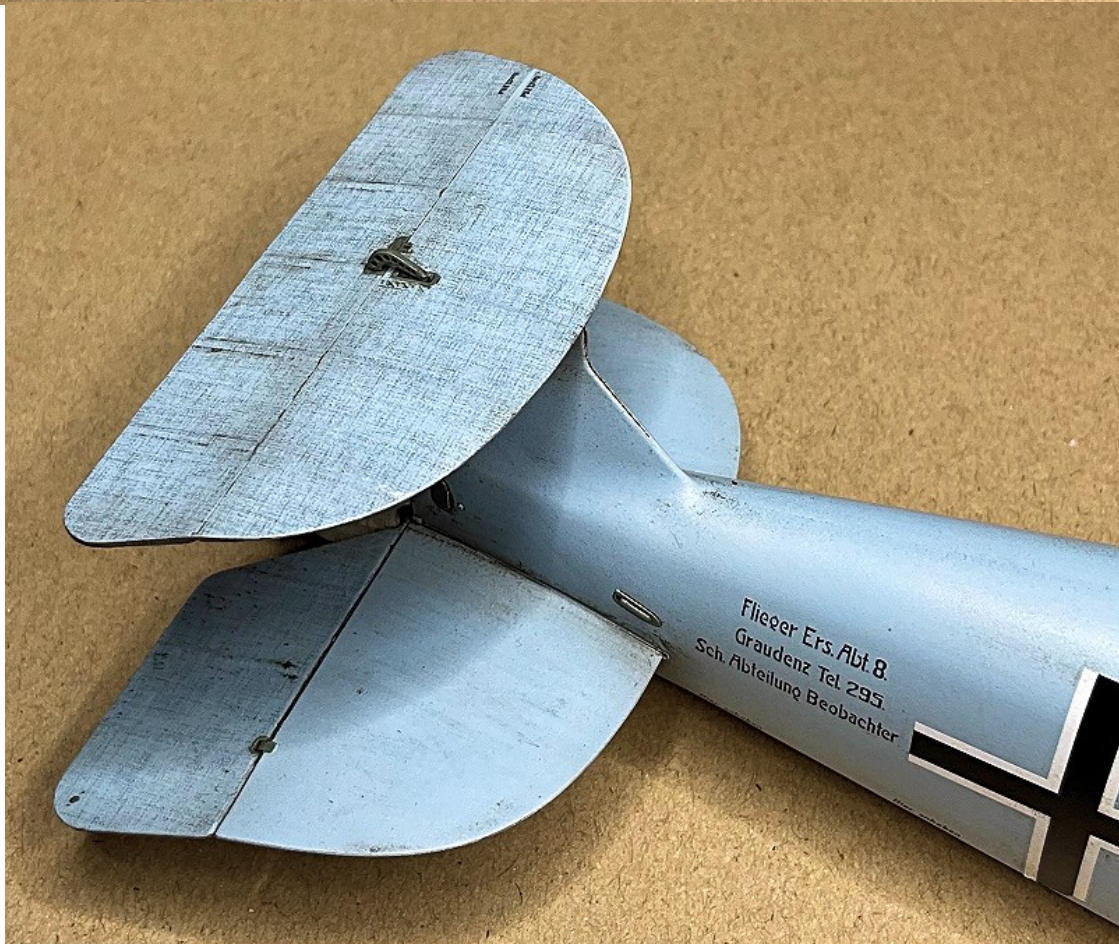














## **Assembly (continued):**

### **Generator:**

**NOTE:** *The mounting bracket for the generator was secured to the strut with two straps, which are not represented in the kit. Therefore the generator mounting bracket (A43). Instead, lead wire straps will be fitted later, in chapter Phase 2 of this build.*

Cement the two halves of the generator body (G74 and G76) together.

Fill the recesses in the base of the generator with modelling putty, such as 'AV' Masilla Plastica (401) putty or similar.

Once the filler has fully set, sand it flush with the base plate.

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

#### **Observers gun mount:**

Unclip and remove the dry fitted swivel mount (G4) from its base (G9) on the swivel ring (A38) for the Parabellum machine gun.

Airbrush the swivel ring and swivel mount with a grey primer, such as 'AK Interactive' Grey (AK758) or similar'.

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

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

Airbrush the swivel mount (G4) with 'Tamiya' RLM Grey (XF22) or similar.

Brush paint the butt rest (A28), added grab handle and swivel ring lock handle with 'Tamiya' RLM Grey (XF22) or similar.

Brush paint the end on the swivel ring lock handle with 'Tamiya' Hull Red (XF9) or similar.

Clip the swivel mount (G4) onto its base (G9) on the swivel ring (A38) for the Parabellum machine gun.

Airbrush the gun mount assembly with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

#### **Wireless generator:**

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

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

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

Airbrush the generator body with 'Tamiya' RLM Grey (XF22) or similar.

#### **Wireless aerial:**

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

Airbrush with 'Tamiya' RLM Grey (XF22) or similar.

Brush paint the aerial weighted end with 'Mr. Colour' Stainless Steel (213) or similar.

Airbrush the aerial with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.



#### Radiator shutter:

Brush paint the photo-etch radiator shutter with 'Mr. Colour' Metal Primer R or similar.

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

Airbrush with 'Tamiya' RLM Grey (XF22) or similar.

Airbrush the shutter with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

#### Wheel tyres:

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

Airbrush with 'Tamiya' Rubber Black (XF85) with IJN Grey (XF75) to approximately 40/60% ratio mix.

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

##### Radiator shutter:

Check that the six pre-bent legs of the radiator shutter locate fully into the six locating holes on the underside of the upper wing centre section. If necessary, drill out the holes using a 0.5 mm diameter drill to achieve the correct fit.

***NOTE:*** During the following step, make sure the open section of the shutter is positioned over the radiator grill.

Secure the radiator shutter into its six locating holes using thin CA adhesive.

Cement the rear wheel covers into the recesses in the two wheels.

Fully locate the wheels onto the ends of the landing gear axle.

Clip the wheel retainers (G20) over their recesses in the ends of the landing gear axle.



**NOTE:** *This model will have the wheels secured to the axle (not free to rotate).*

Cement the wheel retainers to the axle ends and rear wheel covers.

Cement the outer wheel covers into their recesses in the two wheels.

Cement the landing gear struts fully into their locating slots in the underside outer edges of the fuselage.

**Painting (continued):**

**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 following with 'Mr. Colour' Super Iron 2 (SM203) or similar:

The radiator shutter on the underside of the upper wing centre section.

The top and underside the of the fuel tank in the upper wing centre section.

Brush a small amount of 'AK Interactive' Kerosene wash (AK2039) on the rear of the fuel tank filler on the top surface of the upper wing.

**Decals (continued):**

Airbrush the generator assembly with a clear gloss coat, such as 'Alclad' Aqua Gloss 600 or similar.

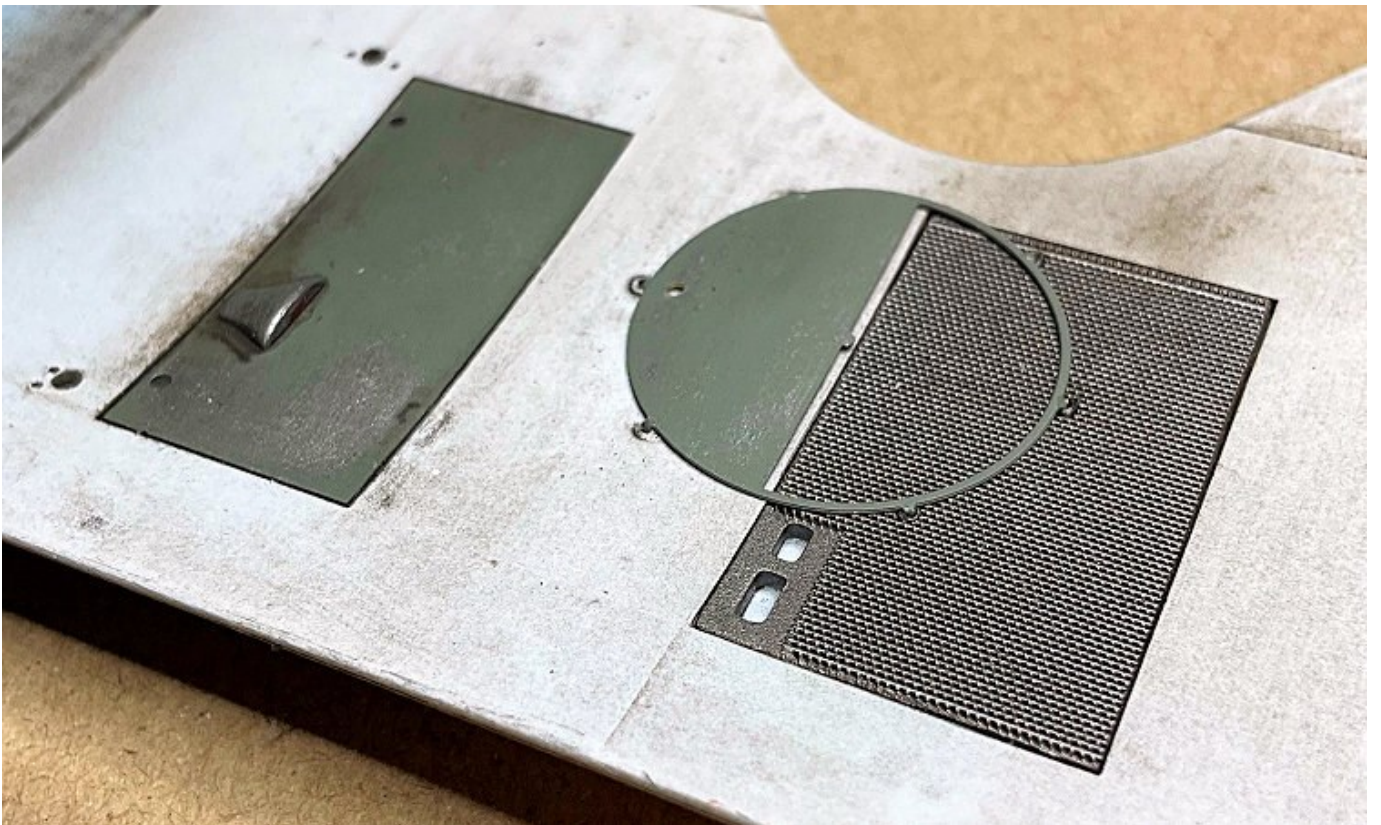
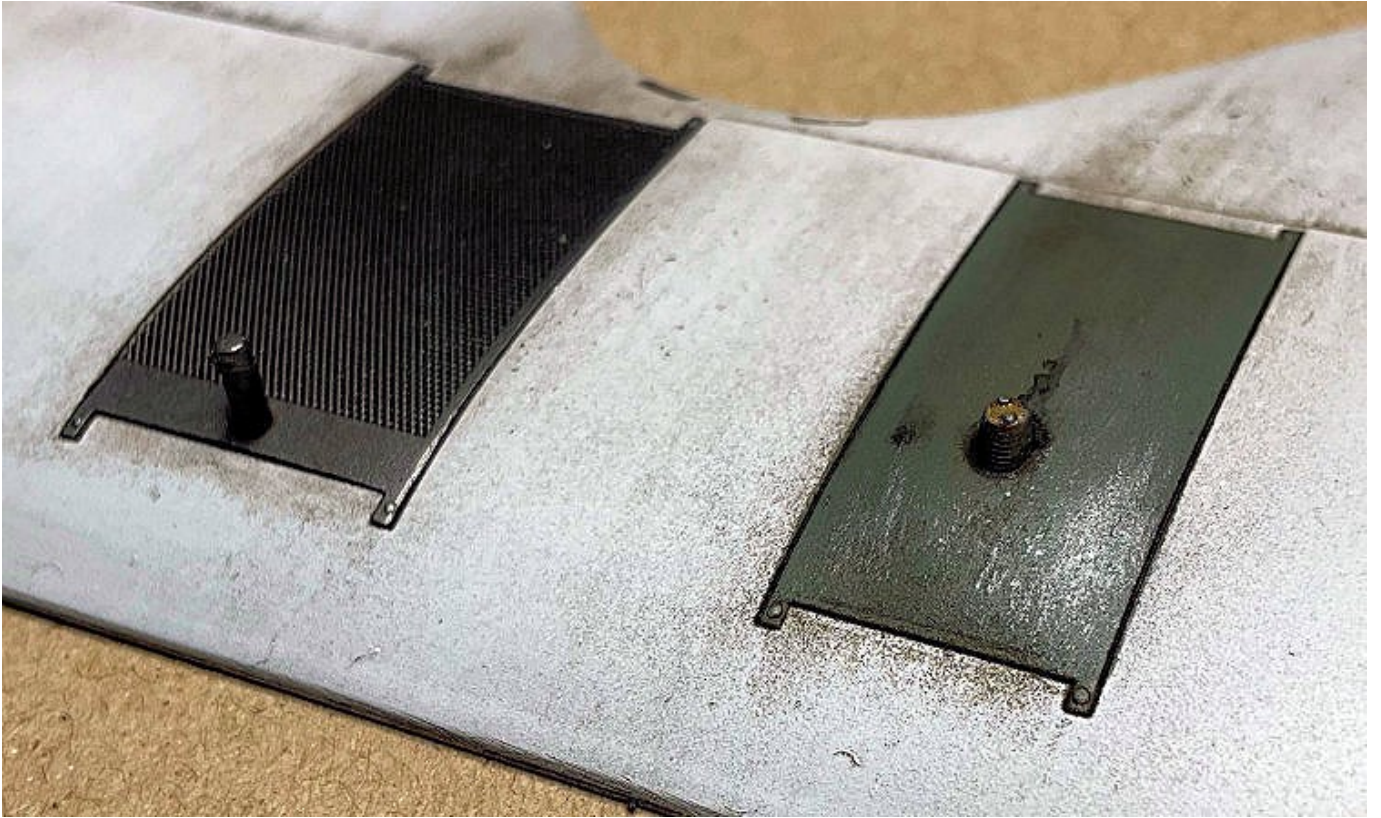
Apply the kit supplied decals ( ) to the propeller blades.

Apply the kit supplied decal ( ) to the generator body.

Airbrush the generator assembly with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.







**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. When 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' 1:48th or 1:32nd scale metal turnbuckles (One Ended),  
'Gaspach' 1:48th scale resin Anchor Points,  
'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:

**NOTE:** Always cut the length of line **much longer** than needed to span between its final attachment points. The line used for control cables is 0.08 mm diameter mono-filament, such as that from 'Steelon' or Stroff GTM'.

### Rudder:

**NOTE:** The rudder control cables are created using blackened 0.4 mm diameter Brass tube, such as 'Albion Alloy's' MBT04 or similar and 'Proper Plane' 1:32nd scale resin turnbuckles.

Use as guides the pre-moulded recesses at the rear of the fuselage rudder cable outlets and drill a hole through the fuselage sides using a 0.5 mm diameter drill.

Using the previous turnbuckle rigging example as a guide, attach a long length of 0.08 mm diameter line through a tube and turnbuckle.

Cut a second length of line and pass it through the pre-drilled hole in one end of the rudder control horn.

Secure the line to the top of the control horn using thin CA adhesive.

Cut away the excess line above the turnbuckle.

Pass the free 'eye' end of the turnbuckle onto the line below the control horn.

Pass the free end of the turnbuckle line into the pre-drilled hole in the fuselage side.

Hold the turnbuckle 'eye' end to the underside of the control horn with the turnbuckle aligned to the fuselage cable hole.

Secure the 'eye' end of the turnbuckle to the underside of the control horn using thin CA adhesive.

Cut away the excess line below the turnbuckle.

Hold the turnbuckle line taut at the fuselage hole and secure in place using thin CA adhesive.

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

Repeat the procedure to add a rudder control line to the opposite side of the fuselage.



### Ailerons:

**NOTE:** Only the rigging location holes are drilled as the cables will be added after the upper wing has been fitted.

Use as guides the pre-moulded recesses at the end of the aileron control levers and drill holes through the levers using a 0.2 mm diameter drill.

Use as guides the pre-moulded recesses at the inboard, underside end of the ailerons and drill holes through the levers using a 0.2 mm diameter drill.

Use as guides the two pre-moulded recesses in the aileron control cable plates on the top surface of the lower wings, drill holes through the lower wings using a 0.3 mm diameter drill.

### Structural wires:

**NOTE:** Always cut the length of line **much longer** than needed to span between its final attachment points. The line used for structural rigging 0.12 mm diameter mono-filament, such as that from 'Steelon' or Stroft GTM'.

**WARNING:** Although resin Anchor Points will remain intact with slight tension applied to the rigging lines, they will break if knocked. **If in doubt**, I suggest using the 'Gaspatch' metal Anchor Points instead.

### Incidence wires:

Point mark the top surface of the lower wings 1.5 mm forward from the locations for the rear interplane struts (a more positive anchor for the wire).

Use as guides the point marks and drill holes into, **but not** through, the lower wings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the top of the forward interplane struts, when fitted.

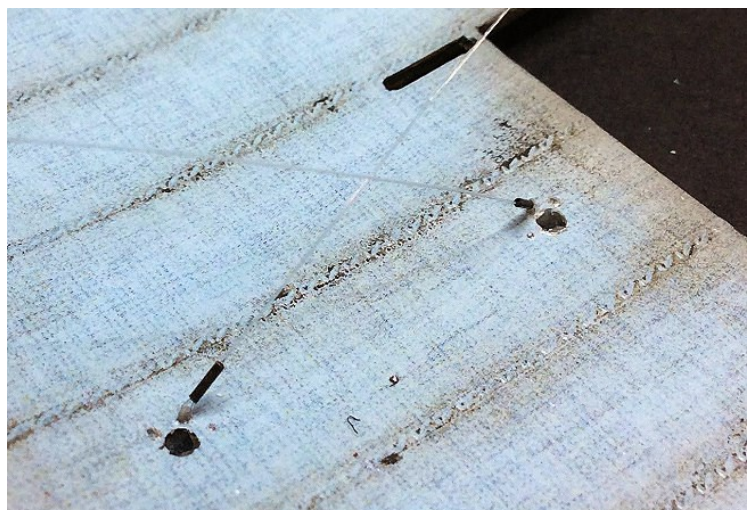
Use as guides the rear pre-moulded recesses at the locations for the forward interplane struts and drill holes into, **but not** through, the lower wings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the top of the rear interplane struts, when fitted.

Use as guides the two inner pre-moulded recesses on the underside of the upper wing, between the locations for the forward and rear interplane struts, Drill holes into, **but not** through, the upper wing using a 0.4 mm diameter drill.

Using the previous turnbuckle rigging example as a guide, attach a long length of 0.12 mm diameter line to four separate 'GasPatch' 1:48th scale resin Anchor Points with a 0.5 mm diameter blackened tubes.

**NOTES:** The line needs to be free to move in the 'eye' end of the Anchor Point, to allow it to self-align when attached to its opposite end fitting. Therefore, during the following step, make sure the line is not secured into the Anchor Point 'eye' end.

Using thin CA adhesive, secure the Anchor Points into the four pre-drilled holes for the incidence wires in the underside of the upper wing.



### Flying wires:

Use as guides the forward pre-moulded recesses at the top of the landing gear front struts and drill holes **through** the strut fittings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the top of the forward interplane struts, when fitted. The holes will also be used for the landing gear bracing wires.

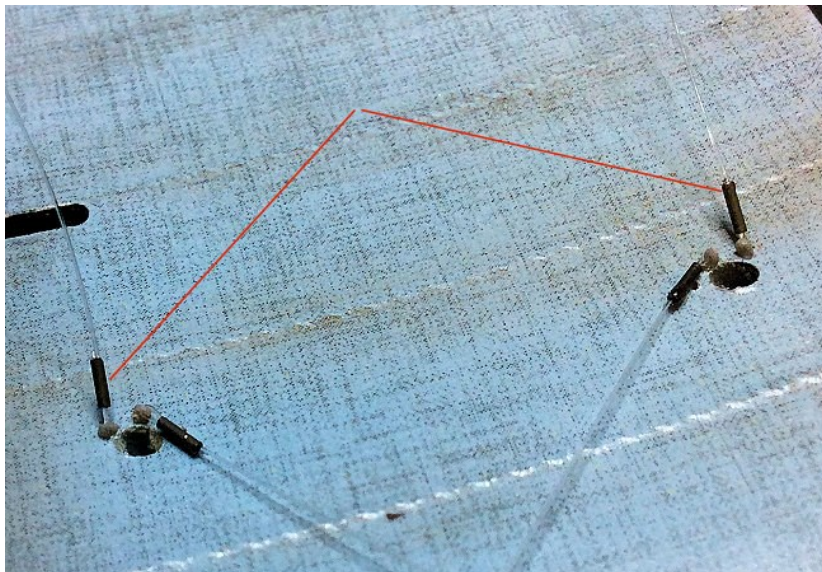
Use as guides the pre-moulded recesses at the fitting just forward from the leading edges of the lower wings and drill holes into the fittings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the top of the rear interplane struts, when fitted.

Use as guides the two outer pre-moulded recesses on the underside of the upper wing, inboard from the locations for the forward and rear interplane struts. Drill holes into, **but not** through, the upper wing using a 0.4 mm diameter drill.

Using the previous turnbuckle rigging example as a guide, attach a long length of 0.12 mm diameter line to four separate 'GasPatch' 1:48th scale resin Anchor Points with a 0.5 mm diameter blackened tubes.

**NOTES:** *The line needs to be free to move in the 'eye' end of the Anchor Point, to allow it to self-align when attached to its opposite end fitting. Therefore, during the following step, make sure the line is not secured into the Anchor Point 'eye' end.*

Using thin CA adhesive, secure the Anchor Points into the four pre-drilled holes for the flying wires in the underside of the upper wing.



### Landing wires:

Use as guides the pre-moulded recesses on the top surface of the lower wings at the location for the rear interplane struts and the middle recess at the location for the forward interplane strut. Drill the holes into, **but not** through, the lower wings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the top of the cabane struts, when fitted.

Use as guides the pre-moulded recesses on the underside of the upper wing centre section, outboard from the cabane strut rear location and the rear recess at the cabane strut front location. Drill the holes into, **but not** through, the upper wing centre section using a 0.4 mm diameter drill.



Using the previous turnbuckle rigging example as a guide, attach a long length of 0.12 mm diameter line to four separate 'GasPatch' 1:48th scale resin Anchor Points with a 0.5 mm diameter blackened tubes.

**NOTES:** *The line needs to be free to move in the 'eye' end of the Anchor Point, to allow it to self-align when attached to its opposite end fitting. Therefore, during the following step, make sure the line is not secured into the Anchor Point 'eye' end.*

Using thin CA adhesive, secure the Anchor Points into the four pre-drilled holes for the flying wires in the underside of the upper wing.

#### Radiator shutter control:

**NOTE:** *The following enhancements are desired, but not required. You may wish not to carry out this enhancement.*

*The radiator shutter was used to partially control the temperature of the engine cooling system by blanking off part of the radiator outlet matrix. The semi-circular shutter was able to rotate on bearings inside its outer support ring, which was attached to the underside of the wing and radiator.*

*Unfortunately, I could not find any description or photographs showing exactly how the position of the shutter was control by the pilot.*

*My assumption is that a control cable was attached to the shutter and was routed, possibly to the fuselage right rear cabane strut and from there, down into the cockpit.*

Drill a hole of 0.4 mm diameter into, **but not through**, the centre section of the upper wing and through the hole already in the radiator shutter.

Using the previous turnbuckle rigging example as a guide, attach a long length of 0.08 mm diameter line to a 'GasPatch' 1:48th scale resin Anchor Points with a 0.4 mm diameter blackened tube.

**NOTES:** *The line needs to be free to move in the 'eye' end of the Anchor Point, to allow it to self-align when attached to its opposite end fitting. Therefore, during the following step, make sure the line is not secured into the Anchor Point 'eye' end.*

Using thin CA adhesive, secure the Anchor Point into the pre-drilled hole in the radiator shutter in the underside of the upper wing.

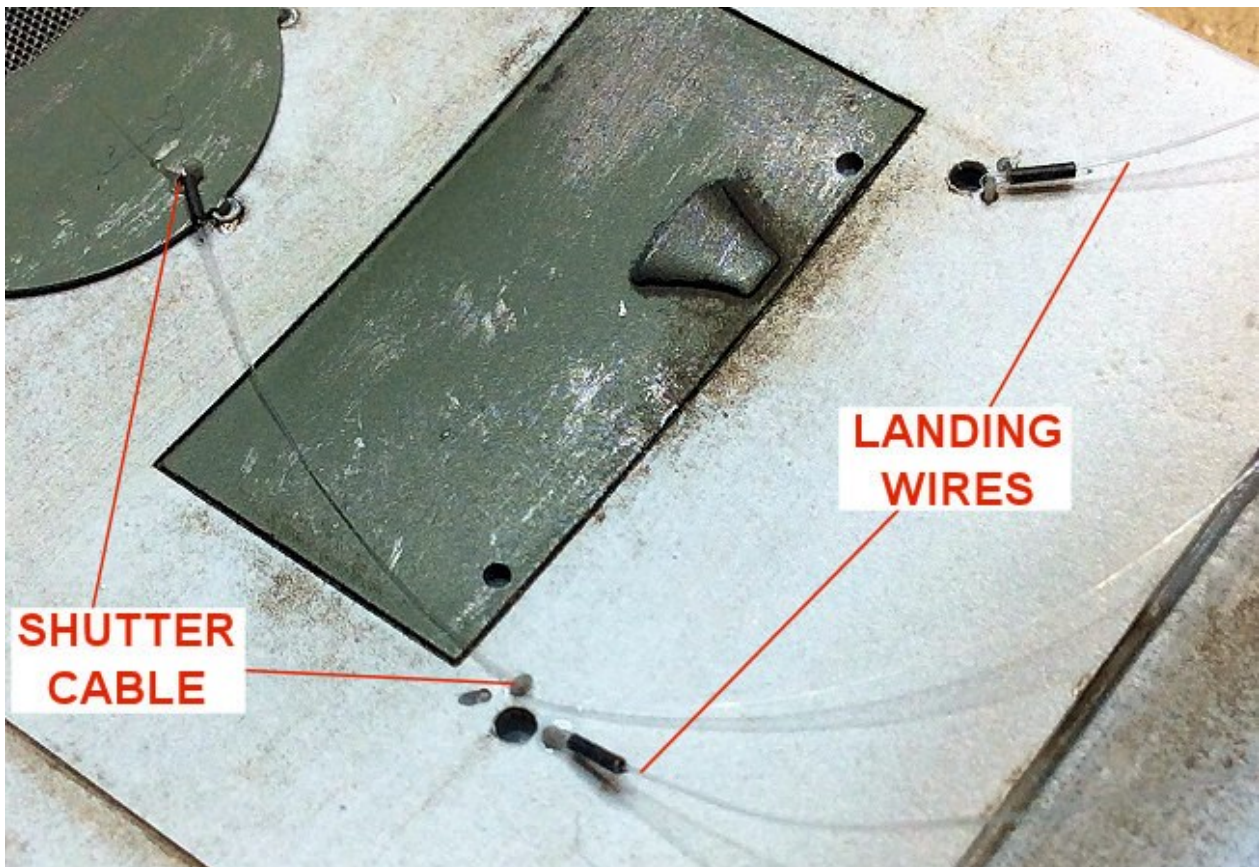
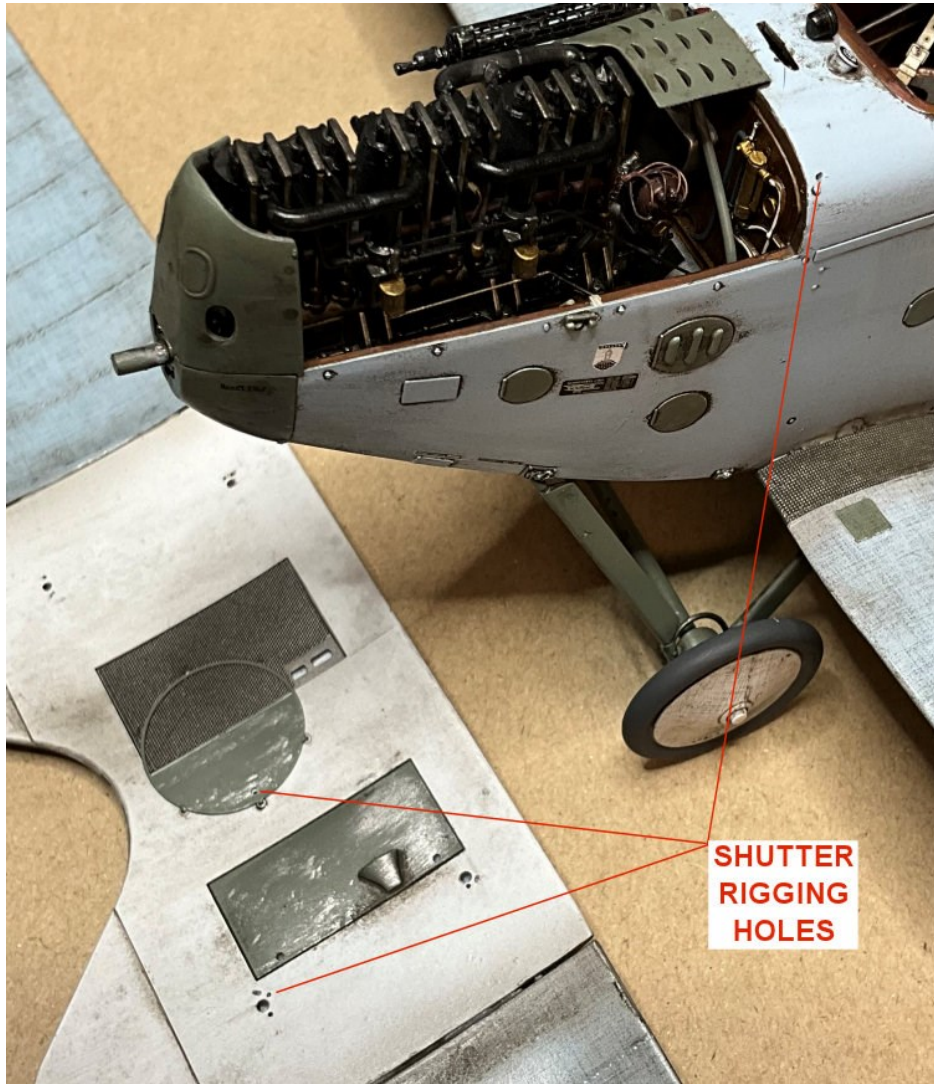
Drill a hole of 0.4 mm diameter into, **but not through**, the centre section of the upper wing, inboard and forward from the rear locating hole for the left fuselage cabane strut.

Using thin CA adhesive, secure a 'GasPatch' 1:48th scale resin Anchor Point into the pre-drilled hole and aligned to the Anchor Point in the radiator shutter.

Pass the free end of the line across and through the Anchor Point at the cabane strut locating hole.

**NOTE:** *Refer to the following photograph for the approximate location of the hole in the fuselage.*

Drill a hole of 0.4 mm diameter through the forward, left side of the cockpit decking panel. This will be used to route the control cable for the radiator shutter into the pilots cockpit.





### Cabane bracing wires:

Drill a hole through the top of the fuselage, either side of the pre-mould 'strap' between the front of the observers cockpit and the rear of the pilots cockpit, using a 0.4 mm diameter drill

Use as guides the pre-moulded recesses on the underside of the upper wing centre section, inboard from the cabane strut rear location and drill the holes into, **but not** through, the upper wing centre section using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the pre-drilled holes in the fuselage between the cockpits.

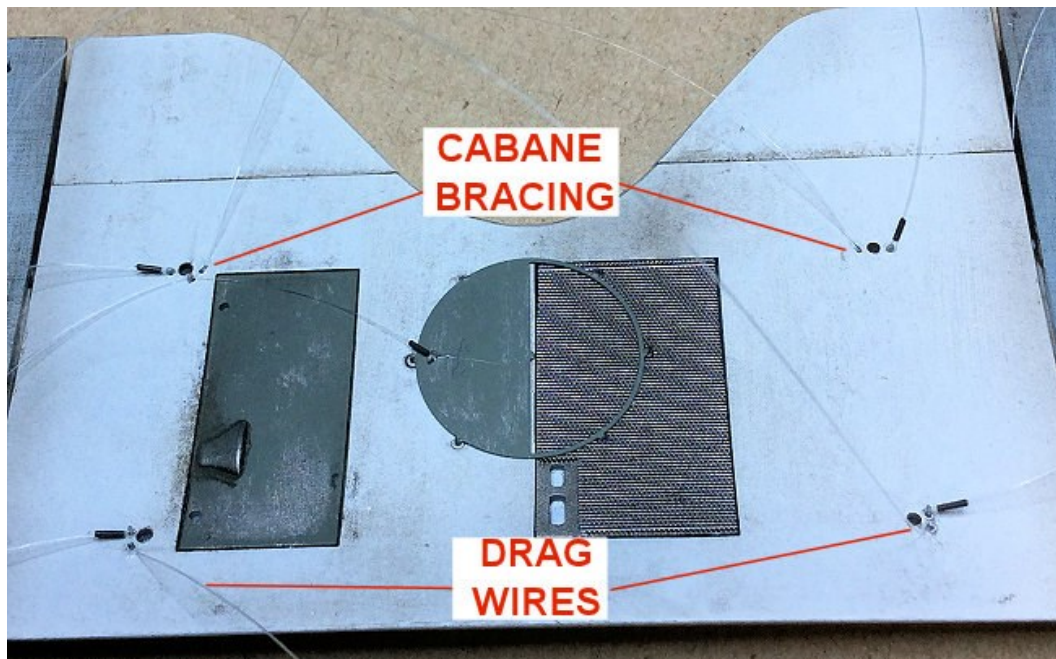
Cut two lengths of 0.12 mm diameter line and secure them into the pre-drilled holes in the upper wing centre section, using thin CA adhesive.

### Upper wing drag wires:

Use as guides the rear pre-moulded recesses at the top of the landing gear front struts and drill holes into the strut fittings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the pre-drilled holes forward from the locations for the front fuselage cabane struts in the wing centre section.

Use as guides the pre-moulded recesses on the underside of the upper wing centre section forward from the locations for the front fuselage cabane struts and drill the holes into, **but not** through, the centre section using a 0.4 mm diameter drill.

Cut two lengths of 0.12 mm diameter line and secure them into the pre-drilled holes in the upper wing centre section, using thin CA adhesive.



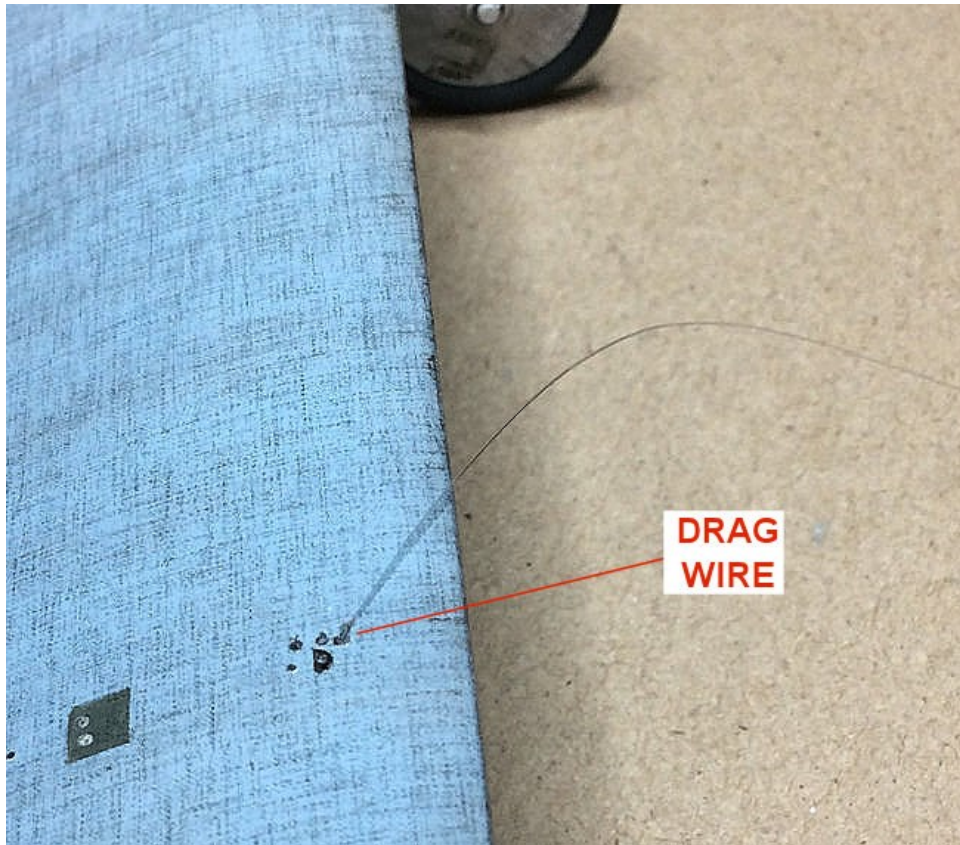
### Lower wing drag wires:

Use as guides the front pre-moulded recesses on the top surface of the lower wings at the location for the forward interplane struts and drill the holes into, **but not** through, the lower wings using a 0.4 mm diameter drill. The holes should be drilled at the approximate angle required to align with the fuselage nose cowl.

Use as guides the pre-moulded recesses on the sides of the fuselage nose cowl and drill the holes into the nose cowl using a 0.4 mm diameter drill.

Cut two lengths of 0.12 mm diameter line and secure them into the pre-drilled holes in the upper wing centre section, using thin CA adhesive.





#### Landing gear bracing:

Use as guides the pre-moulded recesses on inside top of the landing gear forward struts and drill the holes into the struts using a 0.3 mm diameter drill.

Using the previous turnbuckle rigging example as a guide, attach a long length of 0.12 mm diameter line to Anchor Points with a 0.5 mm diameter blackened tubes.

Use as guides the pre-moulded recesses on the ends of the landing gear bracing bar drill the holes through the bracing bar using a 0.3 mm diameter drill.

# PART 13

# PHASE 2

## PART 13 - PHASE 2

### 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.*

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

### Preparation:

### NOTE:

*Refer to the kit instruction manual for the parts required.*

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

Remove the required styrene and photo-etch parts from their sprue gates and prepare the parts for painting and assembly.

### Assembly:

Check all pre-drilled rigging location holes in the fuselage and lower wings. Make sure that:

The holes are free from any decal or paint

The required turnbuckles fully locate into the holes

The pre-drilled holes are at the approximate angles to align with their opposite end fittings when the rigging wires are attached.

Test fit the fuselage cabane struts and interplane struts into their locating holes/recesses in the underside of the upper wing, top surface of the lower wings and the fuselage. Make sure they fully locate.

***NOTE:*** *During the following step, do not pull too hard when checking the lines as the resin Anchor Points may break away with the line.*

Check that each pre-rigged line on the underside of the upper wing are secure in the wing.

***NOTE:*** *De-tack masking tape by pressing it across the skin on the hands. This removes some of the adhesive and helps to prevent the tape from lifting surface decal when it is removed.*

Use de-tacked masking tape to hold the applied pre-rigged lines away from the fuselage and the interplane strut locating holes/recesses on the underside of the upper wing.

Cement the left and right fuselage cabane struts fully into their locating holes in the sides of the fuselage.

Cement the left and right side wing interplane struts fully into their locating holes in the top surface of the lower wings. The struts lean outboard and forward slightly.

With the model stood on its landing gear, hold the underside of the upper wing close to the tops of the struts and check, with the wing central over the cockpits, that the tops of the struts are closely aligned to their locating holes in the upper wing. If necessary, adjust the position of the struts to align them.

Allow the cemented struts to partially set in their locating holes.

Lay the upper wing onto your work surface and turn the model upside down over the upper wing.

Check the position of the top of the struts to their locating holes in the upper wing.



Support the wing and model with sponge or similar, such that the model can be supported over the wing to allow insertion of the struts.

Carefully locate and insert fully each strut into its locating holes in the underside of the upper wing.

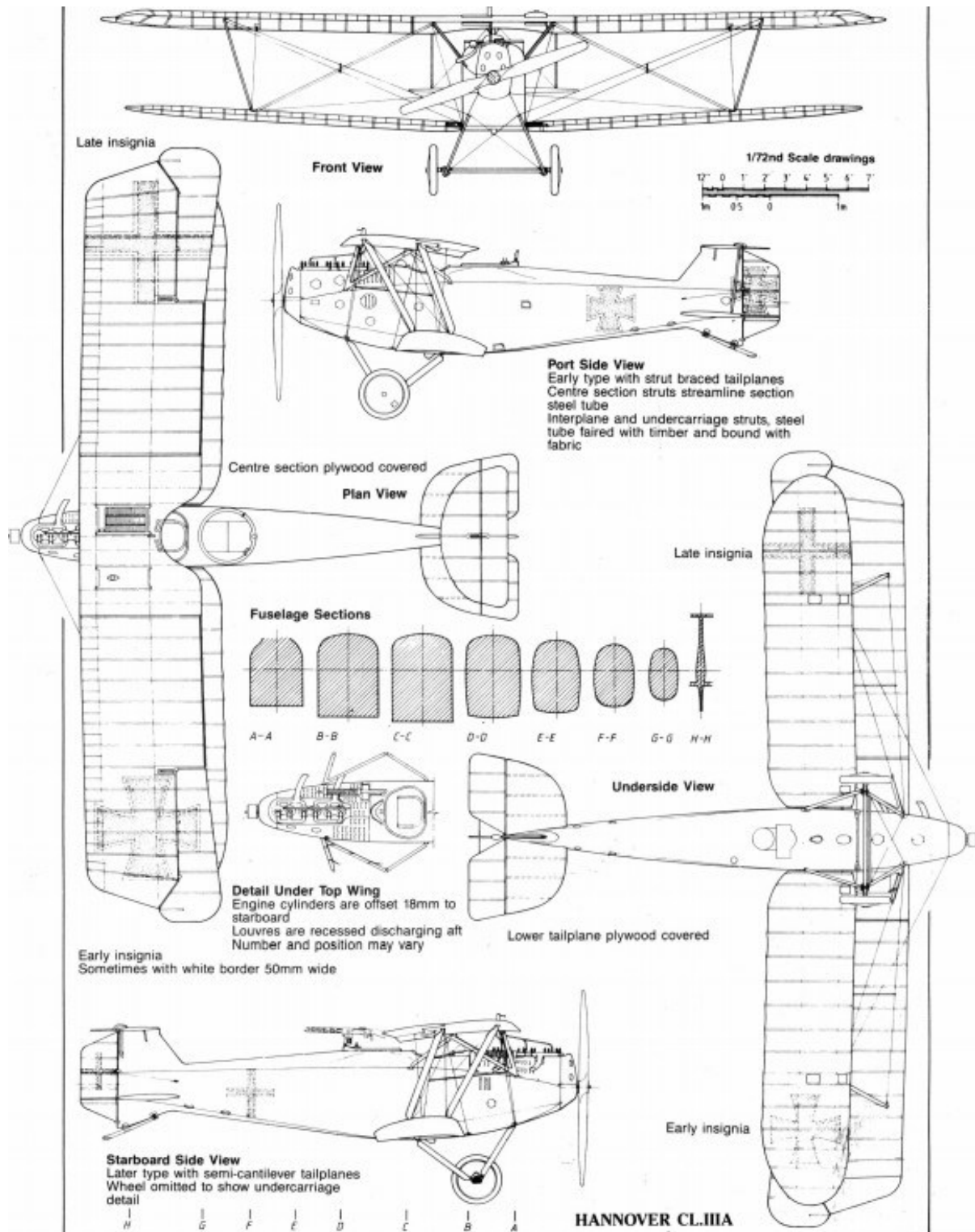
Cement the struts fully into the upper wing.

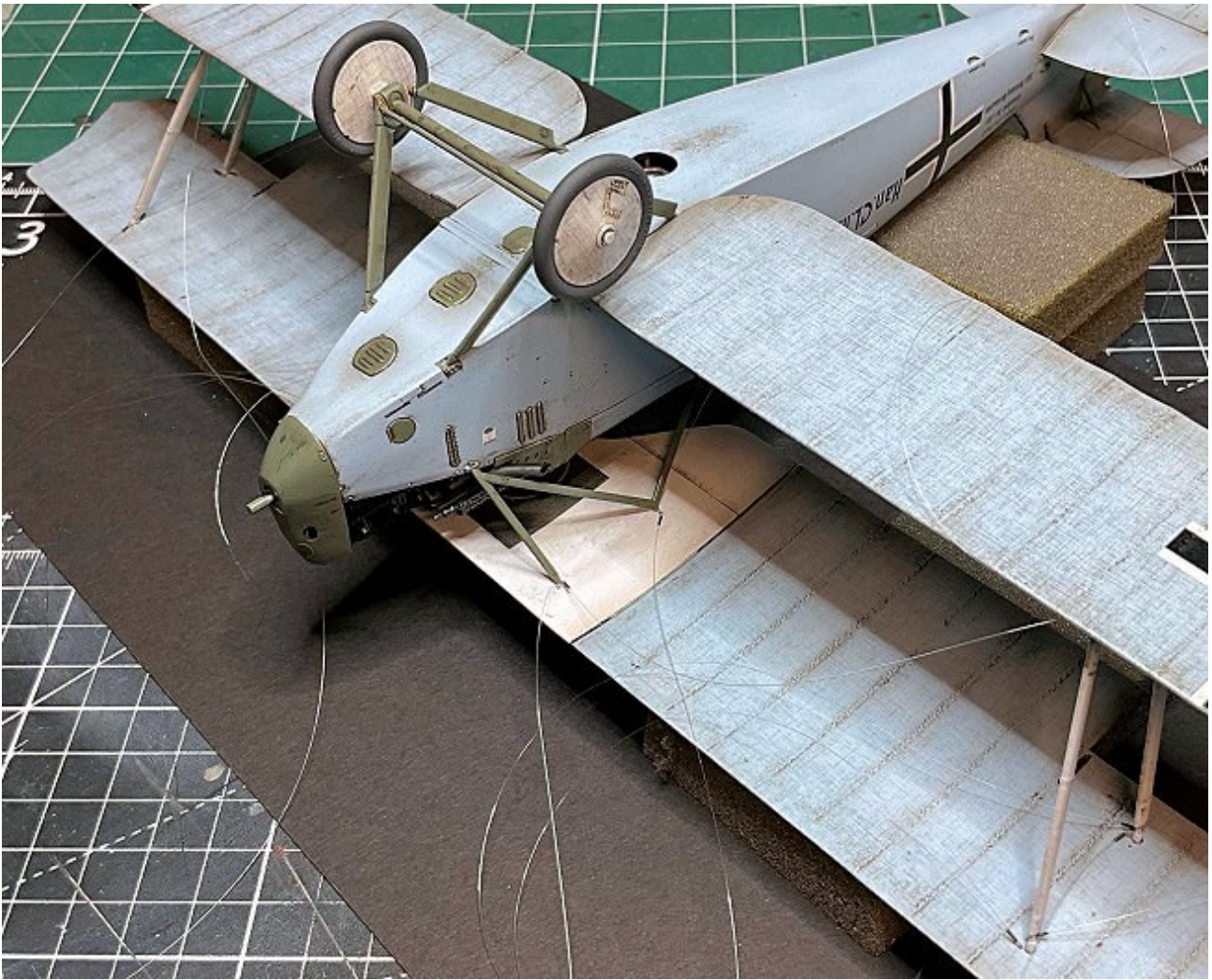
When the cement is partially set, carefully turn the model over and set it down on its landing gear.

Check the alignment of the upper and lower wings when viewed from the sides and from above.

Visually check that all of the struts are fully located into the upper and lower wings and fuselage.

Allow the cemented struts to fully set.





### **Final rigging:**

**NOTE:** *The method of attaching a turnbuckle to the pre-rigged rigging lines is explained in the example at the start of Part 12 (External pre-rigging) of this build log.*

*When final rigging, make sure you attach the rigging lines in an order that will allow access to the remaining lines.*

*Refer to Part 12 (External pre-rigging) and Part 6 (Rigging) of this build log for more information.*

### **Flying wires:**

**NOTE:** *For landing wires, use a 1:32nd scale 'Gaspatch' metal turnbuckle (One End type).*

*Pass a rear flying wire line through a blackened 0.5mm diameter Brass tube, such as that supplied from 'Albion Alloys' (MBT05) or similar.*

*Pass the line through the 'eye' end of a 'Gaspatch' 1:32nd scale turnbuckle (One End type).*

*Pass the line back and through the tube.*

*Using thin CA adhesive, secure the tail of the turnbuckle into its pre-drilled locating hole in the metal fitting on the bottom edge of the fuselage, just forward from the leading edge of the lower wing.*

*Gently pull the free end of the line and keeping the line taut, 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.

Repeat the procedure to attach the opposite rear flying wire.

Repeat the procedure to attach a forward flying wire to its pre-drilled locating hole in the top of the front landing gear strut (forward hole).

Repeat the procedure to attach the opposite forward flying wire.

#### Landing wires:

**NOTE:** For landing wires, use a 1:32nd scale 'Gaspach' metal turnbuckle (One End type).

Repeat the previous procedure to attach a rear landing wire to its pre-drilled locating hole in the underside of the upper wing at the rear fuselage cabane strut.

Repeat the procedure to attach the opposite rear landing wire.

Repeat the previous procedure to attach a forward landing wire to its pre-drilled locating hole in the underside of the upper wing at the front fuselage cabane strut.

Repeat the procedure to attach the opposite forward landing wire.

#### Incidence wires:

**NOTE:** For incidence wires, use a 1:48th scale 'Gaspach' metal turnbuckle (One End type).

Repeat the previous procedure to attach a rear incidence wire to its pre-drilled locating hole in the top surface of the lower wing, at the rear of the forward interplane strut.

Repeat the procedure to attach the opposite rear incidence wire.

Repeat the previous procedure to attach a forward incidence wire to its pre-drilled locating hole in the top surface of the lower wing at the front of the rear interplane strut.

Repeat the procedure to attach the opposite forward incidence wire.

#### Radiator shutter cable:

Trim the length of the pre-rigged shutter wire such that it can be inserted into the pre-drilled hole in the fuselage.

Hold the line in the hole keeping the line taut.

Secure the line in the hole using thin CA adhesive.

#### Cabane strut bracing wires:

Pass the pre-rigged bracing wires into their pre-drilled holes in the top of the fuselage (between the two cockpits).

Hold the taut from inside the observers cockpit to keep the lines taut.

Secure the lines in their holes using thin CA adhesive.

Cut away any residual line from inside the observers cockpit.

#### Drag wires:

**NOTE:** For drag wires, use a 1:48th scale 'Gaspach' metal turnbuckle (One End type).

Repeat the previous procedure to attach a rear drag wire to its pre-drilled locating hole at the top of the landing gear forward strut (rear hole).

Repeat the procedure to attach the opposite rear drag wire.



Repeat the previous procedure to attach a forward drag wire to its pre-drilled locating hole in the side of the fuselage nose cowl.

Repeat the procedure to attach the opposite forward drag wire.

#### Landing gear bracing wires:

**NOTE:** For landing gear bracing wires, use a 1:48th scale 'Gaspach' metal turnbuckle (One End type). The tail of the turnbuckle may need to be 'gently' bent to allow correct alignment of the turnbuckle, when fitted.

Repeat the previous procedure to attach a landing gear bracing wire, diagonally down and its pre-drilled locating hole in the end of the axle bracing bar.

Repeat the procedure to attach the opposite landing gear bracing wire.

#### Assembly:

**NOTE:** During the following step, make sure the upper wing is not flexed or moved too much, as this may cause rigging or struts to break.

Fully locate the two ailerons, onto their locating rods, at the trailing edges of the upper wing.

#### Final rigging (continued):

##### Aileron control cables:

Pass a long length of 0.08 mm diameter mono-filament, such as 'Steelon' or 'Stroft GTM', through the four aileron control cable pre-drilled holes in the lower wings.

Secure the lines in their holes using thin CA adhesive.

Cut away any residual line from the underside of the lower wings.

Pass an inboard control line up and through the pre-drilled hole in the aileron control lever.

Keeping the line taut, secure the line in the control lever using thin CA adhesive.

Cut away any residual line at the top of the control lever.

Repeat the procedure to attach the opposite inboard aileron control line.

Pass an outboard control line up and through the pre-drilled hole in the inboard end of the aileron.

Keeping the line taut, secure the line in the aileron using thin CA adhesive.

Cut away any residual line at the top of the aileron.

Repeat the procedure to attach the opposite outboard aileron control line.

#### Rigging - final tensioning:

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.

**WARNING:** Care needs to be taken when using this method to tension line, as using a heat source is required.

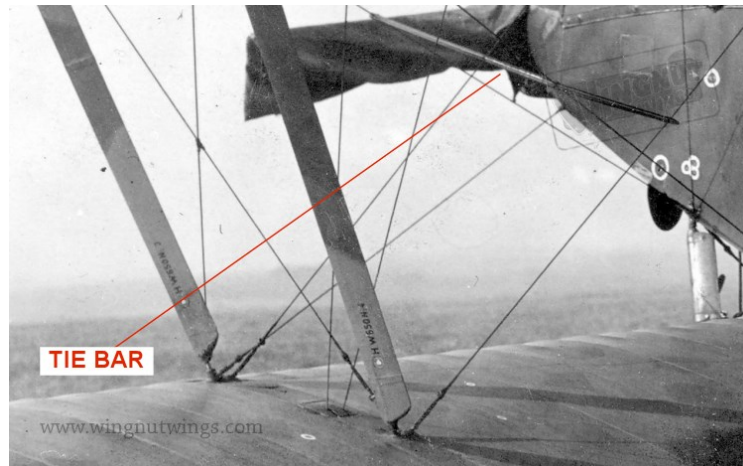
Carefully move a suitable heat source (I use a small electrical soldering iron) close to and along the slack line, keeping the heat source always moving. You will see the line tension as the applied heat takes effect, shrinking the line.





### Flying wire bracing bar:

**NOTE:** A bracing bar was fitted at both sides of the aircraft and between the front and rear flying and landing wires. This tied together the wires to prevent them individually vibrating or flexing.



Cut two lengths of 0.6 mm diameter plastic rod, such as that from 'Plastruct' or similar. The rods should be longer than that needed to span across the two flying and the two landing wires.

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

Airbrush the rods with 'Hataka' Air Superiority Blue (C-155 - Orange line). The paint should be thinned with 'Mr. Colour' Self-levelling thinners (MLT) to a ratio of approximately 50/50.

Gently lay a rod across the two flying and landing wires on one side of the aircraft. Make sure the front of the rod is just forward from the front flying wire and is in contact with the remaining three wires.

Apply a small amount of thin CA adhesive to secure the rod to the front flying wire, making sure the rod remains in position on all four wires.

Apply a small amount of thin CA adhesive to secure the rod to the rear landing wire, then to the remaining flying and landing wires.

Carefully snip the overhanging rod from back of the rear landing wire.

Repeat the procedure to add the bracing bar to the opposite side of the aircraft.



### Rigging finish:

Airbrush the mono-filament and metal turnbuckles used to rig the model with semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.



## **Assembly (continued):**

### **Windscreen:**

**NOTE:** *Although awkward to fit the windscreen at this stage of the build, fitting it any earlier would have meant it being contaminated with semi-matte clear coat when the final rigging was airbrushed.*

Test fit the windscreen into its locating slot, just forward from the pilots cockpit. The windscreen can be located using straight tweezers and from under the trailing edge of the upper wing.

If necessary, carefully scrape or sand away the locating tab on the windscreen to achieve an easy fit into the fuselage slot.

Brush paint the bottom frame (both sides) of the windscreen with 'Mr. Colour' Stainless Steel (213) or similar.

Secure the windscreen in position on the fuselage using a PVA Adhesive, such as 'MicroScale' Kristal Klear) or similar.

### **Radiator pipes:**

**NOTE:** *The left side radiator pipe E8 locates into a hole on the outer face of the left engine bearer A12 with its top locating into the rear slot in the radiator on the underside of the upper wing. However, I found it easier to cut away the bearer locating peg from the pipe and the bottom section of the pipe (which is not visible when fitted). Doing this allows the pipe to be more easily fitted and secured using only the radiator connection.*

Position the left side radiator pipe E8 into the engine bay with its top locator into the rear slot in the radiator on the underside of the upper wing.

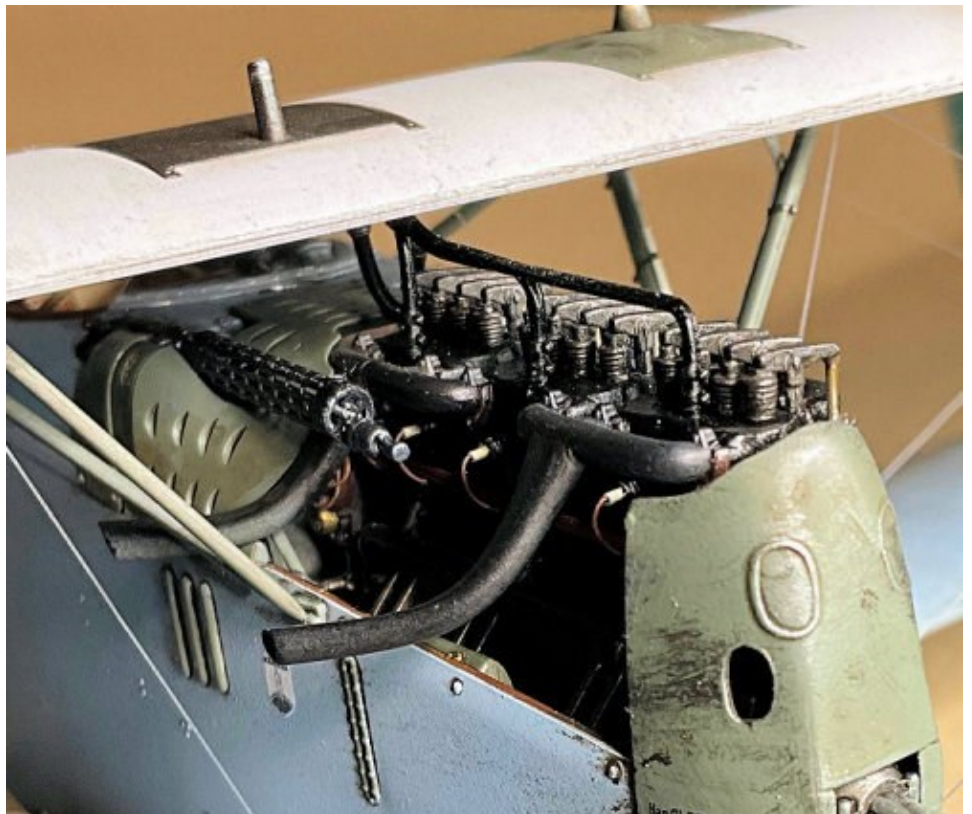
Cement the pipe in the radiator slot.

Position the top radiator pipe E20 into its locating recesses on the top, right of the engine, with its top locator into the forward slot in the radiator on the underside of the upper wing.

Cement the pipe in the radiator slot and the engine.

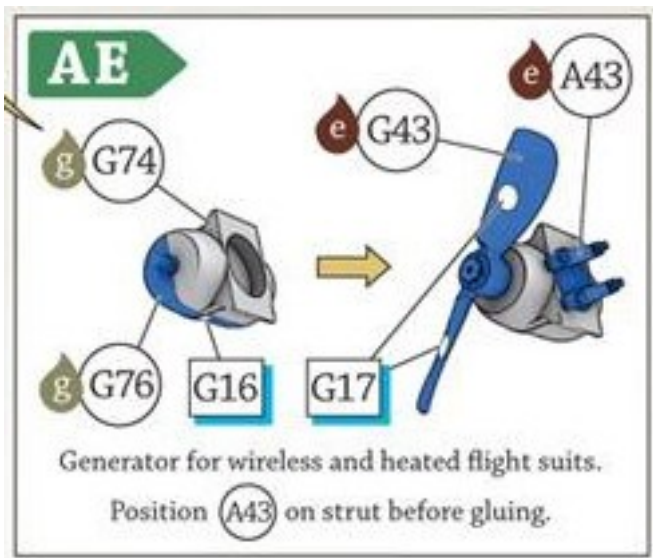
### **Engine exhaust:**

Cement the forward exhaust pipe E16 into its recesses in the top, right side of the engine.



## Generator:

**NOTE:** The mounting bracket for the generator was secured to the strut with two staples, which are not represented in the kit.



Hold the generator in position on the inside face of the landing gear forward, left strut and note the two protruding corners of the generator base plate (as seen from the wheel side of the strut).

Drill a hole of 0.3 mm diameter through the two diagonally opposite corners of the base plate.

Cut two lengths of 0.3 mm diameter lead wire, such as that from 'Plus Model' or similar.

Use thin CA adhesive to secure the lead wires into the pre-drilled holes and from the underside of the base plate. Make sure the wires only just protrude from the generator side of the holes.

Cement the generator to the inside face of the landing gear forward, left strut. It should be positioned such that the propeller would be vertical with the aircraft in flight. It should also be aligned to the fuselage when viewed from above or below.

Carefully wrap the two lead wires across the outer face of the landing gear strut, keeping the wires parallel to each other.

Secure the wires to the strut using thin CA adhesive.

Trim the free ends of the wires such that they can be wrapped over the strut to their opposite corners of the generator base plate.

Secure the wires to those corners of the generator base plate, using thin CA adhesive.

Cement the propeller onto its locating peg on the front of the generator body.

To represent the power cable from the generator:

Drill a hole of 0.5 mm diameter into the underside of the fuselage, just inboard from the landing gear forward left strut.

Cut a length of 'MFH' black 0.4 mm diameter tube (P961).

Secure one end of the tube into the pre-drilled hole using thin CA adhesive.

Route the tube over the top of the strut and secure the tube down the outer face of the strut towards the rear of the generator, using thin CA adhesive.

Secure the free end of the tube onto the top of the generator using thin CA adhesive.

Cut away any residual tube at the generator.



**NOTE:** *The particular aircraft being modelled was operated as a training aircraft at the flight school FEA 8 (Fliegerersatz Abteilung 8). The aircraft would have been equipped for specific training flights and therefore would have been equipped appropriately, with such as a wireless set, machine guns and external bombs or grenades. I chose to model this aircraft fitted with a pilots 'Spandau' machine, observers 'Parabellum' machine gun and empty flare and grenade racks.*

**Grenade container:**

**NOTE:** *The empty grenade container was created from one from my 'spares' box with a 0.2 mm thick plastic card bottom added.*

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

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

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

Airbrush the grenade container with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

Secure the grenade container to the fuselage left side below the observers cockpit, using thin CA adhesive.





### Flare rack:

Cut away the pre-moulded cartridges from the flare rack D11.

At the locations of the flares, drill holes of 0.8 mm diameter into the flare rack.

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

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

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

Airbrush the flare rack with a light semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

using thin CA adhesive.

Use thin CA adhesive to secure the flare rack to the fuselage right side below the observers cockpit.



### Observer's gun mounting:

Before fitting the gun mounting ring, first decide how the mounted 'Parabellum' will be positioned in the aircraft.

**NOTE:** *The top of the gun mount G4 locates either side of the bottom, front of the breech block of the machine gun. Some removal of resin from the breech block area may be required in order to fully locate the tops of the gun mount.*

Clip the gun mount G4 onto its base G9 on the observers swivel ring mounting. Make sure it is positioned such that the machine can be fitted onto it with its butt resting in the rest A28.

Cement the gun mount into its base.

Using thin CA adhesive, secure the 'Parabellum' machine gun onto the gun mount and rest.

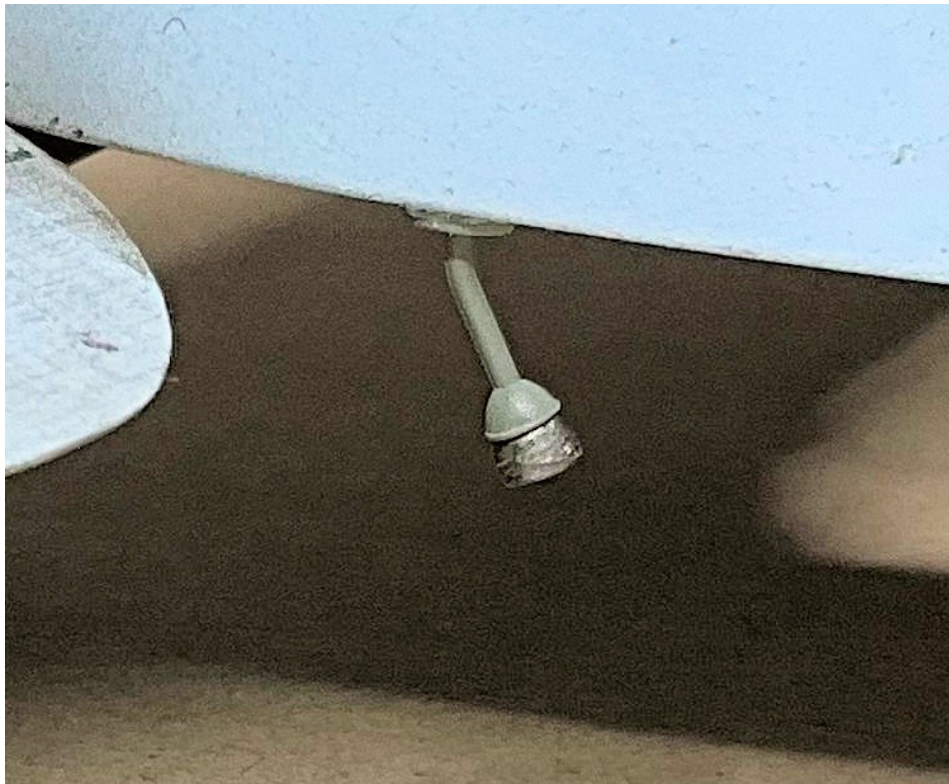
Cement the gun mounting ring into the opening in the observers cockpit.



Wireless aerial:

Drill a hole of 1.0 mm diameter into the left underside of the fuselage, just inboard and to the rear of the camera opening.

Cement the wireless aerial into its locating hole in the underside of the fuselage.



Propeller:

**NOTE:** *When fitting the propeller on the aircraft, take into consideration the position of the external rigging and the ladder (if located at the aircraft).*

Using CA adhesive, secure the propeller onto the engine propeller shaft and in the desired position.



# PART 14

# FIGURES

## **PART 14 - FIGURES AND LADDER**

**NOTE:** *The figure I chose to use for this model is the 'Kellerkind Miniaturen' German mechanic and dog (54105). Refer to Part 5 (Resin) for more information when working with resin parts.*

*The mechanic figure is supplied as four parts, which are a body, right and left arms and a boot. The dog is supplied as two parts, which are the body and tail.*

### **Mechanic:**

#### **Preparation:**

Cut the figure, two arms and the boot from their casting blocks.

Sand away any residual moulding block resin from the parts.

Check the parts for any resin flash or seams. If found, remove by either sanding or scraping.

Check the parts for any surface irregularities, such as holes or mis-moulded parts. If found, use modelling putty to restore the finish.

Drill out the opening in the boot then carefully scrape out the inner sides to reduce the boot sides to a more realistic thickness.

**NOTE:** *The following two steps should be carried out together.*

Remove material from the boot locating indent for the right hand, to allow it to better fit onto the hand.

Carefully slice out between the clenched fingers and the thumb of the right hand, to better fit the boot.

#### **Assembly:**

Drill a hole of 0.8mm diameter up into the centre of the left 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.

Secure the two arms into the body using thin CA adhesive.

Secure the boot into the right arm using thin CA adhesive.

#### **Painting:**

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

Brush paint the figure as follows:

**'AK Interactive' Black Uniform Base (AK3220)** - Jacket and Trousers.

**'Tamiya' Rubber Black (XF65)** - blend shadows in jacket and trousers.

**'AK Interactive' German Uniform Light (AK3092)** - Uniform jacket and cap.

**'AK Interactive' Black Uniform Base (AK3220)** - blend with uniform jacket and cap.

**'AK Interactive' Brown leather (AK3031)** - Boots.

**'Tamiya' Semi-matt clear (X35)** - gloss over boots

**'Tamiya' Rubber Black (XF65)** - Cap band.

**'Tamiya' Buff (XF57)** - Sock on left foot and shirt collar.

**'Tamiya' Red (XF7)** - Piping around cap band and sown uniform jacket.

**'Mr. Colour' Stainless Steel (213)** - Buttons on jackets, collar and cap studs.

**'AK Interactive' British Light Uniform (AK3081)** - Hair.

**'AK Interactive' Light Flesh (AK3012)** - Lips.

### Flesh:

**NOTE:** *The following paints for flesh are water based and can be thinned as required using water, which is also used to clean the brushes. It's easier to use a 'wet palette' when applying these paints as this keeps the paint from drying and allows mixing of paints as required. A basic wet palette can be a water proof plastic lid with dampened kitchen roll paper laid inside. The paints are then dripped onto the damp paper and applied from there.*

The paints used for the flesh of the figures are from the 'Citadel' colour range:

Base coat - 'Bugmans Glow'.

Shading - 'Reikland Flesh Shade'.

Flesh tone - 'Cadian Flesh Tone'.

Flesh highlights - 'Kislev Flesh'.

Brush 'Bugmans Glow' over the exposed head and hands of the figure and allow to dry.

Brush thinned 'Reikland Flesh Shade' over the painted head and hands of the figure and allow to dry.

Brush thinned 'Cadian Flesh Tone' over the painted head and hands of the figure and allow to dry. Do not apply the paint such that it completely covers the previous coat, as subtle shadows are necessary around such as the ears, eyes, nose and chin etc.

Brush thinned 'Kislev Flesh' over the painted head and hands of the figure and allow to dry. This application is very light and intended to highlight areas such as the eye brows, ears, bridge of the nose and jaw line etc.

Using a sharp point, apply 'Tamiya' Rubber Black (XF85) or similar to create the eye pupils.

### Weathering:

Sponge lightly on the figure to represent dirt and oil stains:

**'Tamiya' Weather Master Set D (Oil Stain)**

oil stain on trousers, pockets, jacket elbows as desired.

**'Tamiya' Weather Master Set A (Mud)**

dirt on boots as desired.

### Assembly (continued):

Test fit the clenched right hand into its recess in the single boot.

Make sure the boot fully locates onto the hand.

If necessary, carefully remove any paint to allow the boot to fully locate.

Secure the boot onto the hand using CA adhesive.





## Dog:

### Preparation:

Cut the dog and tail from their casting blocks.

Sand away any residual moulding block resin from the parts.

Check the parts for any resin flash or seams. If found, remove by either sanding or scraping.

Check the parts for any surface irregularities, such as holes or mis-moulded parts. If found, use modelling putty to restore the finish.

### Assembly:

Drill into the tail location on the dogs rear, using a 1.0 mm diameter drill.

Secure the tail to the dogs body, at the desired angle, using thin CA adhesive.

### Painting:

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

Brush paint the dog with a mixture of the followings:

**'AK Interactive' British Uniform Light (AK3082)**

**'AK Interactive' Black Uniform Base (AK3220)**

**'Tamiya' White (XF2)**

**'Tamiya' Black (X1)** - collar, eyes and nose.

**'Tamiya' Semi-matt clear (X35)** - gloss over boots



## Ladder:

**NOTE:** I used a ladder, cut to the correct length, from my 'spares' box.

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

Airbrush the ladder with 'Tamiya' Buff (XF57) or similar.

Refer to Part 2 (Wood effects) of this build log for information. I used 'Windsor & Newton' Griffin Alkyd paints (Burnt Umber).

The ladder was seal by airbrushing with a semi-gloss clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

To represent wear, I sponged 'Tamiya' Weathering Master Set E (grey) and Set A (Mud) onto the ladder sides and rungs.

# 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 'Polak' Wild Meadow - variation E (4705). The clear backing sheet was removed from the grass mat. The cut mat was then positioned on the base and the model, figure and accessories were positioned 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. The grass mat was then laid onto the PVA adhesive and positioned correctly. Pressure was applied using books or similar laid onto the mat, to ensure the mat was in full contact with the adhesive. The self-adhesive backed information plaque was positioned onto an acrylic plaque stand and pressed to make full contact. The plaque stand was then 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 area 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 two part epoxy adhesive was then applied to one scuffed area and the stand was carefully placed in position onto the display base and pressed down to make full contact.

The model and figure were then positioned on the base in their final positions and the support pin for the 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.*

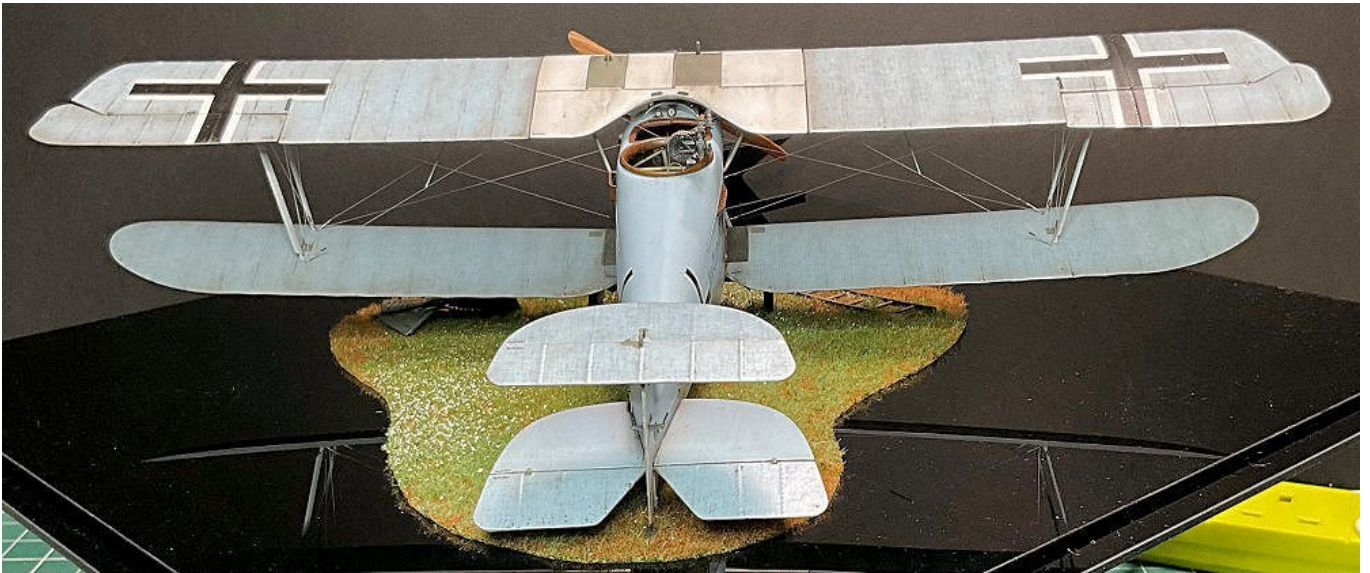
Thin CA adhesive or PVA adhesive was then applied to the support pin of the pilot figure, which was then located, in the desired position, into the pre-drilled location hole. The aircraft itself, being light in weight, will tend to sit on top of the grass on the mat, rather than seat fully down, as would 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**