World War One Aircraft Models

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

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

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, covering my build of the 'HPH Models' 1:32 scale resin model of the Italian Macchi M.5 float plane fighter.

Mike 'Sandbagger' Norris

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INTRODUCTION

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

Sorted

AFTER MARKET

AFTER MARKET

Model Kit

'HPH Models' Macchi M.5 (HPH 32035R)

Figure

'Allarmi' WW1 Aces of Italian A.F. (32063).

Decals

'Aviattic' CDL Bleached (ATT32044),
'Airscale' Generic WW1 instruments (AS32).

Propeller

'Proper Plane' wood laminated 'Lang' type.

Additional parts

'Shapeways' 3D printed 1:32 German magneto set (x2),
'Taurus Model' 1:32 Magneto starter and switch (D3230b),
'RB Motion' Aluminium Nuts Hex 0.79mm (1281-A) or 0.51 mm (1279-A),
'PART' photo-etch for Fokker Dr.1 (S32-023).

Rigging accessories

'Gaspatch' Elite 1:48th scale turnbuckles,
'Albion Alloy' Micro-tube (Brass or Nickel Silver), 'EZ' Fine Black line,
'Part' WWI control horns and turnbuckles set (S48087),
'EZ' black fine line, 'INIFI Model' 0.135 mm black rigging,
'Stroft GTM' Silicon-PTFE tempered monofil (0.08mm diameter),
'Steelon' Mono-Filament 0.12mm diameter.

Pipes, cables and wires

'PlusModel' lead wires, 'ANYZ' Black/Silver braided line 0.5 mm diameter (AN011).

Sundries (as required)

'Araldite' two part epoxy adhesive, Paints ('Tamiya' Acrylic, Humbrol Acrylic,
'Mr. Metal Colour', 'AK Interactive' Primer and micro-filler (Grey AK758, White AK759),
'AK Interactive' Filters (Wood AK-261, Kerosene AK-2039, Oil AK-2019 and Wash AK-2033),
'Alclad' Lacquers, 'Alclad' Aqua Gloss 600, 'Mr. Colour' Levelling Thinners,
'Vallejo' Model Colour, PVA Adhesive (e.g. 'Micro' Krystal Clear), 'VMS Fleky' Resin CA adhesive (Standard and Thin), Blue or White Tack, 'Vallejo' Plastic Putty (401),
'De-Lux Materials' Perfect Plastic Putty, Sanding and/or Polishing sticks from 'Flory Models',
'Humbrol' Maskol, 'Humbrol' pigments, 'UHU' White Tack, 'Milliput' two part putty,
'White Spirits', 'MicroScale' MicroSol/MicroSet, 'MicroScale' Krystal Clear,
'Mr. Surfacer' 500, 1000, 1200, 'DecoArt Crafters Acrylic' (water based) oil paints,
'Artool' Ultra Mask sheets, 'Vallejo' Still Water (26.230),
'Mr. Hobby' Fine Masking Sheet (GT53:480),
'Model Factory Hire' (MFH) 0.4 mm black tube (P961).

Weathering mediums

'Flory' Clay washes, Flory Pigments, AK Interactive engine washes,
'Tamiya' Weathering Master (Set C, D and E), 'Derwent' Inktense 24 ink pencils.

Display Base

Commercially made Acrylic base/cover and etched plaque (name plate),
'Coastal Kits' 1:32 Scale 'Abandoned Airfield' display mat.

AIRCRAFT BACKGROUND

AIRCRAFT BACKGROUND

References:

Various on-line data (e.g. 'Idflieg.com', Wikipedia).
'Windsock' Data File No.86 - Macchi M.5 by Gregory Alegi.
'Windsock' Data File No.162 - Macchi M.7 by Gregory Alegi.

Background:

This model depicts the Macchi M.5, Serial No.7288 as flown by Tenente di Vascello Alberto Bartolozzo, Officer Commanding No.260a Squadriglia, operating from Saint Andrea Seaplane Station near Venice during 1918. This unit was Italy's first Naval fighter squadron and was operational from November 1917 until November 1918, operating over the Northern Adriatic Sea. On both sides of the fuselage of this aircraft was the Latin 'FRANGAR NON FLECTAR', which loosely translated means 'I'll break but not bend'. The Macchi M.5 was an Italian single seat fighter flying boat designed and built by Nieuport-Macchi at Varese. It was extremely manoeuvrable and agile and matched the land-based aircraft it had to fight. The first prototype of a single-seat sesquiplane fighter was the Type M, which first flew in 1917. Developed by engineers Buzio and Calzavera it had a single-step hull and an open cockpit forward of the wings and was similar to the earlier Macchi M.3. It was followed by another prototype with a revised tail unit designated the Ma and further developed as the M bis and Ma bis. The production aircraft was designated the M.5 and like the prototypes was powered by a single Isotta Fraschini V.4B engine in pusher configuration. Deliveries soon commenced in the Summer of 1917 to the Aviazione per la Regia Mara (Italian Navy Aviation). Late production aircraft had a more powerful Isotta Fraschini V.6 engine and redesigned wingtip floats, they were designated M.5 mod. Macchi produced 200 aircraft and another 44 were built by Società Aeronautica Italiana. The M.5 was operated by five Italian maritime patrol squadrons as a fighter and convoy escort, and some were embarked on the Giuseppe Miraglia. Towards the end of World War I, the aircraft were flown by both United States Navy and United States Marine Corps. Ensign Charles Hammann won the first Medal of Honor awarded to a United States naval aviator in an M.5. In 1923, when the Regia Aeronautica was formed, 65 Macchi M.5 aircraft were still in service, although they would all be scrapped within a few years.

General characteristics:

- Crew: one
- Length: 8.08 m (26 ft 6 in)
- Wingspan: 11.90 m (39 ft 0½ in)
- Height: 2.85 m (9 ft 4½ in)
- Wing area: 28 m^2 (301.4 ft^2)
- Empty weight: 720 kg (1,587 lb)
- Gross weight: 990 kg (2,183 lb)

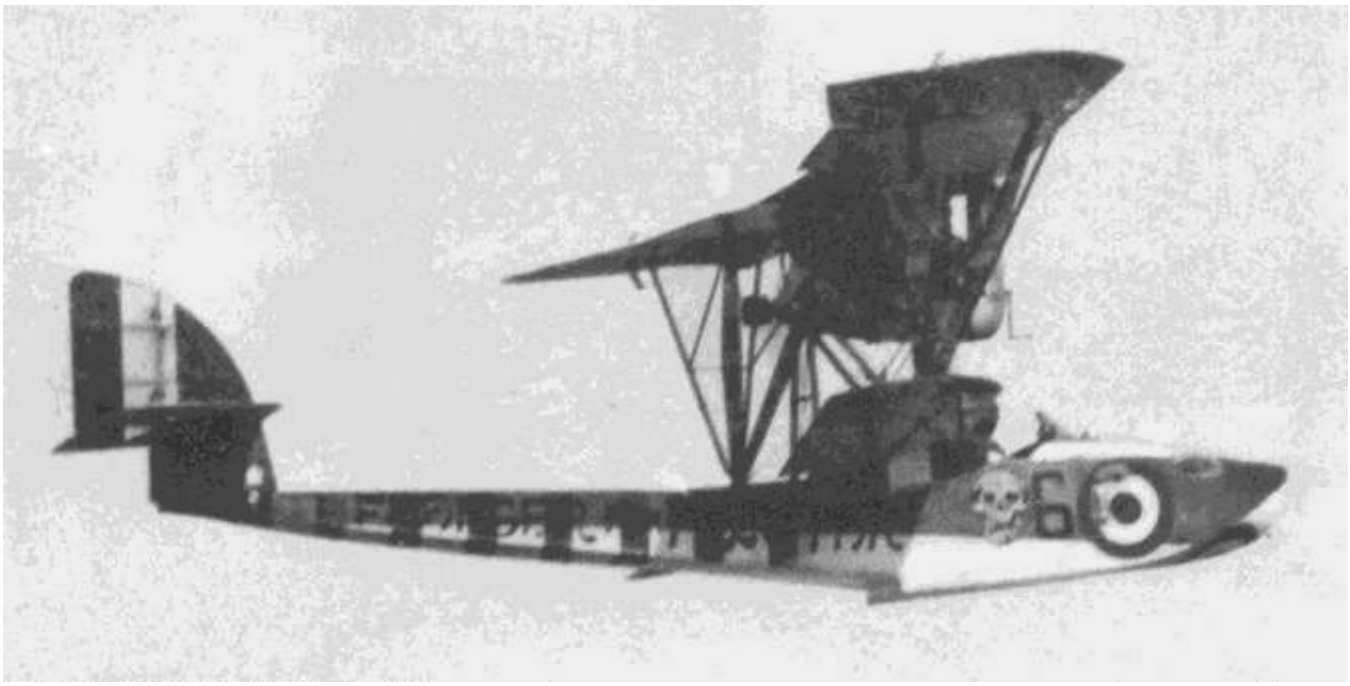
Powerplant: 1 × Isotta Fraschini V.4B inline piston engine, 119 kW (160 hp)

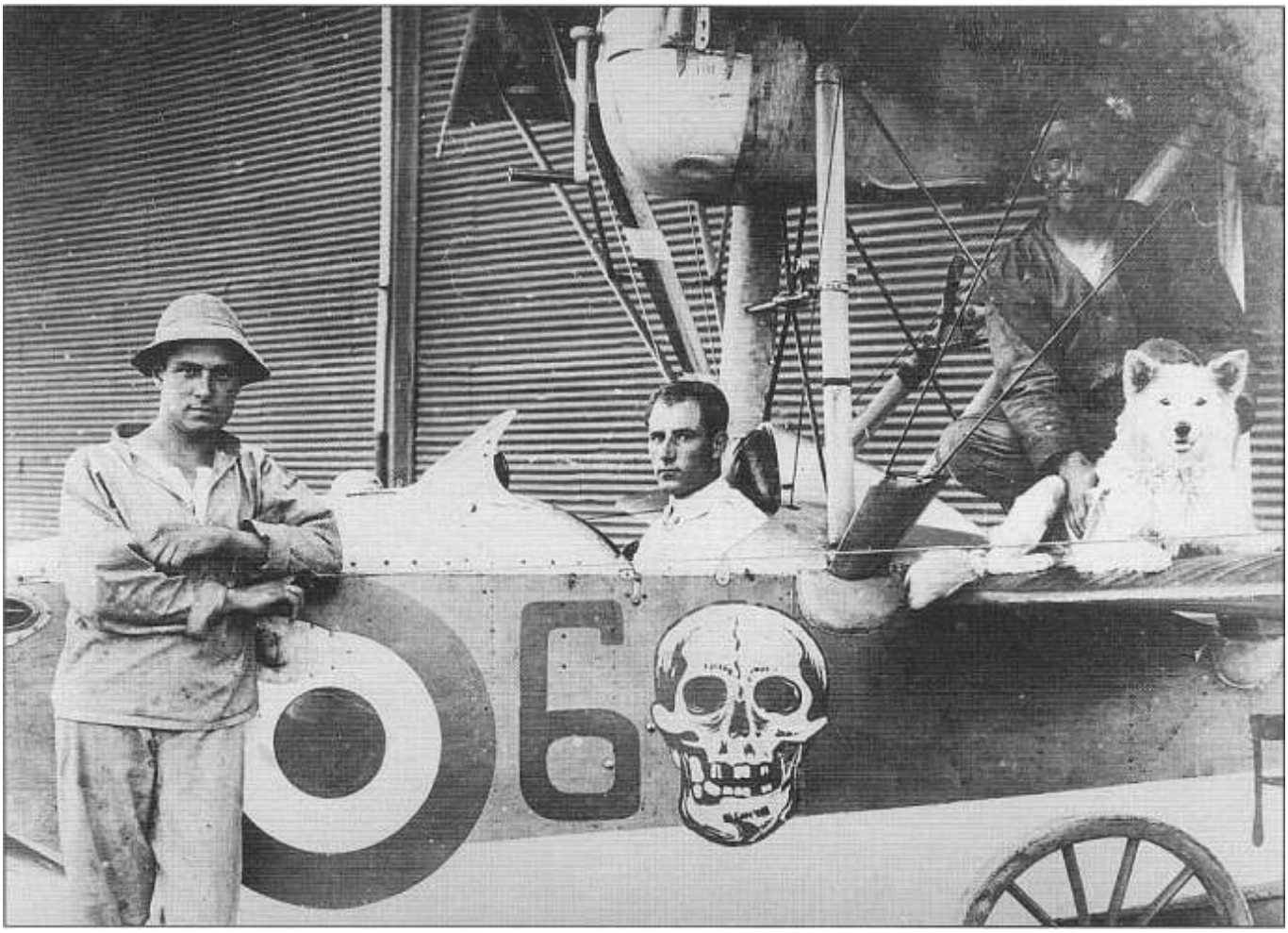
Performance

- Maximum speed: 189 km/h (117 mph)
- Endurance: 3 hours 40 min
- Service ceiling: 6,200 m (20,340 ft)

Armament

2 × fixed, forward-facing 0.303 (7.7 mm) Vickers machine guns.

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THE MODEL

THE MODEL

'HPH Models' - 32035R.

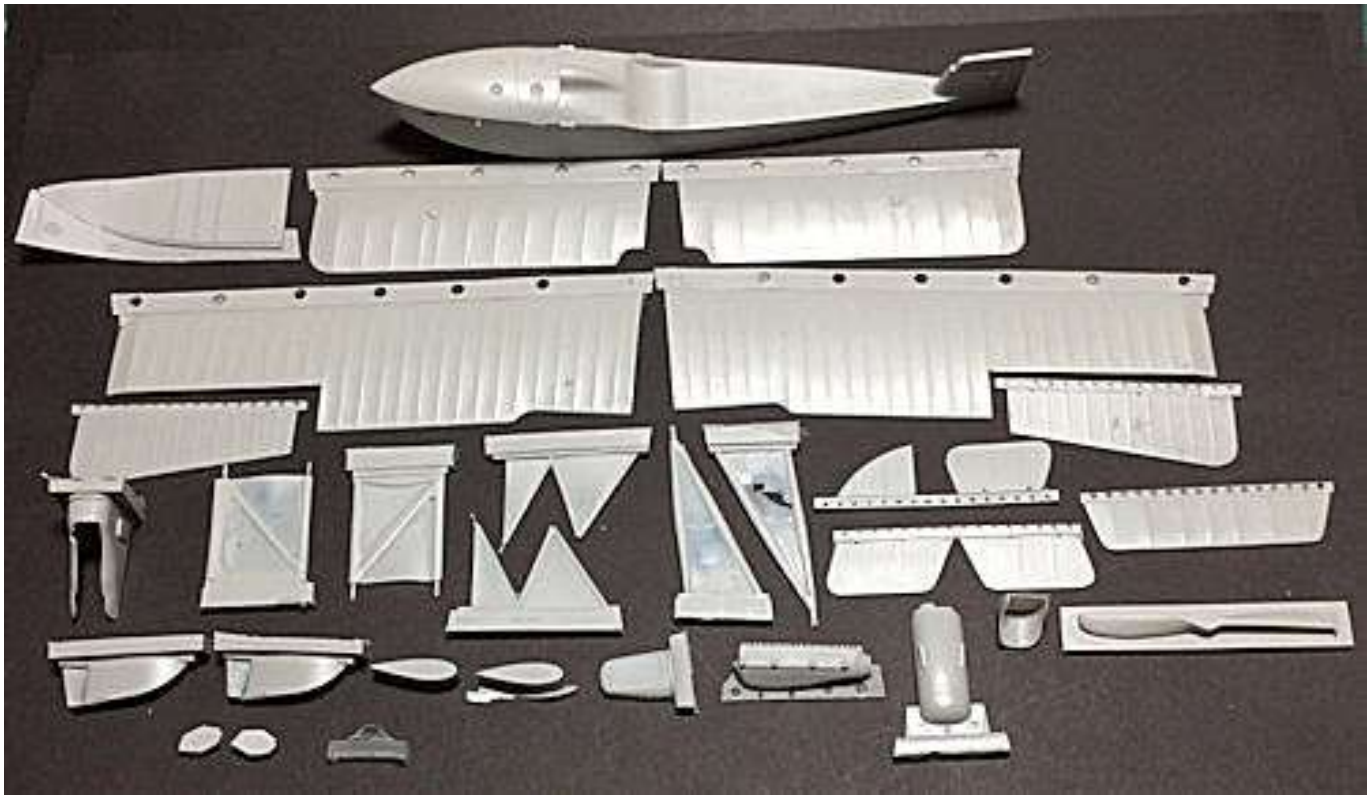
NOTE: ***To build a reasonably accurate model of this aircraft will require experience in modelling, particularly working with resin, as there will be many modifications and enhancements added throughout the build. Definitely not a beginners model.***

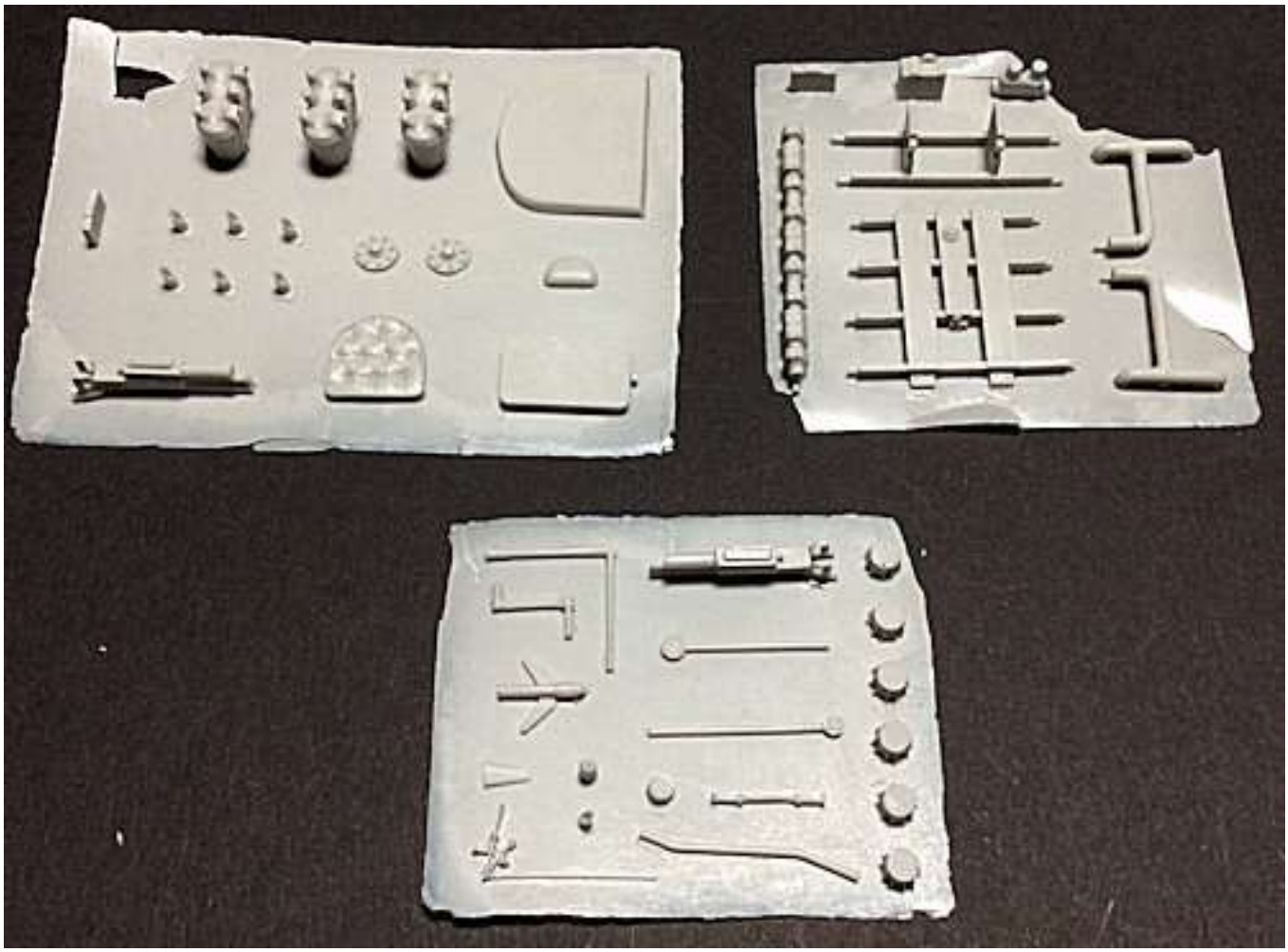
This model depicts the Macchi M.5, Serial No.7288 as flown by Tenente DV Alberto Bartolozzo, Officer Commanding No.260a Squadriglla, operating from Venice during 1918.

The model kit is more suited to the more experienced modellers, especially those who have experience working on resin models. That said, with care and attention, most modellers would be capable of building this resin model.
This model is created entirely from resin, not the 'standard' styrene, so a different approach to building the model must be considered. In many ways resin parts are not as forgiving as styrene. Resin is brittle by comparison and smaller parts are easily damaged. Also CA adhesive must be used t join parts together, as styrene cement has not effect on resin. Although 'HPH Models' cast their resin parts with care, some kit manufacturers can create parts that are warped, incomplete ('short shots') or covered to one degree or another with air 'blow holes', leaving the surface pock marked. Finally resin kits tend not to have the traditional location pins and receiving holes moulded in the parts, for example to join the fuselage halves together. This means additional care is needed to ensure parts are correctly aligned, especially as they are joined using fast setting CA adhesive.
The model parts are packed, in some cases bubble wrapped, in separate compartments within the sturdy kit box. The overall quality of the moulded parts is good with no obvious evidence of warping or surface imperfections. As resin is heavier than styrene, HPH have beefed up the struts in the kit by moulding them with integral metal rods, for additional strength. Great care is needed when working with some of the very small and fragile parts, not only in cutting them away from the base block, but also making sure they are not lost to the 'carpet monster' we so often fall foul of. All parts of the model are moulded onto base blocks or on very thin sheet. Therefore care needs to exercised when cutting these parts away from their bases - parts can easily be damage at this early stage. As is always the case with resin model parts, there is a lot of 'cleaning up' of parts once cut away from their bases, especially with
regard to resin 'flash'. In some cases it's best to leave a small amount of resin at joints etc, so the remaining can then be removed once parts are joined. It's too easy to remove all flash only to find there's a gap in the joint as too much was removed. The kit comes with the typical 'HPH Models' instruction manual, which is in the form of a CD, which can be viewed on a PC or printed from the CD. The manual has captioned photographs for the various stages of the build. At the rear of the manual are colour plates covering the two aircraft colour schemes, with the various markings and decals. Although the instruction manual appears to lack instructional detail, it does cover all of the salient points throughout the build. However some care needs to be taken before committing to assembly of the parts, especially given the parts illustration are not exactly those supplied in the kit and there a few parts supplied that are not shown. Rigging diagrams are provided although the general inter-wing rigging is not that detailed.

The kit parts are supplied in 'area based' plastic bags, but are not protected from contacting each other, which could result in smaller parts being broken. A separate high quality photo-etch sheet is supplied in the kit in addition to a set of fabric seat belts and windscreen transparency. The photo-etch parts for the seat belts are contained on the kit photo-etch sheet, rather than separately with the seat belts. A cut wood set is supplied to create the 'beaching trolley.


Macchi M-5
RESIN MODEL KIT
LIMITED EDITION
No. HPH 32035R
HpH models
Scale 1/32
Seatbelts
Macchi M-5
HPH 32035R





As with most kits, there are always areas or details that can be modified or enhanced and some parts that have errors or inaccuracies that need correcting or making from scratch. The model is no exception. The late ‘Des Delatorre’, a renown modeller, compiled a build log when he made this particular model.

https://www.ww1aircraftmodels.com/page52.html

During his build he picked up on areas of the build that he felt were either incorrect, omitted or not in scale.

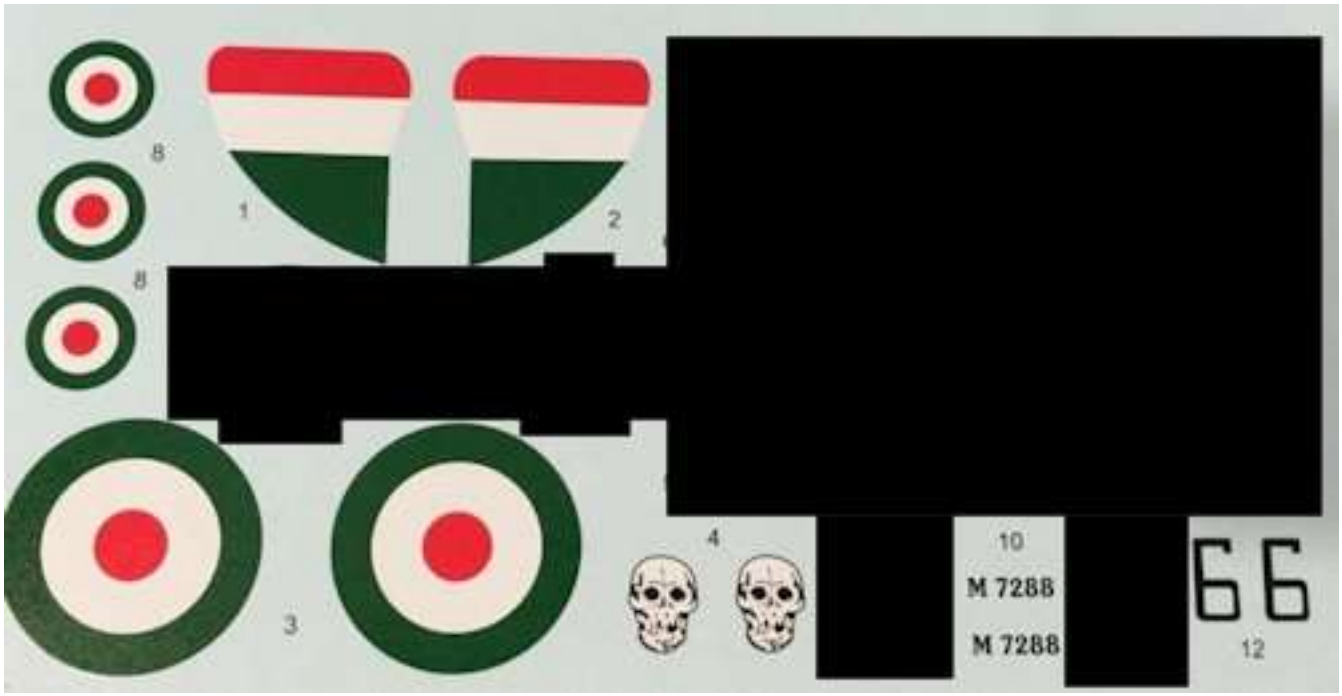
These are detailed later in this build log.

Decals:

The model is supplied with two sets of decals for individual and national markings. However I chose not to use most of these decals due to the following:
1. Photographic evidence shows that for the 260a Squadriglla scheme, no roundels were carried under the lower wing.
2. Only the two manufacturer serial numbers of M 7288 are supplied and are intended to be located each side of the forward bow. In fact the serial number was also located at the extreme rear of the fuselage, fin, rudder, ailerons, wing tips and on the wing ribs closest to the fuselage sides. These additional serial numbers are not supplied in the kit.
3. The Latin legend FRANGAR NON FLECTAR, which was along both fuselage sides and tapered to suit the fuselage shape is not supplied in the kit as a decal or mask.

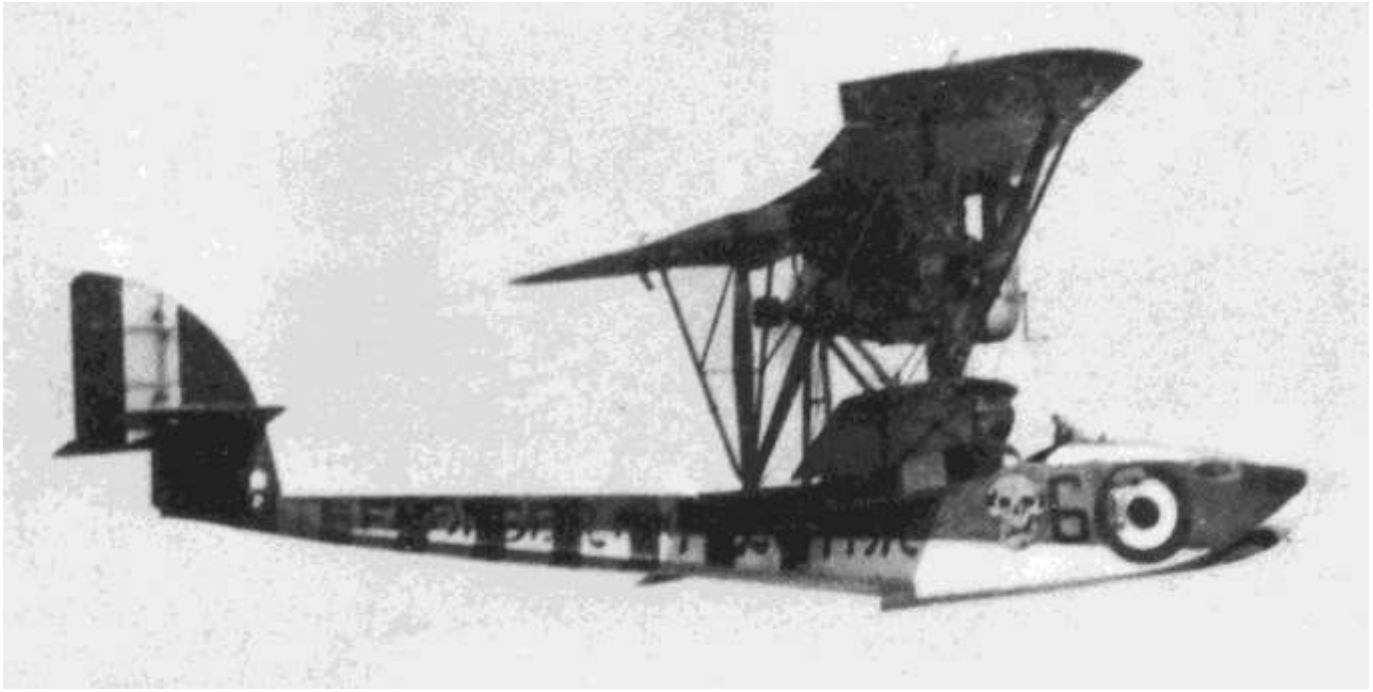
4. These decals are translucent and darker colours under the applied decals will show through.

The following illustration shows those decals not used for this build covered with black boxes.



Those discarded kit decals will be represented later in this build by painting.


FIRST LETTER OF THE LATIN LEGEND
'FRANGAR NON FLECTAR'



PART 1

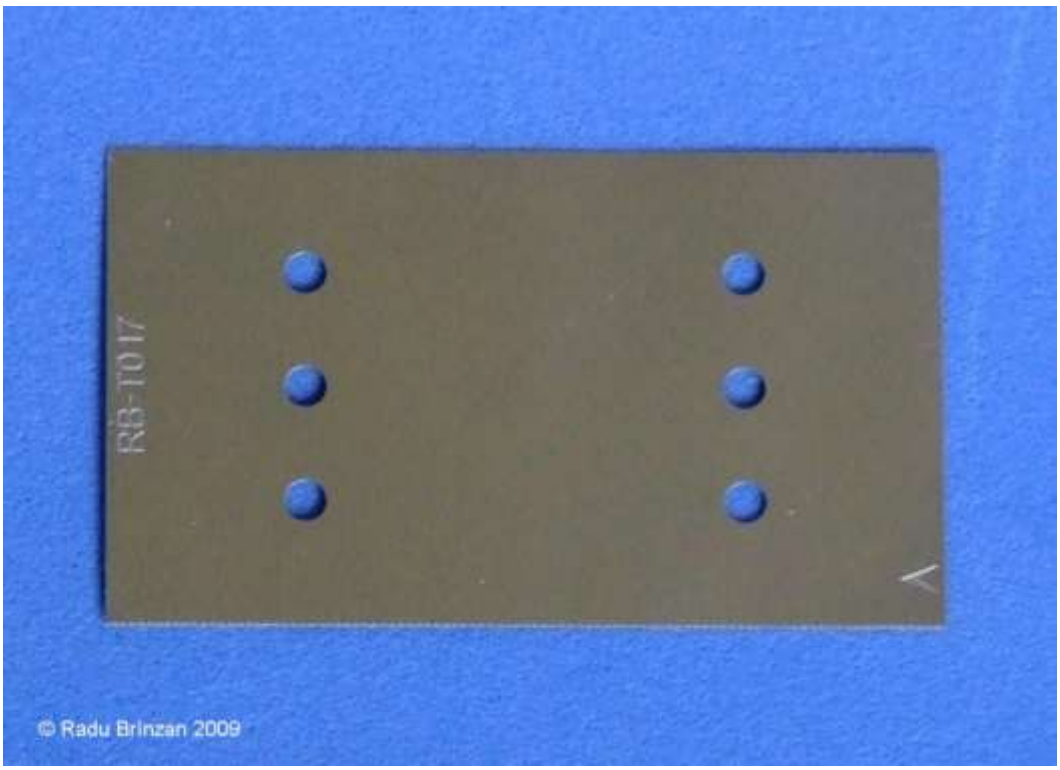
WORKING WITH RESIN (General)

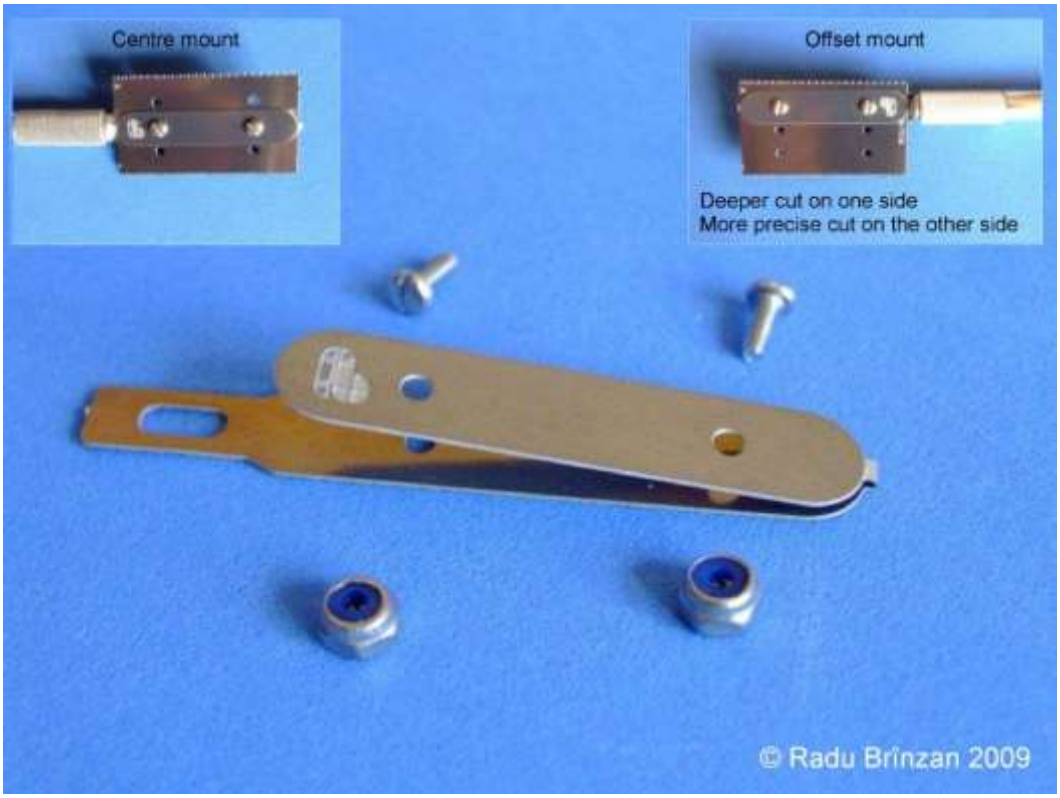
PART 1- WORKING WITH RESIN

This Model is made from resin, as opposed to the normal plastic used. The reason for creating resin kits is that in years gone by, resin kits were able to produce much finer detail on kit parts than the plastic kit equivalents. Even today, there are many producers of resin kits and particularly after market replacement parts. However, plastic kit manufacturers have come a long way now and kits, such as those from 'Wingnut Wings' and 'Copper State' are equal to, if not better than resin kits. Manufacturers of resin kits these days tend to make kits to order or have 'limited' runs, although aftermarket parts are usually readily available. Working with resin does present different challenges to the modeller, especially if it's the first time of building a resin kit. The properties of resin differ radically to those of plastic kits. Below I have listed what I have found to be the primary differences for resin kits from plastic kits:

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.

NOTE: *To separate resin parts from the thin moulding backing sheet, use sharp scissors or a scalpel blade. To separate larger parts from the moulding base block, use a fine modellers saw. The saw I use has a double sided and fine 'drag' saw blade and with its holder is available from 'RB Productions'.*





PART 2

WOOD EFFECTS (General)

PART 2 - WOOD EFFECTS (General)

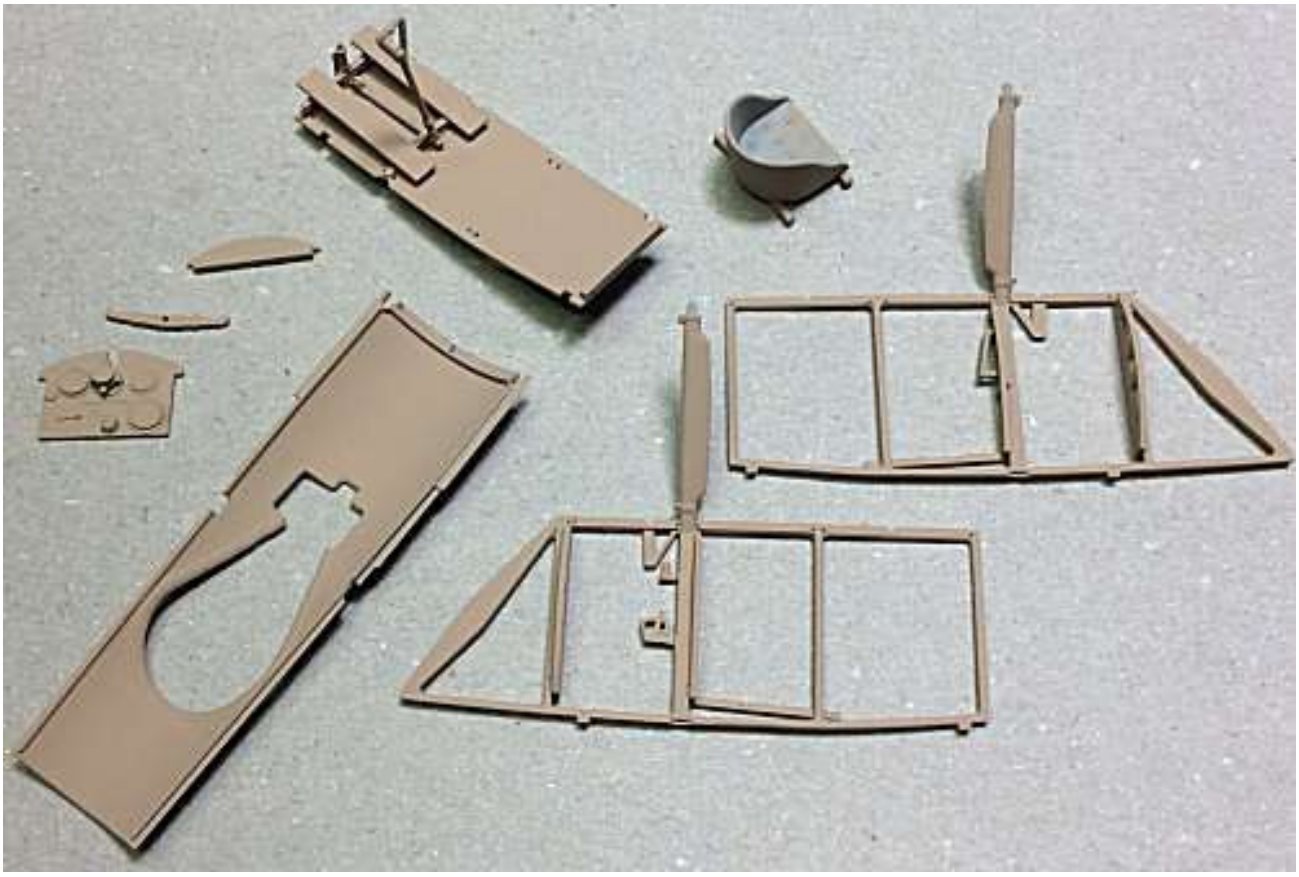
A basic technique:

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, for example 'AK Interactive' Grey (AK-758) primer and micro-filler. Once the primer is dry apply the base colour, after which you can start applying the wood effect to the applicable parts, such as fuselage panels, cockpit items, decking panels and wing struts. With practice, this method can also be used on fuselage panels and propellers.

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. After priming, apply a suitable base colour. For most wood effects, use 'Tamiya' Deck Tan (XF55), Wooden Deck Tan (XF78) or Dark Yellow (XF60), suitably thinned with 'Tamiya' Thinners (X20A). The colour used affects the colour of wood effect applied, so experiment before hand to ascertain the effect you require. 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).



For the next step I use ‘DecoArt Crafters Acrylic’ (water based) oil 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, you can 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.

If I need a further application of oil paint I seal the first application of oil paint with a semi-matte coat (‘Alclad’ Light Sheen (ALC-311 or similar) then once dry, apply a second light of the oil paint. Once painting is complete, clean the brush in water.

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

Once dry, 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 the 'Alclad' 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 this instance, 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 more light coats, 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/'Tamiya' 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, prior to fitting them to the model.

PART 3

WEATHERING
(General)

PART 3 - WEATHERING (General)

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. Once dampened, the dried clay is re-activated and the clay wash can be removed or worked as required. First I seal the surface with airbrushed 'Alclad' Light Sheen (ALC -311) or Semi-Matte (ALC-312), 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 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 used as-is or mixed to create many colour shades for weathering.*

NOTE 5: *If the wash 'beads' on the surface instead of spreading evenly, add a few drops of washing up liquid to the wash, which will break the surface tension of the wash, allowing it to spread.*

NOTE 6: *When the wash is finally sealed it will darken slightly. As the weathering effect is intended to be subtle, it's best to remove more than you think is necessary before sealing. Sealed weathering can't be removed. Additional wash can be applied onto the sealed weathering, as required, and sealed again.*

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. I use a soft brush, which has been very slightly dampened, to brush off the clay wash. For smearing effects, a very slightly damp brush or absorbent paper should be used, but even then I dab them onto a dry piece of the paper, until it's almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, if you'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 more or less straight away. Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure. Once finished, just run the brush under a tap to rinse out any residual clay pigments. Finally I usually seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311) or Semi-Matte (ALC-312), which will seal in the applied clay wash.

Chipping effects:

I wanted to give the effect of chipped and weathered paint/varnish to the metal engine cowl and forward fuselage panels. To achieve this effect, I first primed the areas with 'Tamiya' Fine Surface primer (Grey) then airbrushed 'Tamiya' Aluminium (XF16). Once dry I airbrushed 'AK Interactive' Medium Chipping fluid (or Vallejo chipping fluid) and when dry, top coated with 'Tamiya' Ocean Grey (XF82). Once fully dry I moistened 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) or Semi-Matte (ALC-312).

'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 brushed and fixed with solutions, applied sparingly, such as White Sprit or 'Tamiya' X20a thinners.

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 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).

Another good product are the oil brushers, produced by ‘Ammo’ by Mig Jemenez. These are made with modellers specifically in mind. The oil paint is applied from the brush then blended using their odourless thinners. The oil brushers are supplied as specific colouring sets or individually.

PART 4

DECALS
(General)

PART 4 - DECALS (General)

Standard decals:

The supplied markings decal sheet and the optional 'lozenge' decals sheets 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. The decals appear not to be laser printed, as with for example 'Cartograph' decals, and backing sheet is thicker than standard decal sheets. This makes it difficult to achieve a clean cut around the decals. The decals are not of the best quality, which is to be expected from a 'limited run' kit of this type and given that they have to be carefully cut out from the sheet may make the end result less than favourable.

One alternative to using these decals is, where possible, is to source replacements from commercial retailers or from your 'spares' collection if you have one. This would only apply to the larger 'standard' markings as the smaller and specific model decals are unique and would still need to be used.

A second alternative for the larger markings would be to create masks and airbrush the markings, although this would require specific masks and is not a method advised for the less experienced modeller. Again the small and specific models decals would still need to be used.

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 'Johnson' Pledge Floor Care finish 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 'Johnson' Pledge Floor Care finish, 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 'Johnson' Pledge Floor Care finish 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' linen effect 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. For this model I chose to use the 'clear' decals, in order to show the linen effect more visibly.

Application:

First airbrush a primer coat of 'AK Interactive' primer and micro-filler (White - AK759) on all of the surfaces to have the decals applied.

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 polished out.

Airbrush at least two light sealing coats of either ‘Alclad’ Clear Coat Gloss (ALC-310) lacquer, ’Alclad’ Aqua Gloss (ALC-600), ‘Tamiya’ Clear (X22) or ‘Johnson’ Pledge Floor Care finish (similar to ‘Future’), all of which will 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.*

The decals are applied following the supplied ‘Aviattic’ instruction sheet.

PART 5

FLIGHT CONTROL RIGGING (General)

PART 5 - FLIGHT CONTROL RIGGING (General)

General:

The first thing to check is that you have already drilled out the rigging attachment points. 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 etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have 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 re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.

With your research complete and all necessary holes pre-drilled, the rigging can start. For structural strength I use mono-filament (fishing line) of various diameters. These can be semi-transparent but do give a look of steel, without the need of painting or colouring with a gel pen.

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

Rigging and bracing cables fitted to aircraft of this period varied, dependent on the nationality of the aircraft and its individual design. For instance, German aircraft used traditional round, braided cables, whereas later in the war aircraft of the RFC and RAF used solid metal aerodynamic (streamlined) flight rigging and traditional round cables for flight controls. French aircraft used either and sometimes the flight rigging was coloured blue. Finally the methods of actually attaching and adjusting the flight rigging and controls varied. For instance, the attachments for RFC and RAF aerodynamic rigging was different to that for round braided cables, which for adjustment, required turnbuckles. Some German aircraft had attachments with ball end fittings to allow for self alignment of the rigging cables.

The 'streamlined' wires can be modelled using the relevant sized flat, photo-etched sets from 'RB Productions'. However, these can be difficult to install and require tiny photo-etch end fittings, which some modellers think are over-sized. More importantly, these wires add no structural strength the a model and apparently can be prone to 'sag' if the ambient temperature changes too much. It's for these reason I choose to use mono-filament (fishing line) for all of the rigging, as it does add structural strength to a model and can be tightened after fitting by apply heat close and along the rigging line. My line of choice is mono-filament with 0.12 mm diameter by 'Steelon' for rigging and 0.08 mm 'Stroft' for control lines. When lightly airbrushed with a matt or semi-mat lacquer, it looks close enough to steel to be passable. Besides, to the naked eye it's difficult to tell the difference between the flat photo-etch and the round mono-filament.

Holes need to be provided for routing the rigging wires, so study the rigging illustration and model parts thoroughly to find the various rigging points.

Macchi M.5 - general rigging:

The general rigging, such as flying and landing wires and cross bracing is covered in Part 7 (Preparation with Modifications) of this build log.

Macchi M.5 flight controls:

I believe the control rigging shown in the 'HPH Models' instruction manual is incorrect for the following reasons:

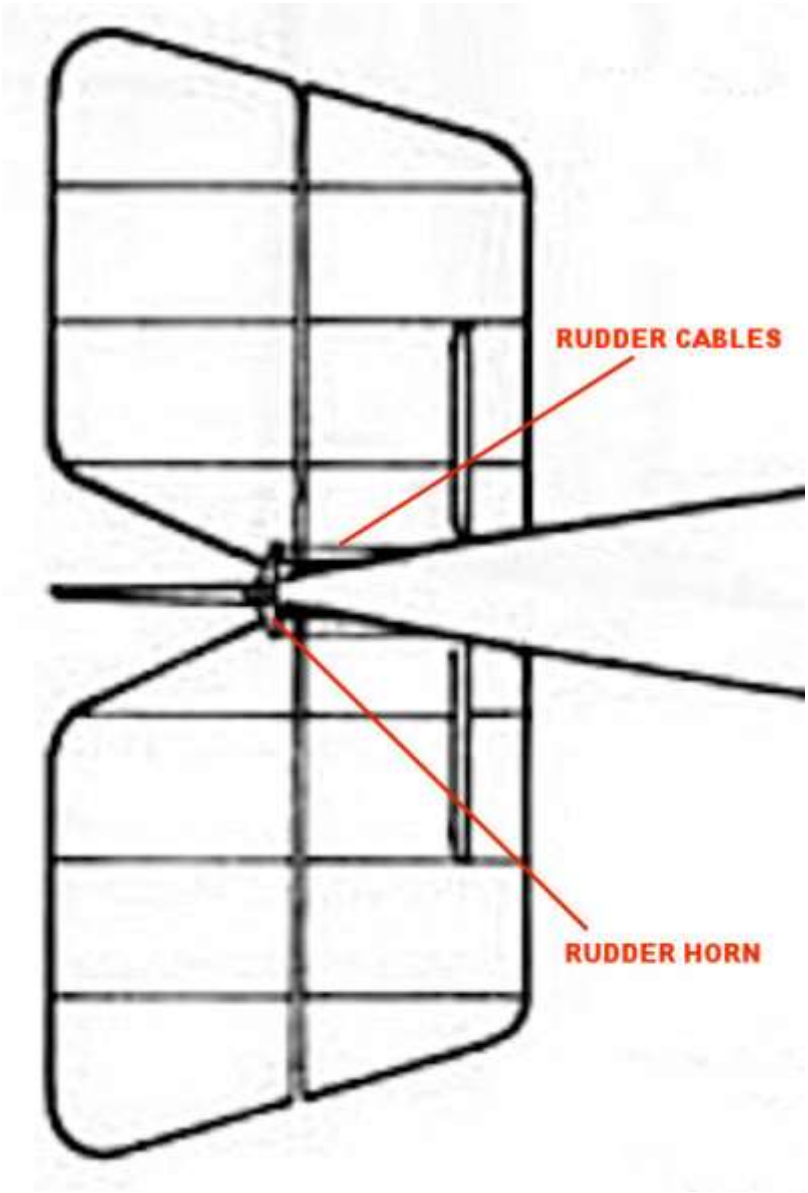
Rudder:

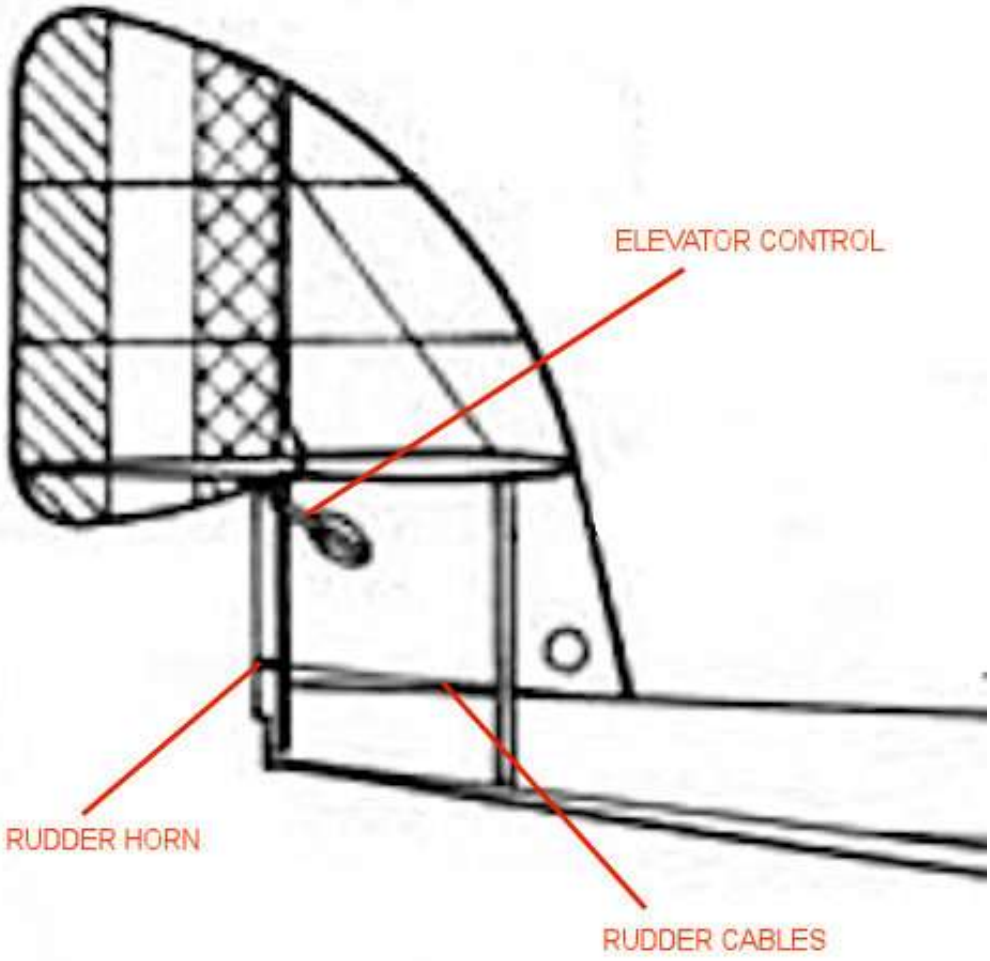
The instruction manual shows the control cables for the rudder exit through the aperture in the upper, rear of the fuselage fin support fairing then routing to the rudder control horns, located at each side and towards the bottom of the rudder.

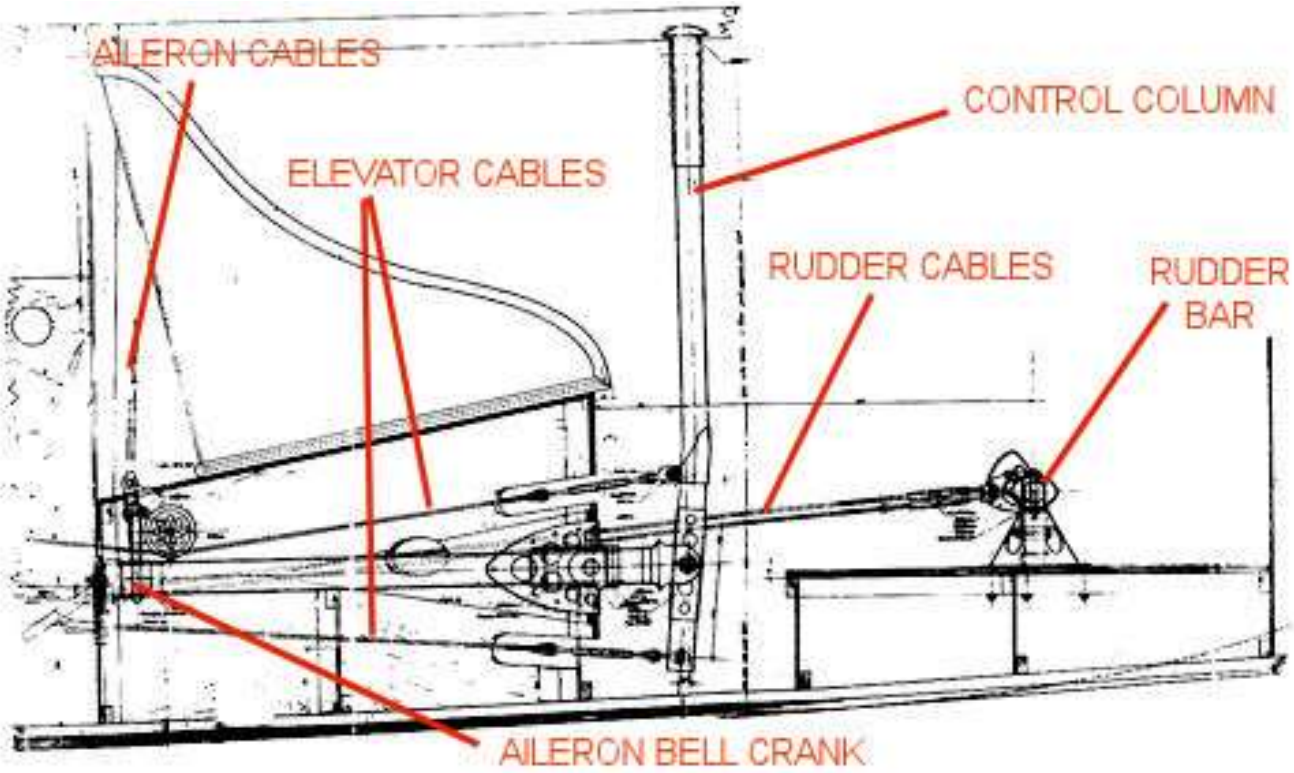
However the following illustrations appear to show that in fact the rudder control cables were attached to each side of the pilot's rudder bar in the cockpit and from there were routed rearwards, under the pilot's seat and through openings in the top, rear of the fuselage.

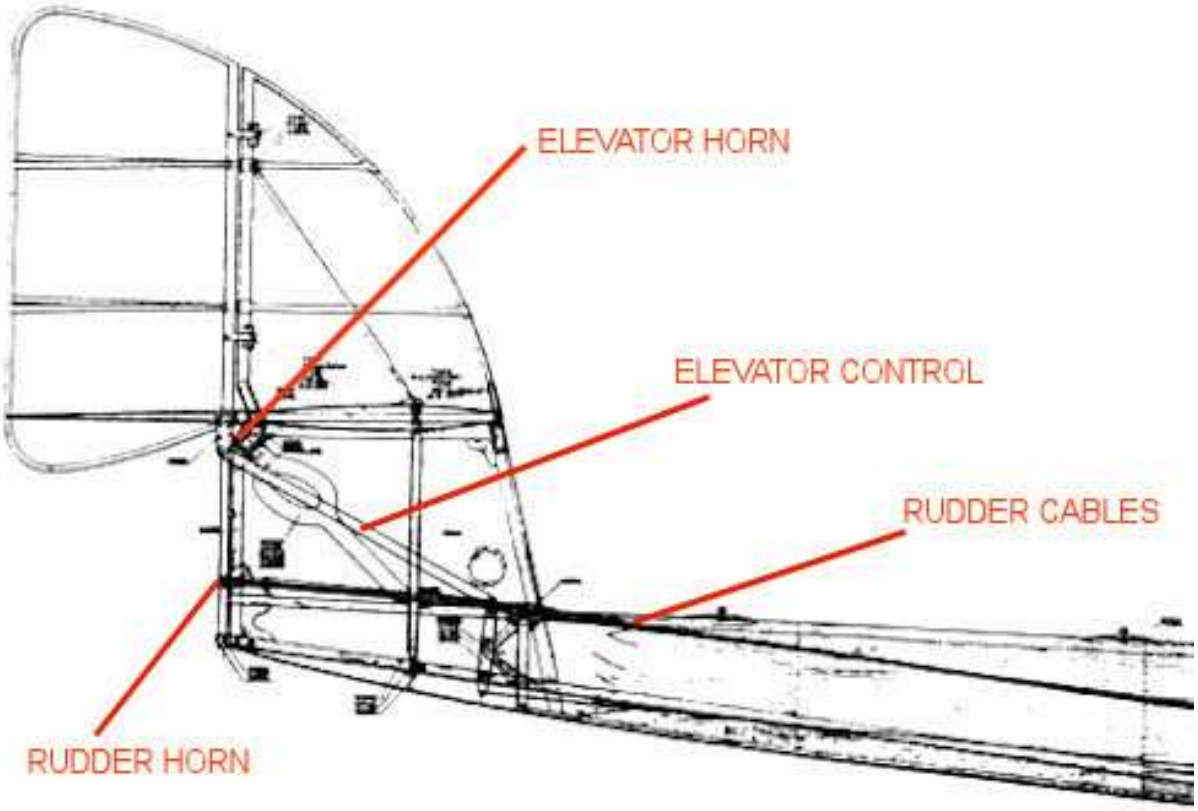
From there the cables were routed below the tail plane and connected to the rudder horn at each side of the rudder. The control horns were fitted to the rudder post and below the rudder.

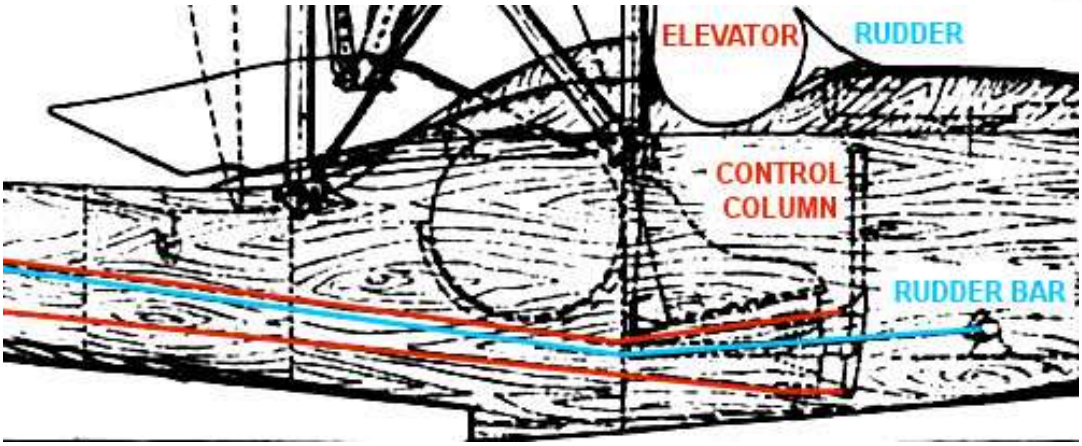
Moving the cockpit rudder bar left or right would pull on the rudder control horn, rotating the rudder post and therefore the rudder left or right.

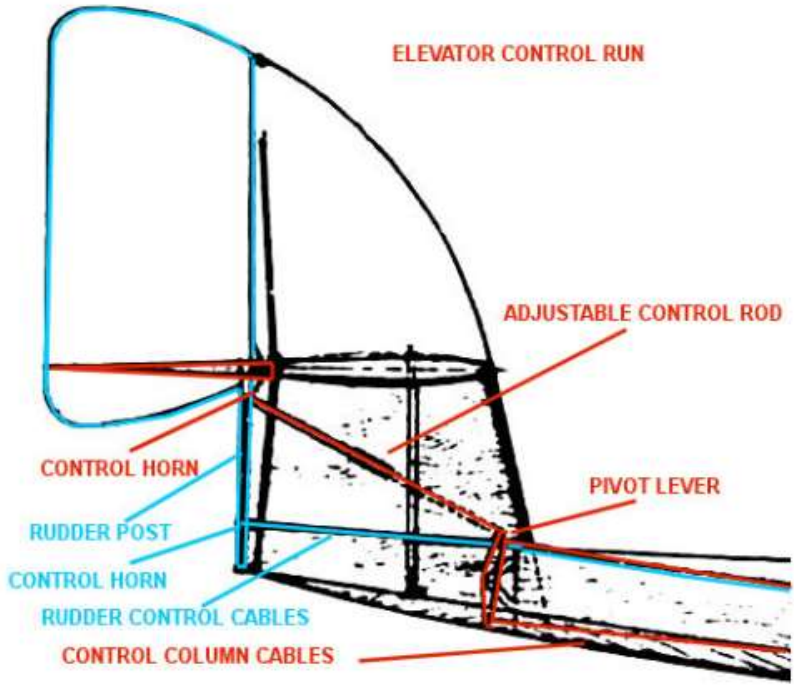



ELEVATOR CONTROL
RUDDER HORN
RUDDER CABLES


AILERON CABLES
CONTROL COLUMN
ELEVATOR CABLES
RUDDER CABLES
RUDDER BAR
AILERON BELL CRANK


ELEVATOR HORN
ELEVATOR CONTROL
RUDDER CABLES
RUDDER HORN

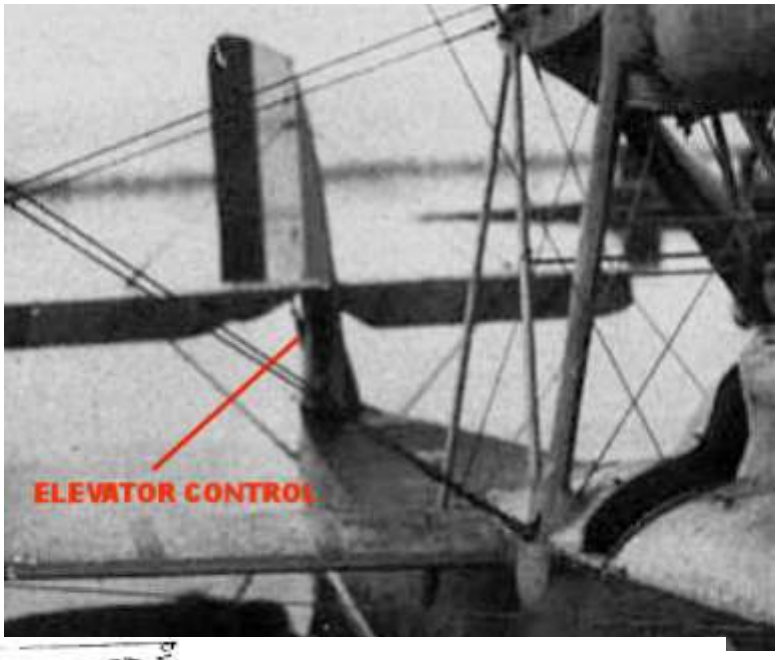

ELEVATOR
RUDDER
CONTROL COLUMN
RUDDER BAR

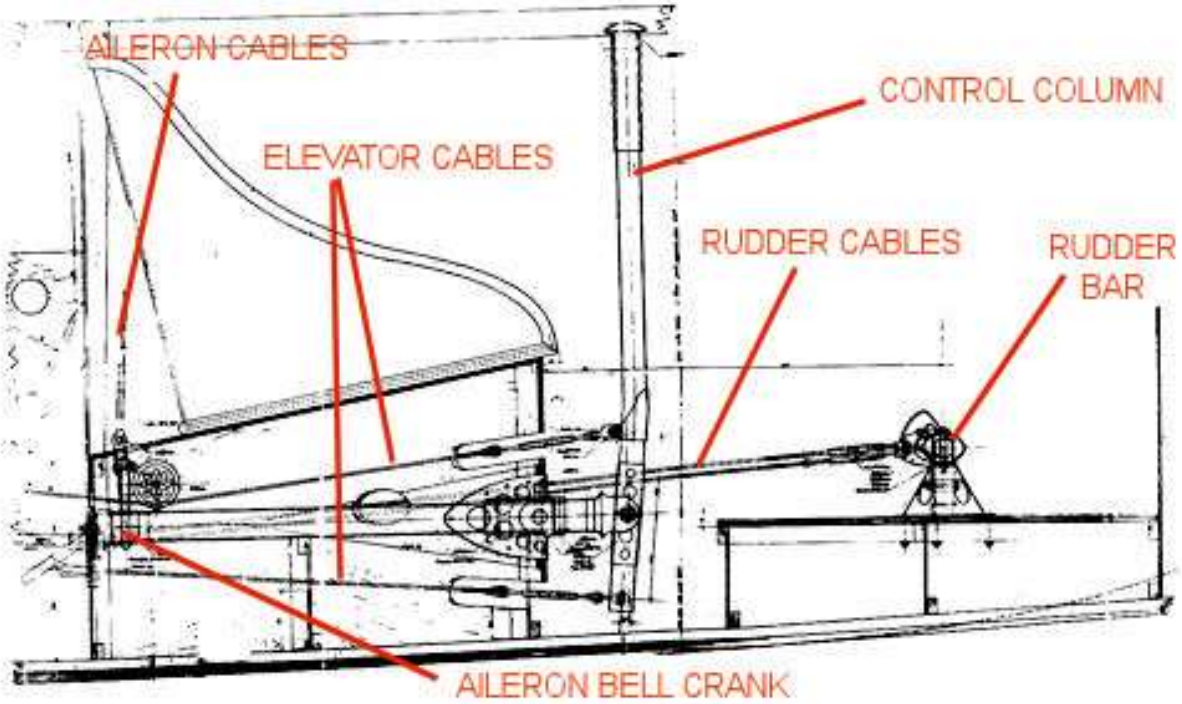

ELEVATOR CONTROL RUN
ADJUSTABLE CONTROL ROD
CONTROL HORN
PIVOT LEVER
RUDDER POST
CONTROL HORN
RUDDER CONTROL CABLES
CONTROL COLUMN CABLES

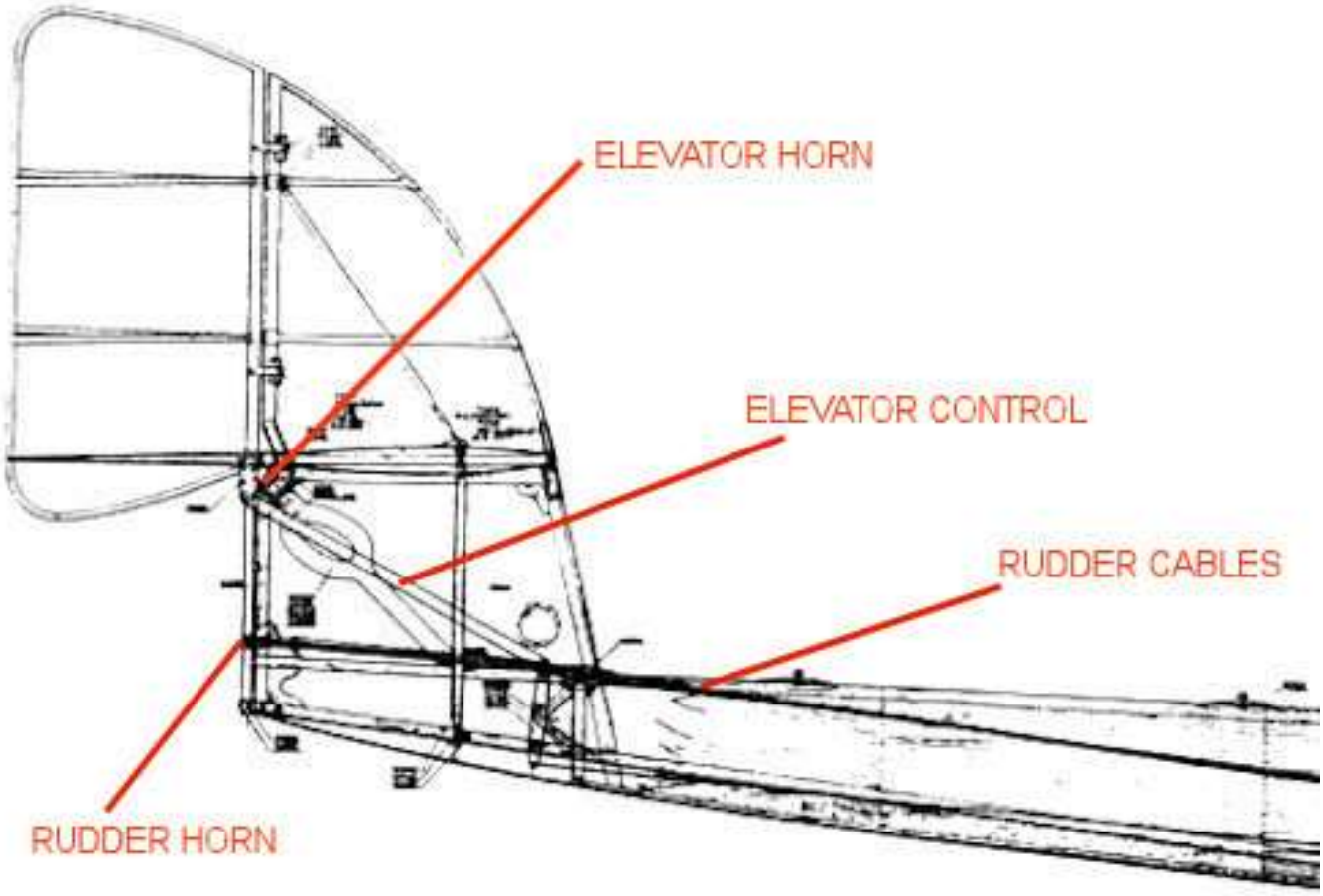
Elevator:

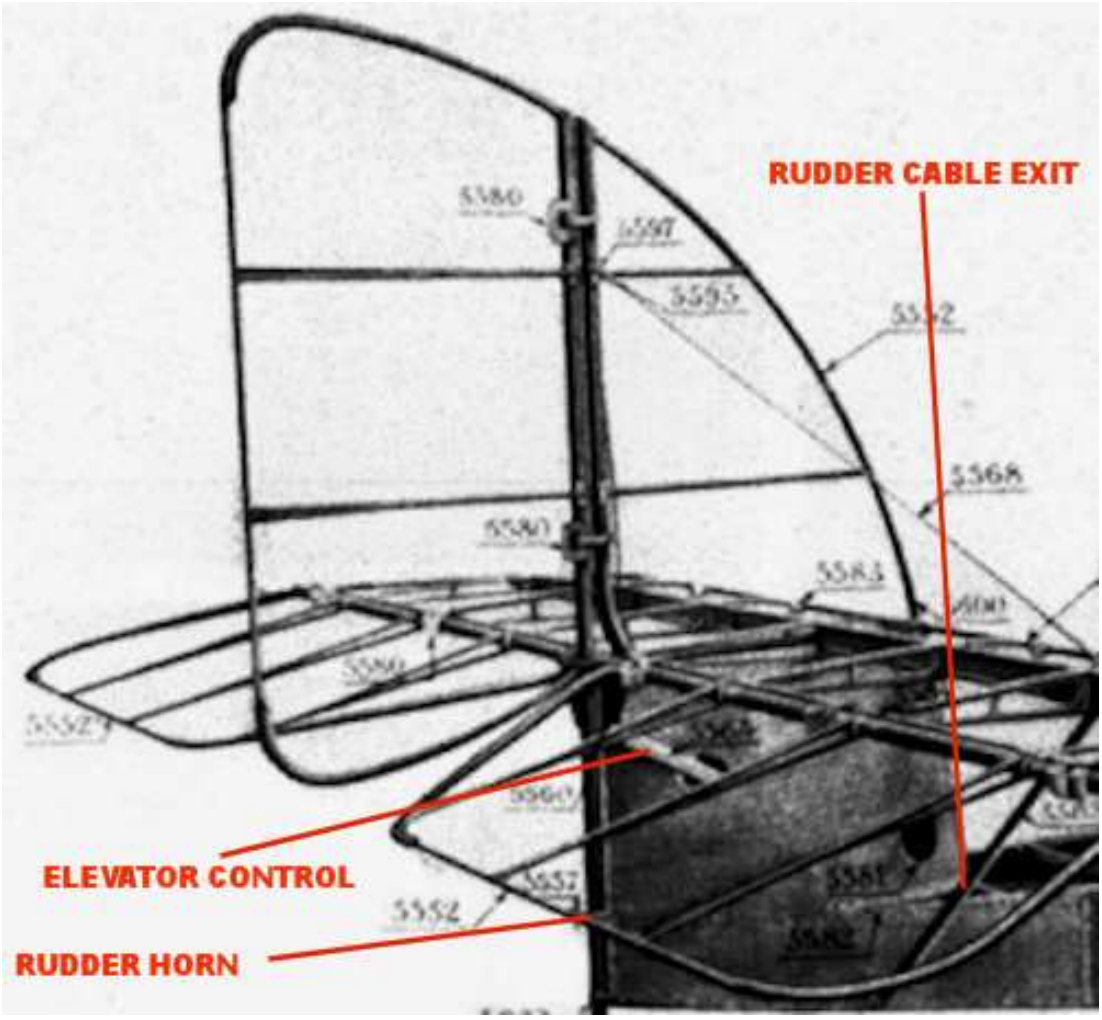
The instruction manual shows the control cables for the elevator exit through the aperture in the upper, rear of the fuselage fin support fairing then routing to the elevator control horns, located under the elevators.

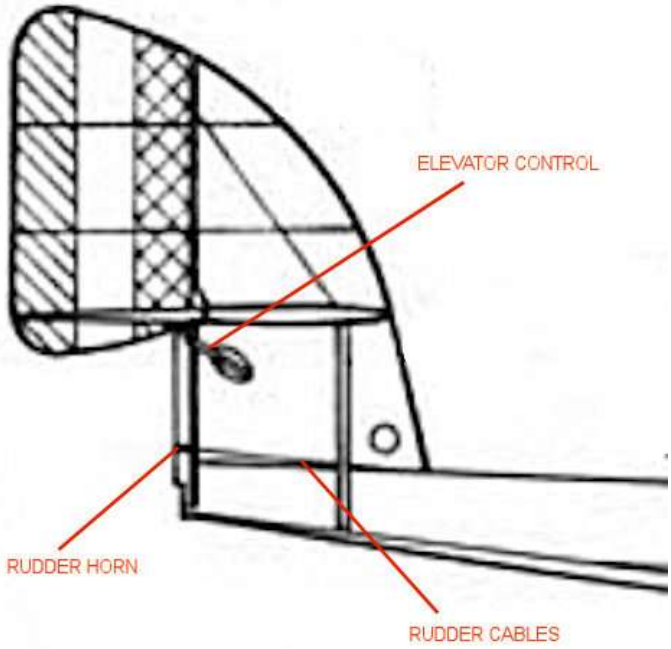
The following illustrations appear to show that the elevator control cables were connected the control column, above and below its pivot point. From here they were routed rearwards and under the pilot's seat to the rear of the fuselage. It seems that here they were connected to each end of a lever, which was itself attached to a pivoting bar routed across the rear fuselage. At each side of this lever were levers, which were attached by a adjustable control rods, through the open aperture in the fin support fairing, to each side and the control horns under each elevator half. As the control column was moved forwards or rearwards (dive or climb), the relevant control cable would pull on its end of the central lever and rotate the pivoting bar in the rear fuselage. This in turn caused the two outer levers to rotate forwards or rearwards and either pull or push their adjustable control rods. This would cause the elevators to move up or down. This method of operation would only require control horns to be fitted under the elevators (as can be seen in the following illustrations) as opposed to the more traditional upper and lower control horns operated by cables.

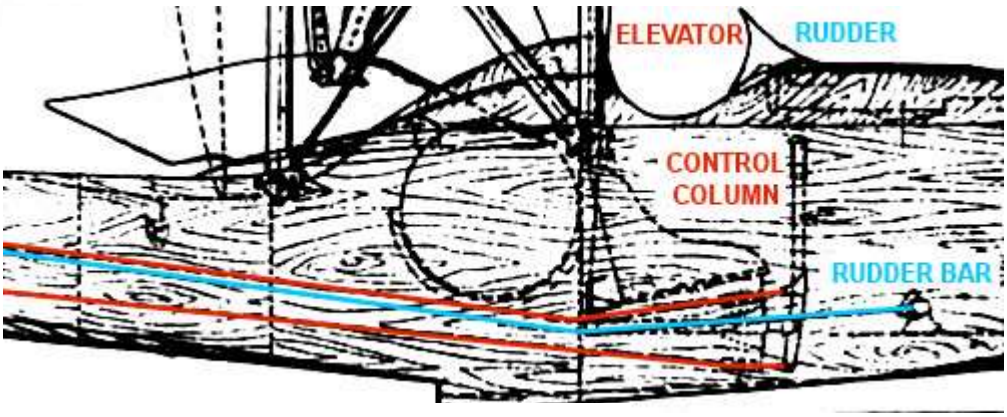


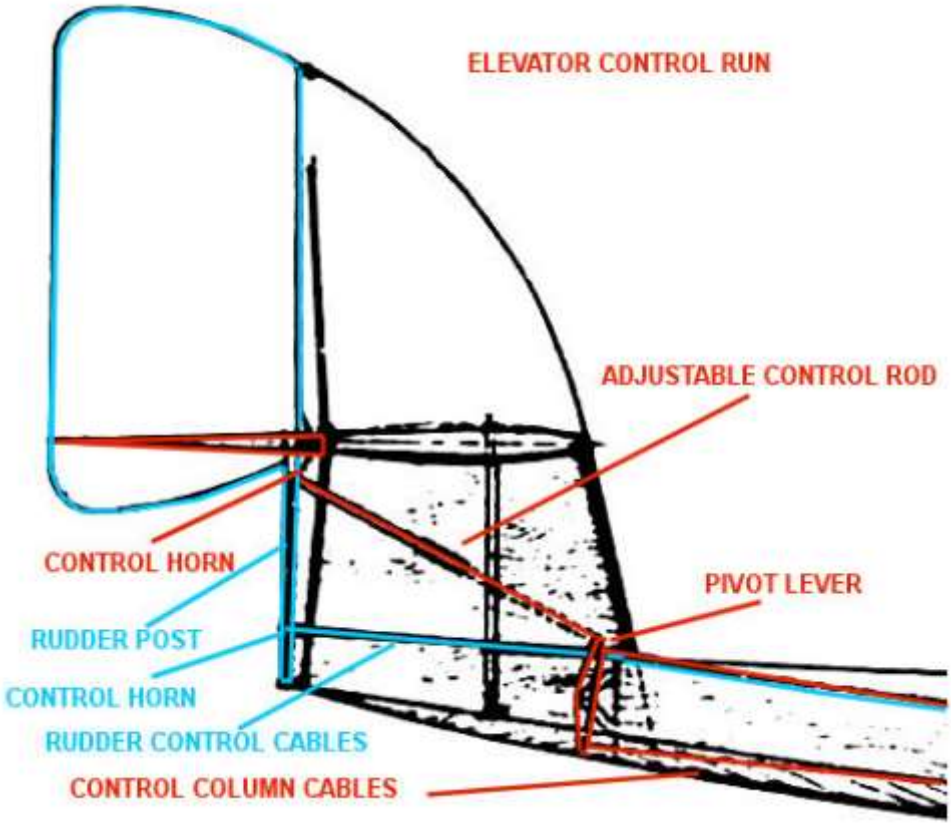



ELEVATOR HORN
ELEVATOR CONTROL
RUDDER CABLES
RUDDER HORN


RUDDER CABLE EXIT
ELEVATOR CONTROL
RUDDER HORN


ELEVATOR CONTROL
RUDDER HORN
RUDDER CABLES

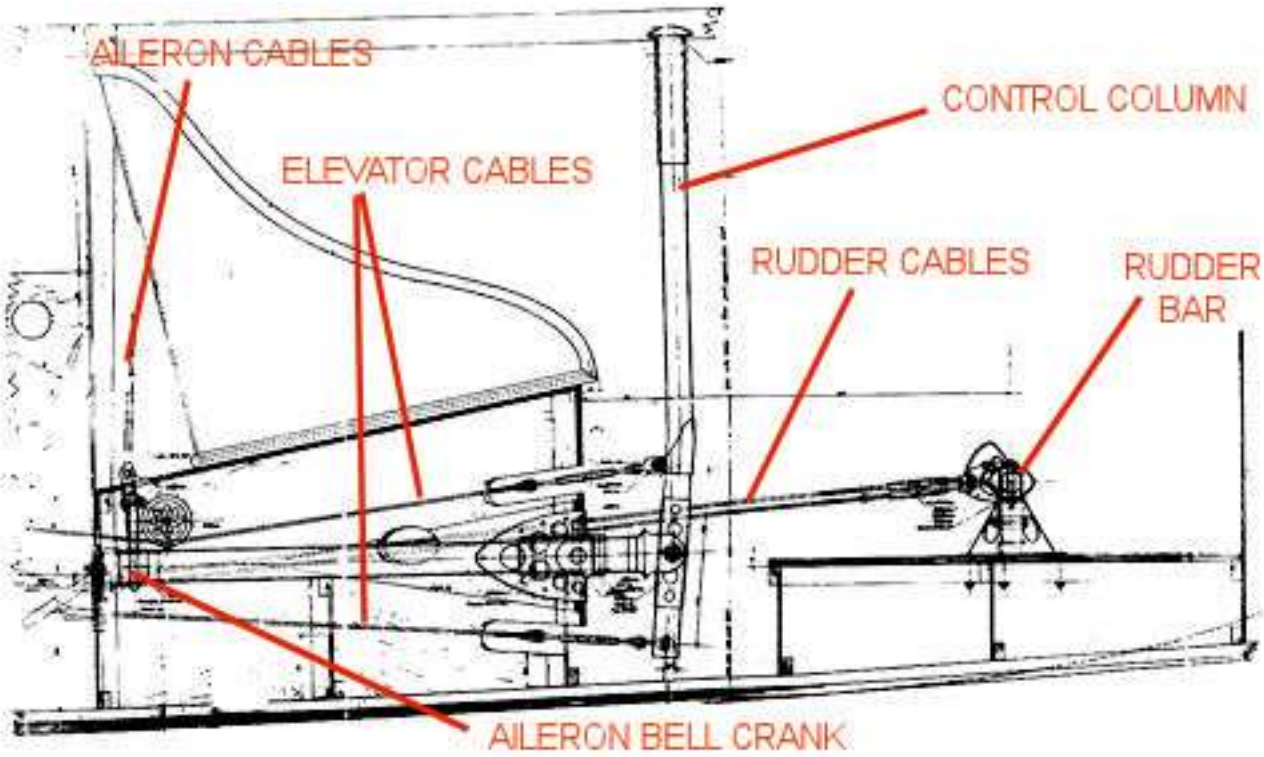

ELEVATOR
RUDDER
CONTROL COLUMN
RUDDER BAR

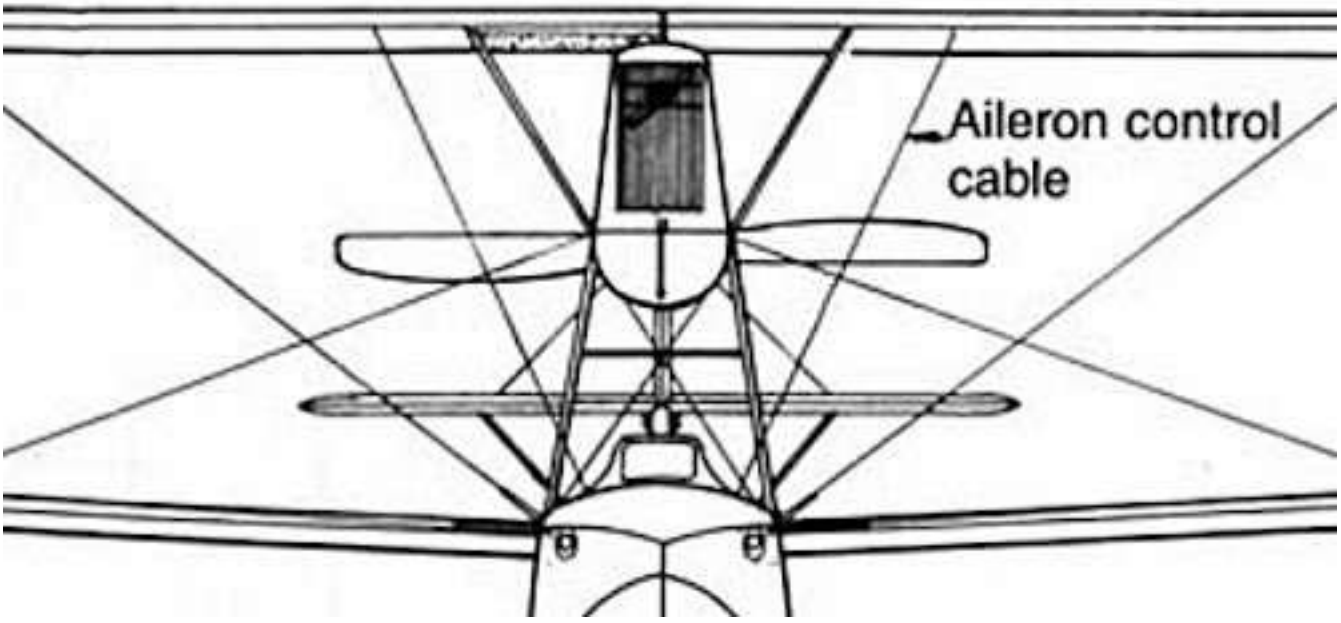

ELEVATOR CONTROL RUN
ADJUSTABLE CONTROL ROD
CONTROL HORN
PIVOT LEVER
RUDDER POST
CONTROL HORN
RUDDER CONTROL CABLES
CONTROL COLUMN CABLES

Ailerons:

The instruction manual does show the aileron cables connected from the rear cockpit decking to the underside of the upper wing. The models upper wing does have the aileron inspection windows detailed at each side of the wings underside, but only as raised detail.

The pilot's control column was connected to a torsion bar which was routed rearwards under the pilot's seat. At the rear end of this bar was a bell crank with an aileron control cable connected to each side of the bell crank. These control cables were routed up and out of the fuselage through apertures in the fuselage rear decking, at each side behind the pilot. From here the cables were routed up and into the underside of the upper wing. The cables were routed around pulleys and outboard to other pulleys, which turned the cables rearwards and out of the wings upper and lower surfaces to the upper and lower control horns on the ailerons.






AILRON INSPECTION WINDOWS
AILERON CABLE

PART 6

PROPELLER

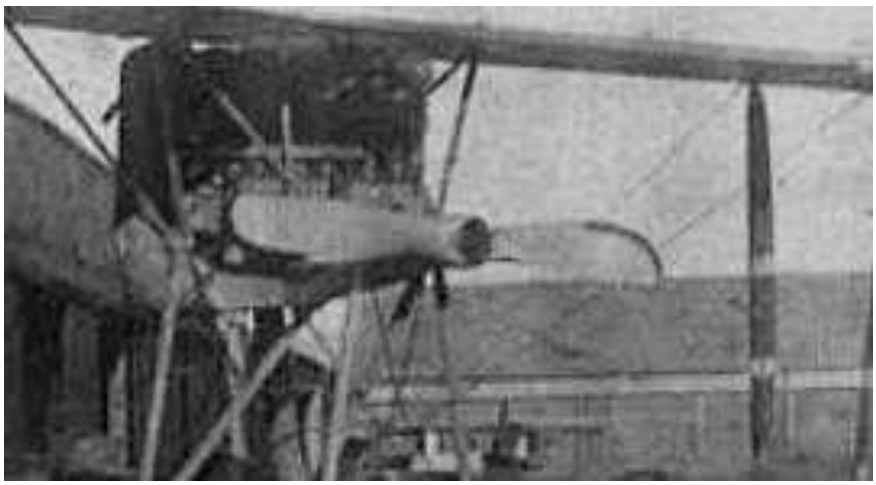
PART 6 - PROPELLER

The propeller supplied in the kit is of good quality. However when fitted to the engine, the propeller tips do not clear the curved trough in the top of the fuselage, below the engine. This can be resolved by either sanding out the trough or reducing the propeller overall diameter, until the propeller clears the trough.
For this model build I chose instead to use a hand made and laminated wood propeller, which was made for me by Alex at 'ProperPlane', based on what information I could supply.

The actual manufacturer of the propellers for Macchi aircraft is unclear and some propellers may have been 'painted' with a light coloured waterproof coating although 'standard' wood varnishes were also used. The light colour of propellers in photographs may also be due to light coloured wood being used for the propellers and possibly light reflection. What is certain is that the outer edges of the propellers were protected from damage and splitting by metal sheathing.

Metal sheathing was attached to early propellers, but was discontinued by 1913 as there were many fatal accidents when these metal protectors became detached. Sheathing was revived later when it became apparent that propellers made of softer woods needed protection, especially from water spray on flying boats. The sheathing was typically made from either Copper, Tin or Monel (Nickel-Copper alloy) and was fitted around the leading edges of the propeller tips. The sheathing was secured onto the propeller either with screws or rivets, the exposed heads of which were soldered and smoothed down.

Photographs of light coloured propellers and metal sheathing.



The ‘ProperPlane’ propeller as supplied

NOTE 1: *Remember that the engine and propeller for the Macchi M.5 were of a ‘pusher’ configuration. That is the propeller, rather than being at the front of the engine ‘pulling’ the aircraft forwards, it was at the rear of the engine, ’pushing’ the aircraft forwards.* ***Make sure you check which way the propeller should be fitted by looking at photographs.***

NOTE 2: *As the apparent light colour of propellers is uncertain, I chose to apply a more traditional wood varnish effect to the propeller.*

Make sure the wooden propeller is perfectly smooth and lightly sand if necessary.

Cut a length of 1.4 mm diameter brass tube (e.g. ‘Albion Alloys’ MBT14) approximately 15 mm in length.

Insert the tube into the hole at the rear of the propeller.

Position the end of the tube flush or just below the rear face of the propeller. Don’t have the tube protruding or it will stop the front propeller boss seating fully onto the propeller face.

Secure the tube in position with CA adhesive.

Airbrush light coats of ‘Tamiya’ Clear Orange (X26) mixed with a small amount of ’Tamiya’ Hull Red (XF9), thinned with ‘Tamiya’ X20A thinners, to obtain the darker varnished look of the wood.

Once dry, airbrush a light sealing coat over the propeller (e.g. ‘Alclad’ Light Sheen (ALC-311) Lacquer, ‘Tamiya’ Semi Clear (X35) or similar.

Carefully cut off the two bosses from their moulding block and sand the mounting faces to the correct thickness.

Brush paint the two propeller bosses with ‘Mr. Metal Colour’ Stainless Steel (213) and once dry, buff to a metallic sheen.

Position the front boss onto the propeller, making sure it is fitted onto the correct side of the Propeller (facing to the rear of the aircraft). Secure in position using CA adhesive.

Position the rear boss onto the pre-installed propeller shaft and slide it up to the rear of the propeller. Secure in position using CA adhesive.

Refer to the previous photographs and brush paint the protective metal sheathing around the propeller tips, using either ‘Mr. Colour’ Copper (215) or Stainless Steel (213).

PART 7

PREPARATION WITH MODIFICATIONS

PART 7 - PREPARATION WITH MODIFICATIONS

NOTE: *All assembly of all parts is carried out using CA adhesive.*

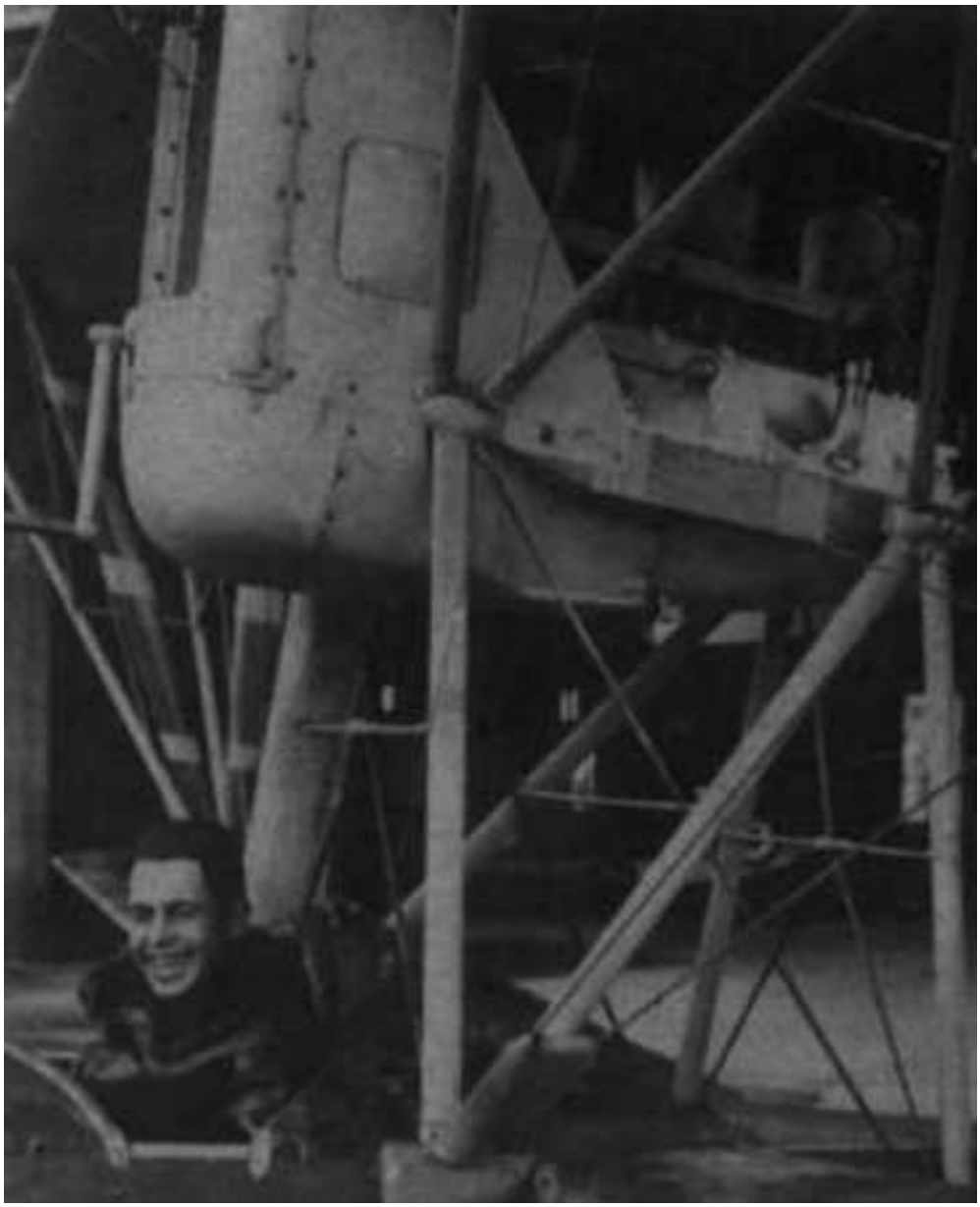
The late 'Des Delatorre', a renown modeller, compiled a build log when he made this particular model. During his build he picked up on areas of the build that he felt were either incorrect, omitted or not in scale.

https://www.ww1aircraftmodels.com/page52.html

In summary:

Re-shaping of rear fuselage for fin to fit.
Additional cross brace bars to engine support frame - not rigging as shown in manual.
Outer wing 'H' brace struts not supplied in the kit.
When fitted to the rear of the engine, the propeller does not miss the clearance trough in the fuselage.
Decals thin and semi-transparent, requiring white addition.

He also noted that the cockpit seemed to be too small, especially when all of the various components were fitted. Although it does appear to be much smaller than expected, photographs of pilot's sat in the cockpit would indicate that it was in fact that small.



Whether any or all of the apparent areas of concern have been addressed by ‘HPH Models’ since the build by ‘Des’ remains to be seen, but whatever, there will be parts either corrected, modified or made from scratch. Such is modelling and especially when working with resin ‘limited run’ kits.

Preparation:

NOTE 1: *To separate resin parts from the thin moulding backing sheet, use sharp scissors or a scalpel blade. To separate larger parts from the moulding base block, use a fine modellers saw. The saw I use has a double sided and fine ’drag’ saw blade and with its holder is available from ’RB Productions’. When removing parts from their resin backing or base blocks, always leave a small amount on the part, to avoid cutting into the model part itself.*

NOTE 2: *Take care when removing the various struts from their backing, as they have steel rods moulded inside. Some of these rod ends are moulded inside the struts moulding block and need to be cut around. Also some of these rods may not protrude through the ends of the struts, which they should. In this case drill a hole of 0.5 mm diameter into the resin at the end od the strut to reveal the end of the rod. Then holding the other end of the rod, carefully twist and push the rod through.*

NOTE 3: *The fuselage is mould as a solid, single piece. The cockpit opening and two forward ports will need to be ‘opened up’. Also the top of the fuselage fin support, rear edge of the fuselage and tailplane assembly need to be worked.*

Remove all model parts from their backing sheets or moulding blocks.

File or sand away any resin flash and remains of the moulding blocks.

Fill any surface imperfections, such as ’blow holes’, with putty then sand smooth.

Fuselage tail unit:

Open up the aperture through the top rear of the fuselage support fairing.

Drill a hole of 0.5 mm diameter through the centre line of the tail plane at the two pre-moulded indents.

Drill two corresponding holes into the base of the fin.

Insert two short lengths of 0.5 mm brass rod (e.g. ‘Albion Alloys’ MBR05) or similar.

Secure the rods in position with CA adhesive.

Position the fin onto the fuselage support fairing and mark the location of the two rods.

Drill two corresponding holes into the top of the fuselage support fairing.

Test fit the fin into the tail plane and then into the fuselage support fairing. Make sure the tail plane is horizontal and the fin is vertical.

Drill a hole of 1.0 mm diameter into the top of the fuselage, close to the outer edges and angled back towards the back of the fuselage support fairing. These will be used later for the rudder control cables.

At the bottom rear corner of the fuselage, file a step for clearance of the added rudder post.

Saw cut a slot into the rear edge of the fuselage approximately 2 mm from the bottom (for locating the created rudder horn assembly).

Drill a hole of 0.5 mm diameter into each of the three cut outs in the leading edge of the rudder.

Insert three short lengths of 0.5 mm brass rod (e.g. ‘Albion Alloys’ MBR05) or similar).

Secure the rods in position with CA adhesive.

Position the rudder against the fin and mark the location of the three rods on the fin trailing edge.

Drill three corresponding holes into the trailing edge of the fin.

Test fit the rudder fin into the fin. Make sure the rudder is vertical.

At the bottom forward corner of the rudder, drill a hole of 0.8 mm diameter and vertically up the leading edge.

Insert a cut length of 0.8 mm brass rod (e.g. ’Albion Alloys’ MBR08) or similar.

Test assemble the tail plane with fin onto the fuselage support fairing, then add the rudder to the fin. Adjust the length of the inserted 0.8 mm rod until it is below the bottom of the rear fuselage edge.

Bend the bottom end of the rod towards the bottom of the fuselage.

Slide on the created rudder control horn and ensure it is able to fit partly into the cut slot in the rear edge of the fuselage.

Disassemble the parts and secure the 0.8 mm rod into the rudder using CA adhesive.

Drill a hole of 0.5 mm diameter into each of the three cut outs in the leading edge of each elevator half.

Insert short lengths of 0.5 mm brass rod (e.g. ‘Albion Alloys’ MBR05) or similar into the six holes.

Secure the rods in position with CA adhesive.

Position the elevator halves against the tail plane and mark the location of the rods on the fin trailing edge.

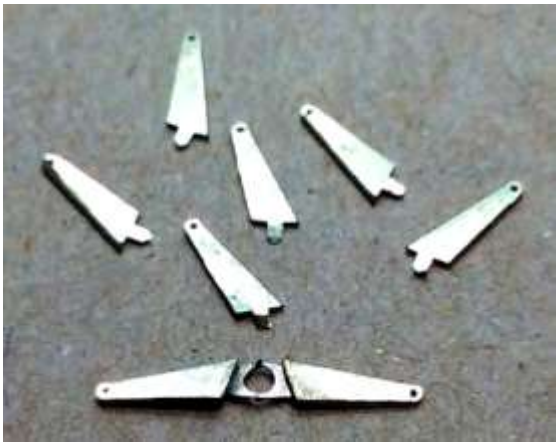
Drill three corresponding holes into the trailing edge of the each elevator half.

Test fit the elevator halves onto the tail plane and adjust by carefully bending, to achieve desired ‘droop’ angle for the combined elevator.

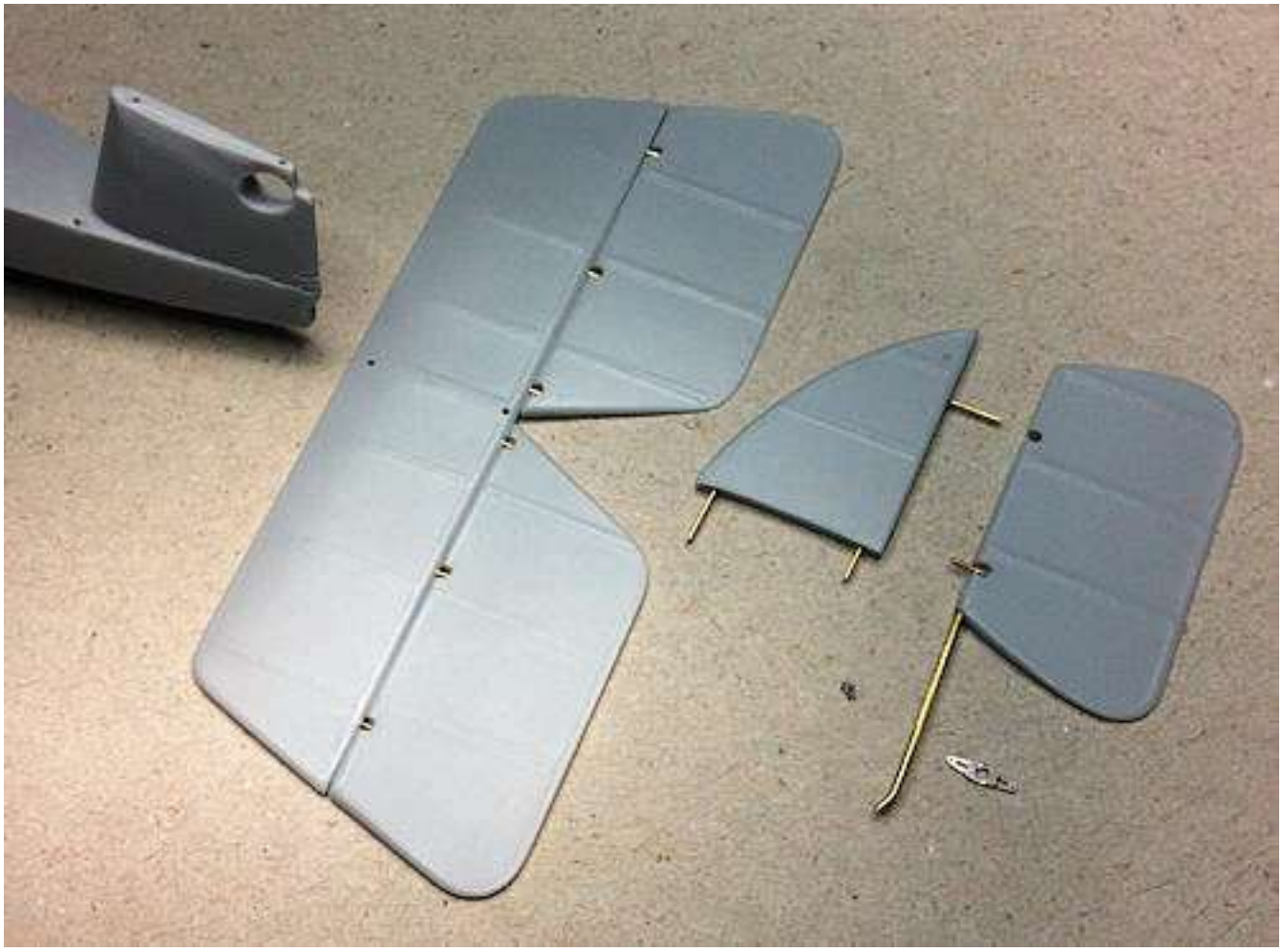
NOTE: *The location of the rudder control horns, as shown on the kit instructions, is incorrect as the rudder control horns should be located on the rudder post, at the rear of the fuselage.*

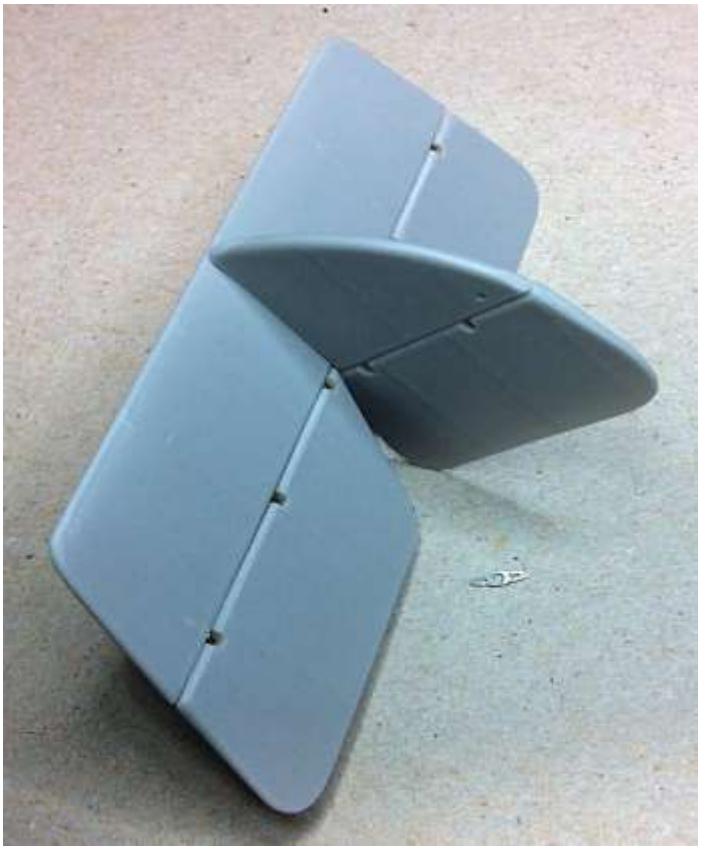
The kit horns for the rudder, ailerons and elevator were bent to shape and the rigging hole in the ends cleared using a 0.3 mm diameter drill.

To create the double ended rudder control horn I used a spare ‘Sopwith Pup’ photo-etch part as the centre hub, with two of the kit horns. Two horns were then secured to the centre hub using CA adhesive.

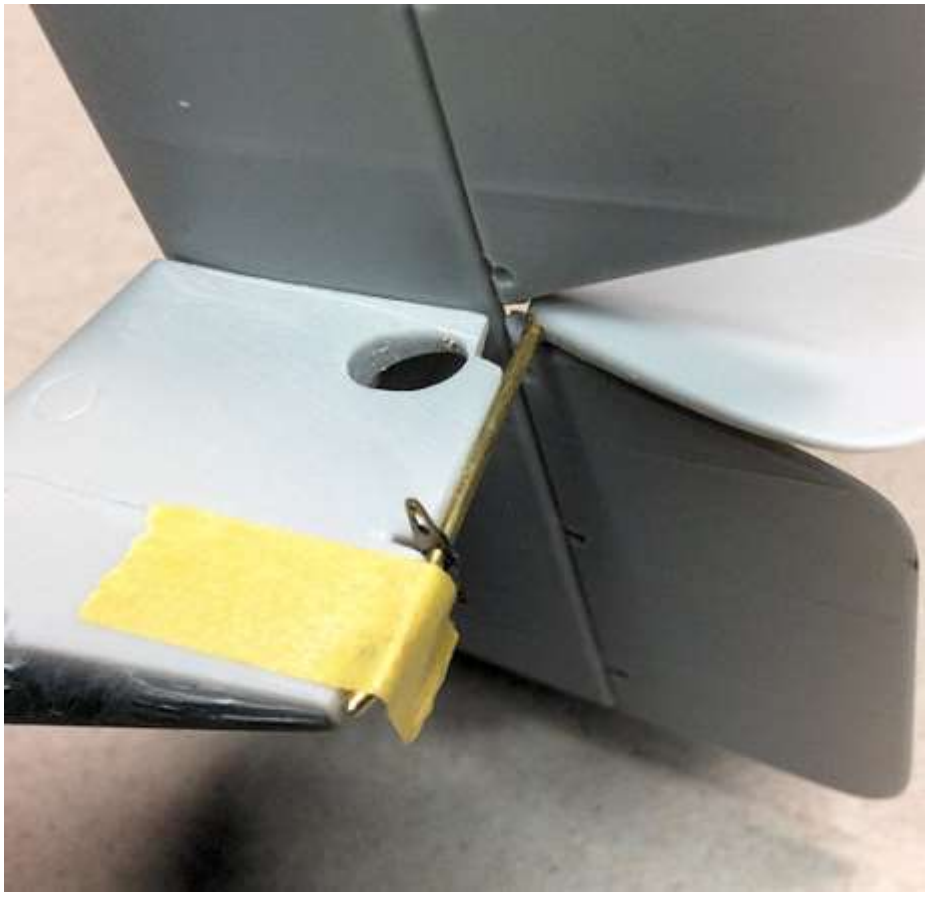


Rudder control horn (centre hub only shown).





Rudder control horn (centre hub only shown).



NOTE: *The following step provides for the elevator control rods, which will be fitted later in the build.*

Using a 0.8 mm diameter drill, carefully drill at a slight angle, into the inner surfaces of the open aperture in the fuselage support fairing. Drill around the inside and from both sides of the fairing. Then using a suitable scraper or similar, carefully remove the resin between the drill holes to create a 'hollow' inside to the fairing.

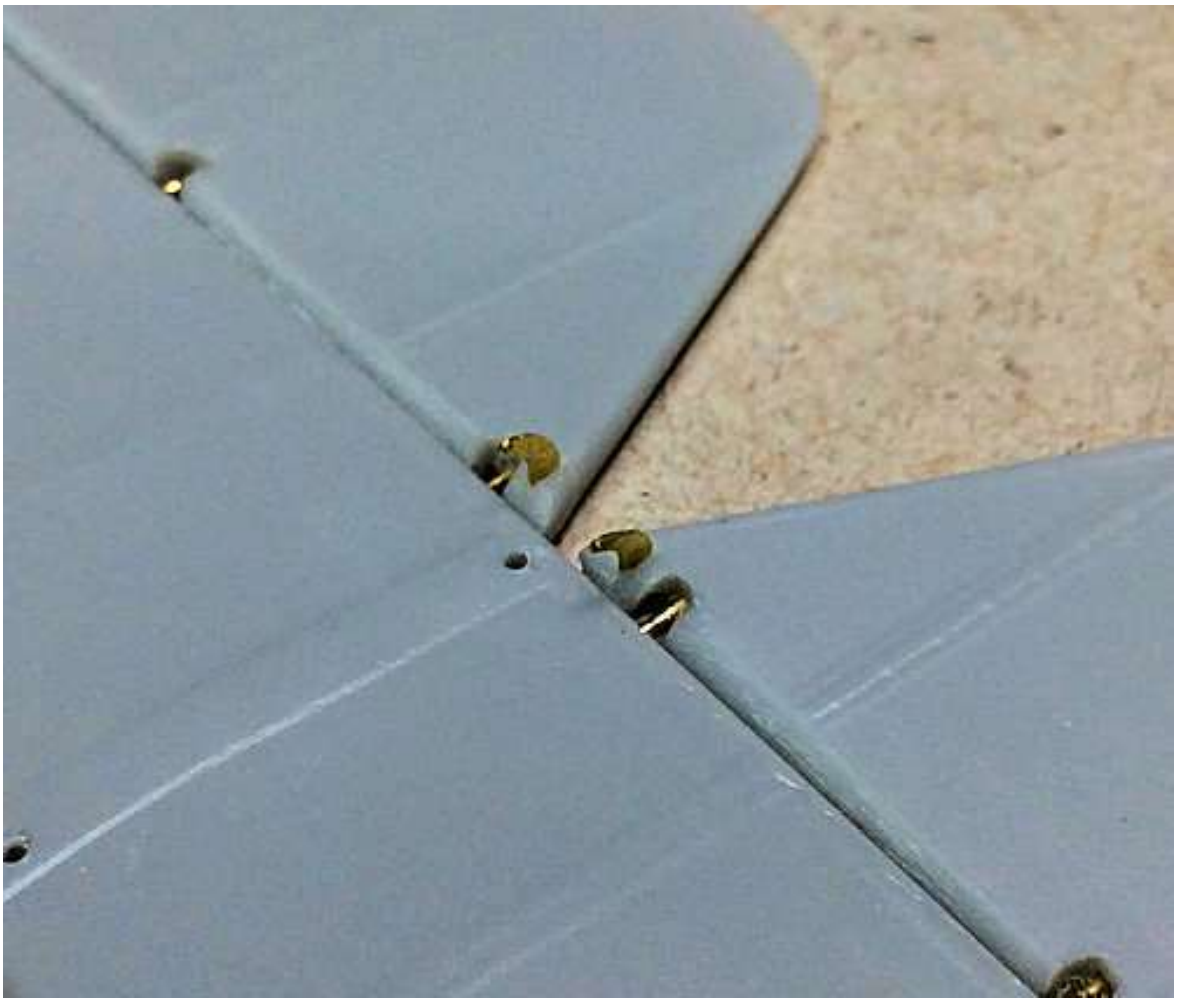
NOTE: *The kit supplied photo-etch control horns are over scale, so instead appropriate control horns from the 'Part' WWI control horns and turnbuckles set (S48087) will be used.*

Remove two 'curved' control horns from the 'Part' photo-etch set.

Drill a 0.6 mm diameter hole into the underside of each elevator half, close to the inboard edge.

Use a sharp chisel or similar to create shallow groove across the drilled holes (to seat the control horns in).

Test fit the horns but do not secure in position. This will be done later in the build.



Ailerons:

File or sand the leading edge of both of the ailerons to form a rounded profile.

Drill a hole of 0.9 mm diameter into each of the three cut outs in the leading edge of each aileron.

Insert lengths of 0.8 mm brass rod (e.g. 'Albion Alloys' MBR08) or similar into the six holes.

Secure the rods in position with CA adhesive.

Position the ailerons against their cut outs in the trailing edge of the upper wing and mark the location of the rods on the wing trailing edge.

Drill three corresponding holes into the trailing edge of each wing aileron cut out.

Test fit the ailerons into the upper wing and adjust by carefully bending, to achieve the desired angle for the ailerons (one up/one down).

Cockpit area:

Using a small drill, chain drill around the inside edge of the pre-moulded cockpit opening.

Carefully cut away the resin from the cockpit opening.

File, sand or scrape away the excess resin from around the cockpit opening.

NOTE: *My assumption is that the two ports in the decking were covered 'windows' to allow light in to illuminate the cockpit. These will have the covering fitted later in the build.*

Cut out the two ports pre-moulded into the decking panel, forward from the cockpit.

Using a curved scalpel blade or similar, remove resin from the inside surfaces of the cockpit forward decking and the two open ports, to reduce the thickness of the decking.

Wing attachments:

The upper and lower wings are solid mouldings. The instruction manual shows that the lower wings need to be attached and supported at the fuselage by metal pins. Similarly the two halves of the upper wings also need to be pinned together.

NOTE: *Although the instructions show lower wings require only one attachment/support pin, the wings need to support the weight of the large upper wing. Therefore I decided to add an extra support pin to each wing.*

The wing roots of the lower wing halves have a pre-moulded indent. Using these as guides, drill a hole, as far as possible, of 1.0 mm diameter into each wing root.

The fuselage top edge on each side have a pre-moulded indent between the two engine support strut locations. Using these as guides, drill a hole, as far as possible, of 1.0 mm diameter into each wing root.

Cut a length of 1.0 mm diameter brass rod such that it can be inserted fully into the holes drilled both the wing root and fuselage and with the wing contacting the fuselage side.

Secure the rod into the hole in the wing root, using CA adhesive.

Centre point mark the inner edge of the wing roots 8 mm forward from the centre of the inserted pin and central.

As before, drill holes of 1.0 mm diameter as far as possible into the wing roots and secure 1.0 mm diameter brass rods into these holes.

Carefully position the rear rods against the fuselage and aligned with the pre-drilled hole.

Mark the position of the forward rod onto the fuselage.

Drill a hole of 1.0 mm diameter into the fuselage, as before, but with the centre of the hole 2.0 mm from the top edge of the fuselage.

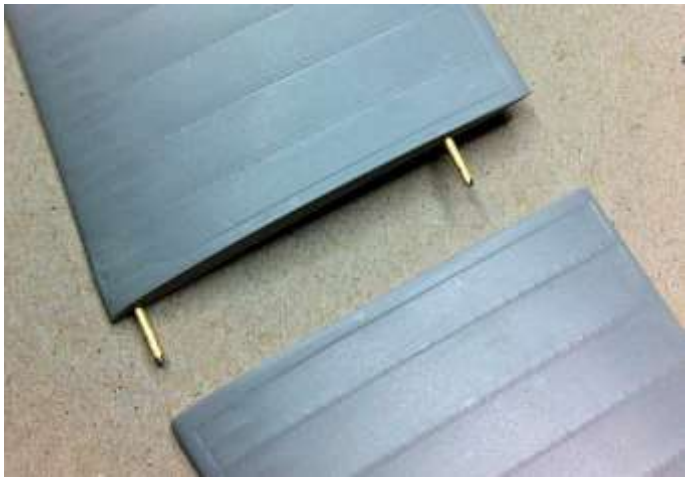
Insert the wings into their location holes and if necessary, slightly bend the wings upwards to achieve the required 3 degrees of dihedral angle.

NOTE: *You may find you have to sand away the rear edge of the wing root in order to clear the shroud of the engine rear support strut.*

The wing roots of the upper wing halves have two pre-moulded indents. Using these as guides, drill holes, as far as possible, of 1.0 mm diameter into each wing root.

Cut two lengths of 1.0 mm diameter brass rod such that they can be inserted fully into the holes drilled one root and with the two wing halves fully contacting when joined.

Secure the two rods into the holes in one wing root, using CA adhesive.



Engine bearer strut attachments:

The two ‘Z’ strut engine bearers are fitted into the fuselage by inserting the protruding steel pins in the struts into holes drilled in the top edge of the fuselage at the struts locations. These have pre-moulded indents as drill guides.

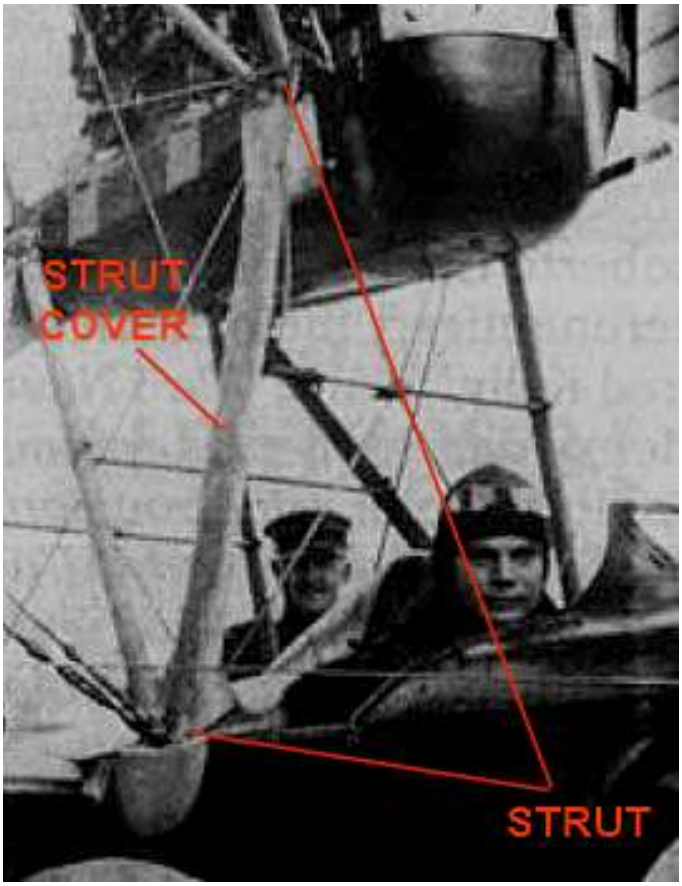
NOTE 1: *When fitted the two ’Z’ struts should be at approximately 90º to the fuselage. However I found that the bottom of the forward struts contact the top of the curved fuselage decking panel, stopping the struts from sitting at the correct angle. This required those fuselage locations to be channelled out and the inboard edge of the struts to be slightly chamfered.*

NOTE 2: *The engine controls, fuel and oil lines were routed from the fuselage to the engine up the right, forward engine bearer strut, which appears to be fitted with a protective cover, so in the kit this strut is moulded wider than the strut on the opposite side. However the intention is to show the engine controls, fuel and oil pipes exposed on the strut.* ***Therefore this strut was reduced in size to match the opposite side.***

At the four struts location indents in the fuselage, drill a hole of 0.8 mm diameter vertically down into the fuselage sides.

Slightly chamfer the inboard edge of the forward struts.

Using a sharp modellers chisel or similar, create a recess in the fuselage at the forward strut locations, sufficient to allow the strut to be fully seated and at approximately 90º to the fuselage.



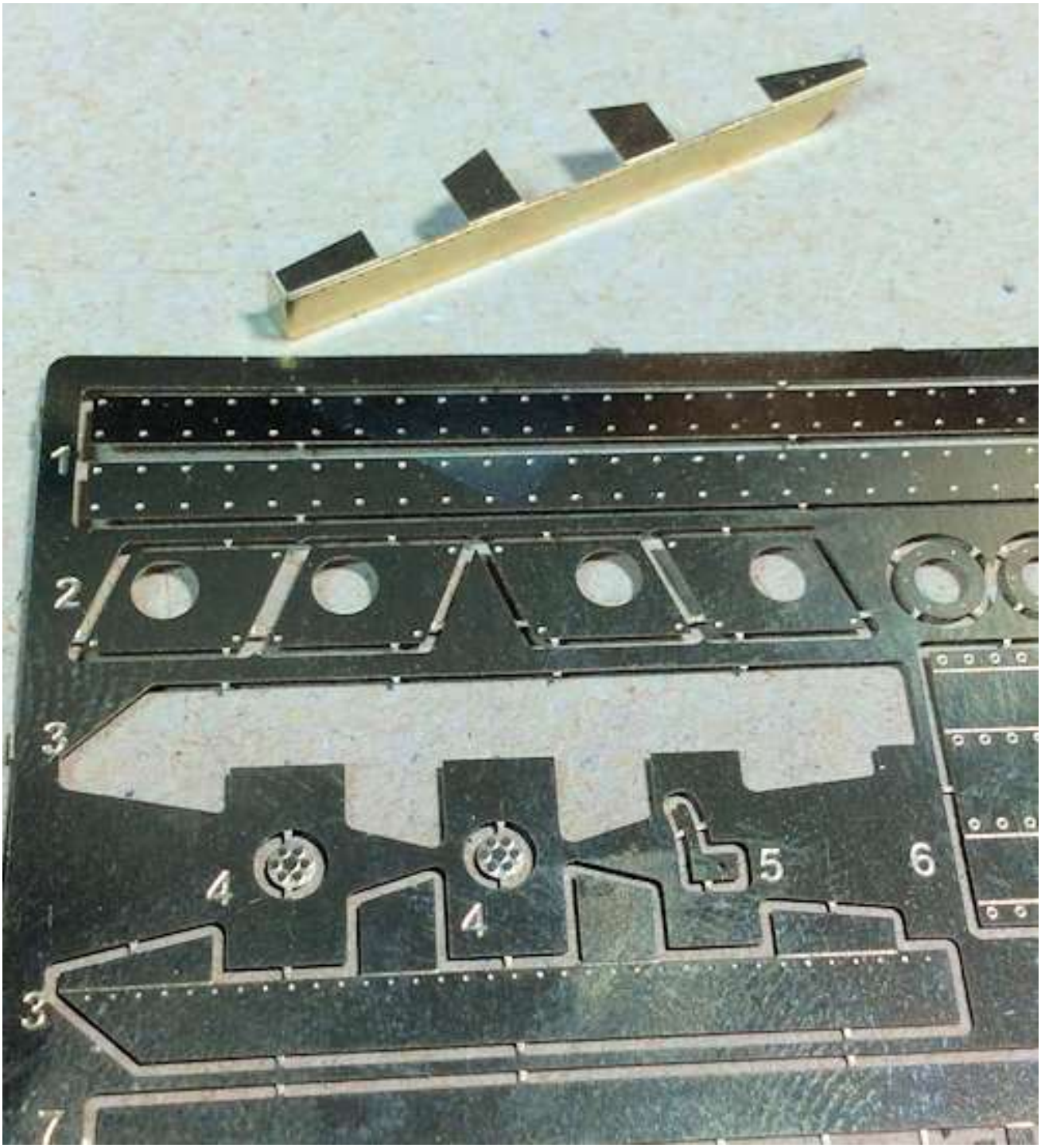
WARNING: ***Refer to page 216 of this build log - due to problems with the kit supplied upper 'Z' struts that attach the to the end plates of the photo-etch engine bearers, holes need to be drilled through the end plates. This is best done before the photo-etch is bent and attached to the lower 'Z' struts.***

NOTE: *Rigging from the lower wing is connected to the tops of the 'Z' engine bearer support struts. Before the location for the rigging anchors can be created, some detail work can be added to the struts, including the addition of photo-etch parts.*

Remove parts 3 from the kit supplied photo-etch sheet.

Remove any tags from the edges of the parts.

Bend the parts, along the score lines, lengthwise and at 90º at non-angled end to form the engine bearer support plates.



NOTE: *To make sure the photo-etch plates are fitted to the correct side of the struts, temporarily fit the struts into their locations in the fuselage.*

Using CA adhesive, secure the plates to the tops of the engine bearer ‘Z’ struts, making sure the 90º end fits against the rear end of the bearers.

Remove any ‘overhang’ of photo-etch along the lower edge of the bearer top strut, so that the edges are flush.

At this stage minor details can be added to enhance the look of the struts:

Using CA adhesive, fit two ‘RB Motion’ Aluminium Nuts Hex 0.79mm (1281-A) diagonally across to two central side plates of each photo-etch bearer plates.

Drill a hole of 1.0 mm diameter through the top resin struts, centrally at the three exposed resin areas.

Using a 0.4 mm diameter drill, ’clean out’ the pre-moulded panel fasteners on the bottom and top cowl panels (8 and 15).

Wing support strut attachments:

The upper wing is supported on the fuselage and lower wing by a ‘V’ strut at each side between the two wings and by a ‘Z’ strut at each side, from the engine bearer assembly. Each of the strut locations on the underside of the upper wing have indents as drill guides.

NOTE: *When drilling strut locations into the wing, make sure you do not drilled completely through the wing.*

Upper wing:

At the indent guides on the wing for the wings ‘V’ struts (middle pair of indents) drill holes of 0.8 mm diameter into the wing.

Test fit the wing ‘V’ struts and cut the reinforcing steel pins to obtain a good fit against the wing.

At the indent guides on the wing for the engine bearer ‘Z’ struts (inboard pair of indents) drill holes of 0.8 mm diameter into the wing, following the angle of the strut pins.

Test fit the wing ‘Z’ struts and cut the reinforcing steel pins to obtain a good fit against the wing.

On the underside of the wing, just outboard of the ‘V’ strut locating holes, drill two holes of 0.5 mm diameter for locating the outer bracing struts.

Lower wings:

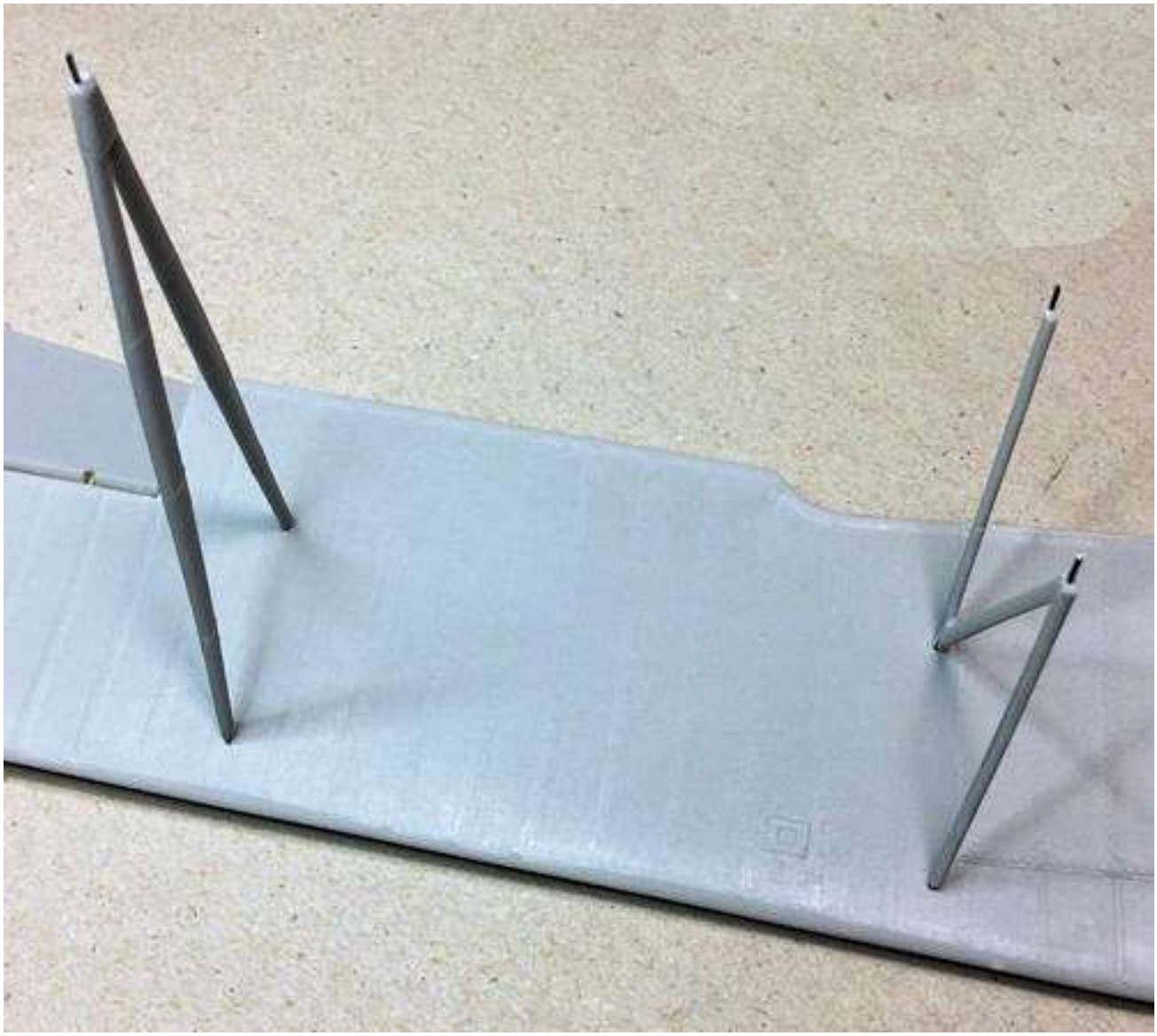
In the centre of the dome on the upper surface of the lower wings, drill a hole of 0.7 mm diameter (lower mounting for the wing ‘V’ struts).

Temporarily locate the wing ‘V’ struts into their drilled location holes in the underside of the upper wing.

At the indent guides on the underside of the upper wing for the wings bracing struts (outer pair of indents) drill holes of 0.6 mm diameter into the wing and at the angle to align with the bottom of the ‘V’ strut.

On the upper surface of each of the lower wings is the domed location for the struts. On the outer edge of the dome, drill two holes of 0.5 mm diameter for locating the outer bracing struts.

At the bottom edge at the rear of the fuselage are indents for locating the tail plane support struts. At each side drill holes of 0.6 mm diameter into the fuselage



Rigging location points:
There are various locations around the model for control wires, airframe rigging wires and cross brace wires. Before the model assembly starts, it's best to drill these locations whilst access is still available.

NOTE: *Refer to Part 5 of this build log for information.*

Cockpit:
The flight control rigging in the cockpit is as follows:

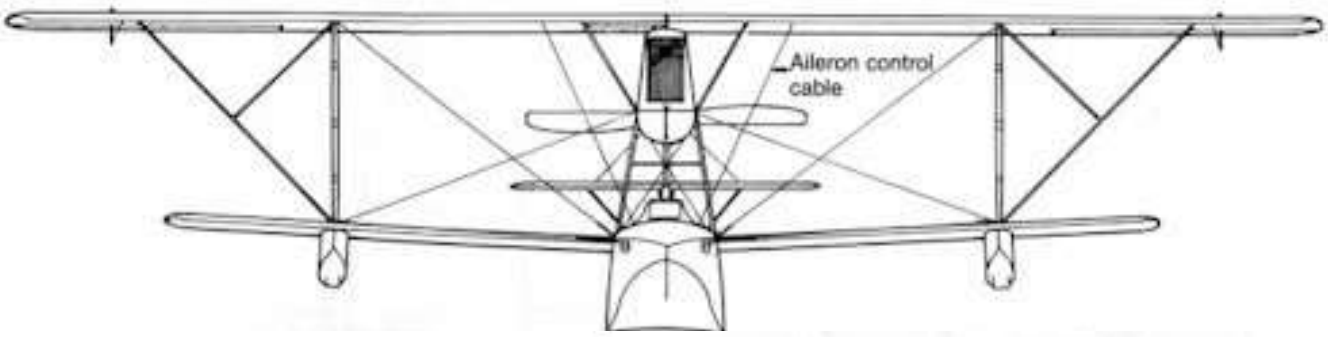
Rudder bar - rudder control cables
Control column - elevator cables
Torque bar - aileron cables

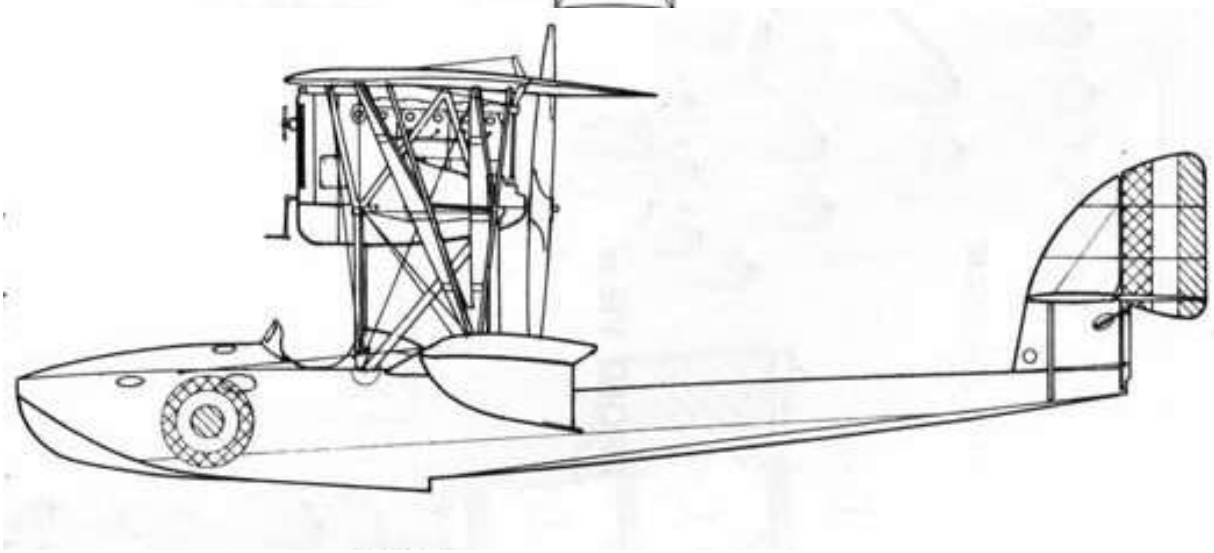
Due to how fragile the cockpit parts are and that they are resin, not styrene, it's not practicable to drill holes through the parts to rig the control lines. Instead the control lines will be created later in the build, using 'EZ' elastic line secured directly around the parts.

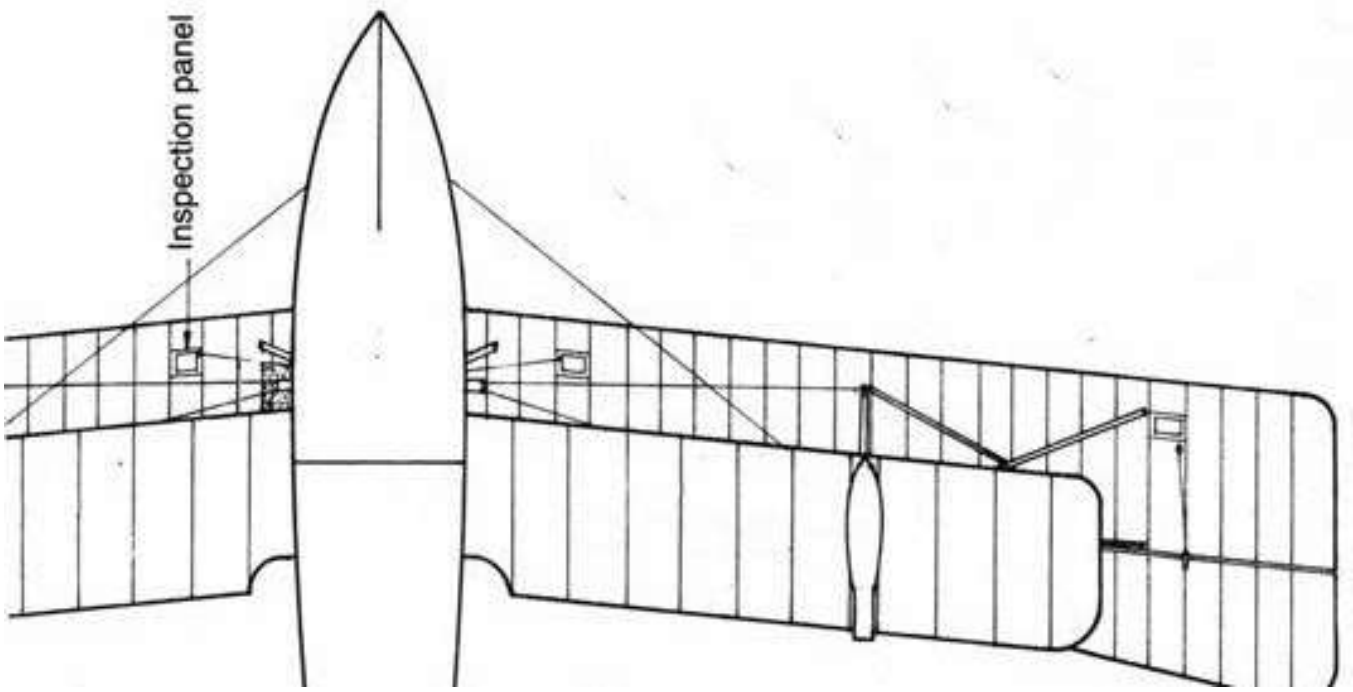
Airframe:
The airframe rigging in the cockpit is as follows:

Aileron cables from cockpit to upper wing
Aileron control horns to upper wing
Bottom of wing 'V' struts to the top of the two engine bearer 'Z' struts (created later in this build)
Bottom of forward engine bearer 'Z' strut to tops of wing 'V' struts
Lower wing 'V' strut base to forward fuselage
Elevator control from fuselage support fairing (to be created later in the build).

Generally the anchors or turnbuckles used for airframe rigging will be from the 'Gaspatch' 1:48th scale turnbuckle range. These **require a hole of 0.3 mm diameter** to be drilled to insert the shank of the turnbuckle or anchor.



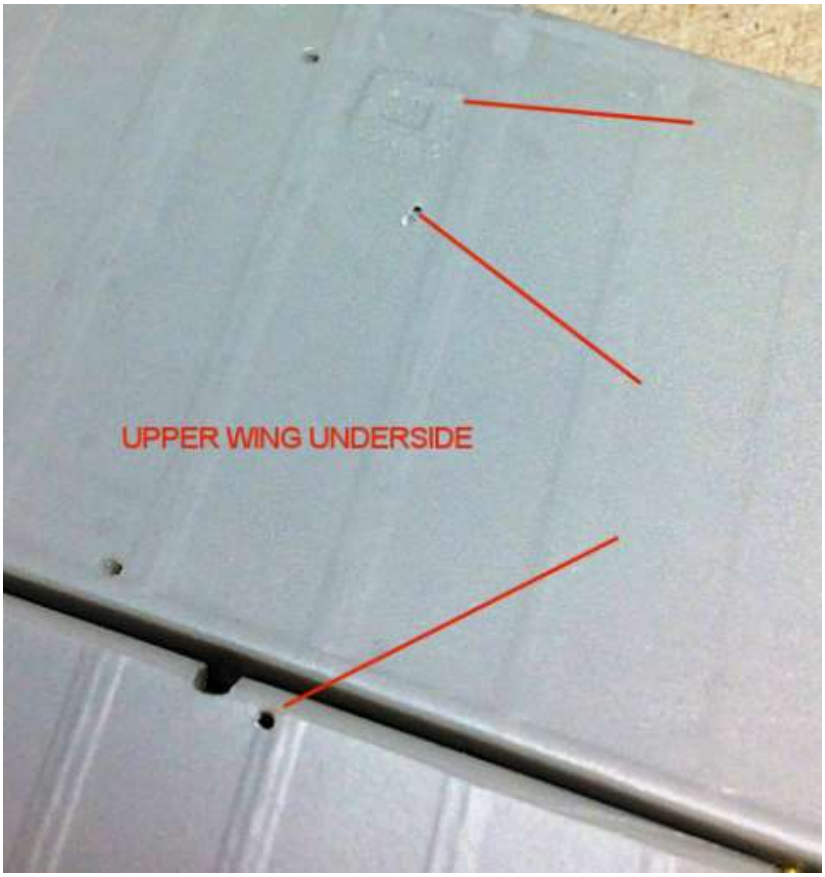




Aileron control horns to upper wing:

On the upper wing, at the pre-moulded indents on the upper and undersides forward from the aileron cut-outs, drill holes into the wing and angled slightly back and up towards where the aileron control horns will be located.

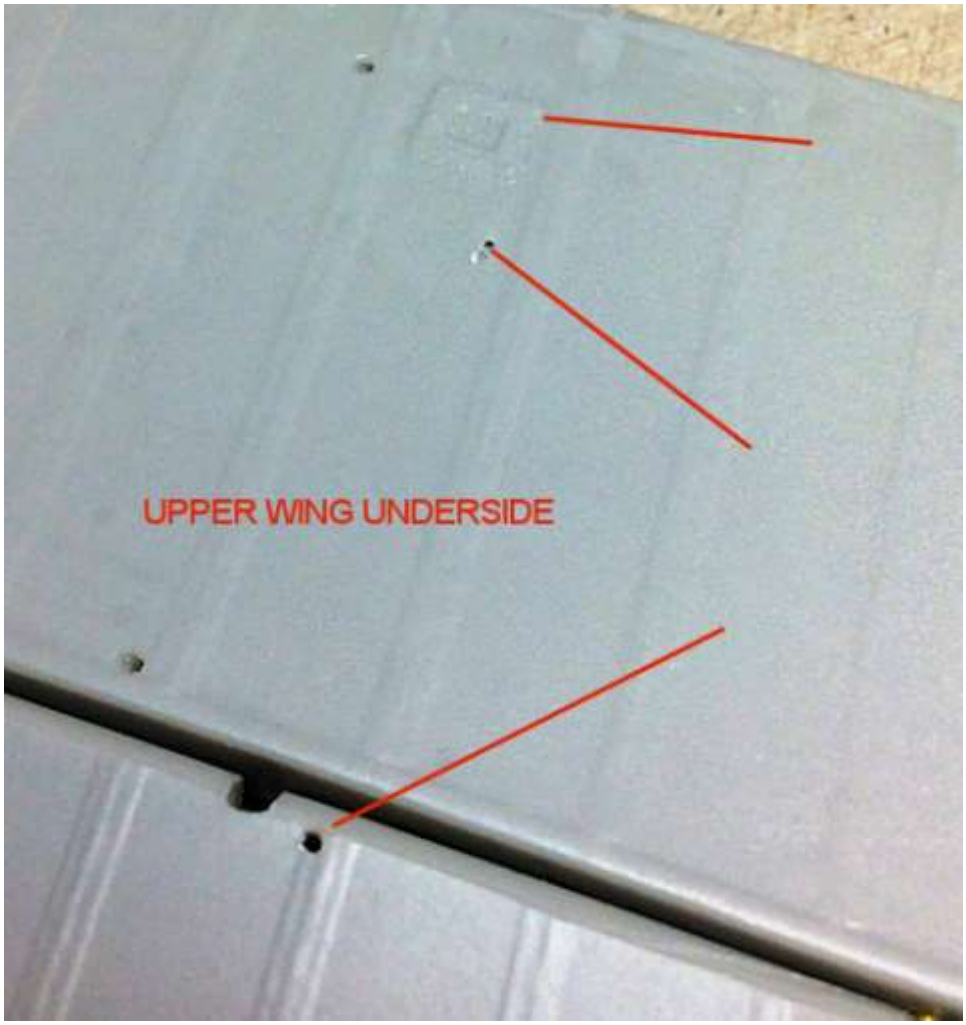
On the aileron leading edges, inline with the drilled holes and just back from the edge, drill a hole of 0.6 mm diameter through the aileron (for locating the control horns later in the build).



Aileron cables from cockpit to upper wing:

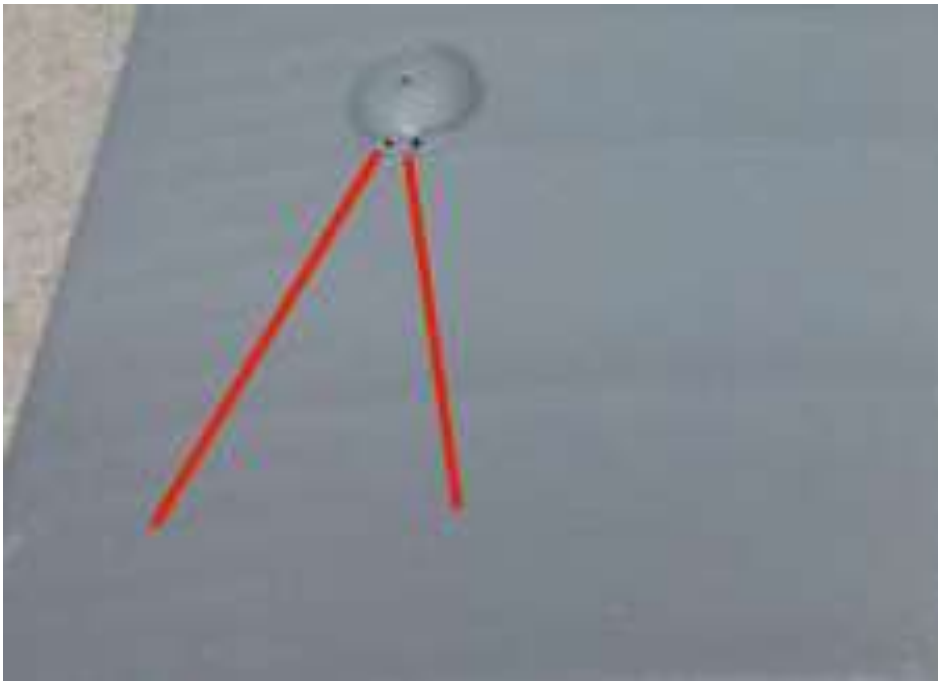
At each side of the decking panel behind the cockpit, drill a hole into the fuselage at a slight outward direction. Make sure the holes penetrate into the cockpit.

Drill holes into the underside of the upper wing, at the inboard inspection windows on each side.



On the upper surface of each of the lower wings is the domed location for the struts.

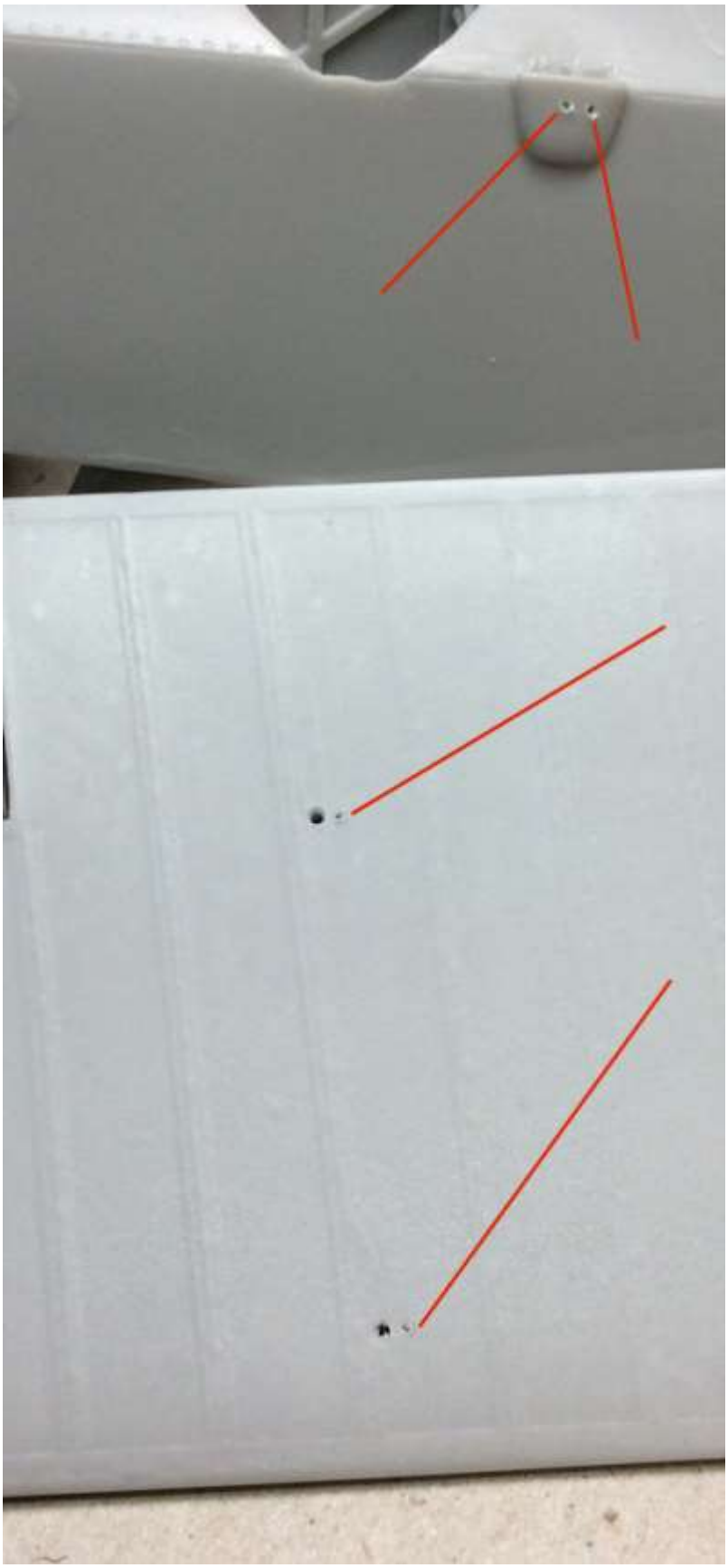
On the inboard edge of the dome, drill two rigging holes close together at the centre of the dome. The holes should be drilled at an upward angle of approximately 30º and towards where the top of the engine bearer struts will be located.



Bottom of forward engine bearer ‘Z’ strut to tops of wing ‘V’ struts:

At each side of the fuselage, drill two rigging holes into the forward strut cover for the engine bearer ‘Z’ struts.

Drill a rigging hole into the underside of the upper wing, inboard from the two wing ‘V’ strut locations.



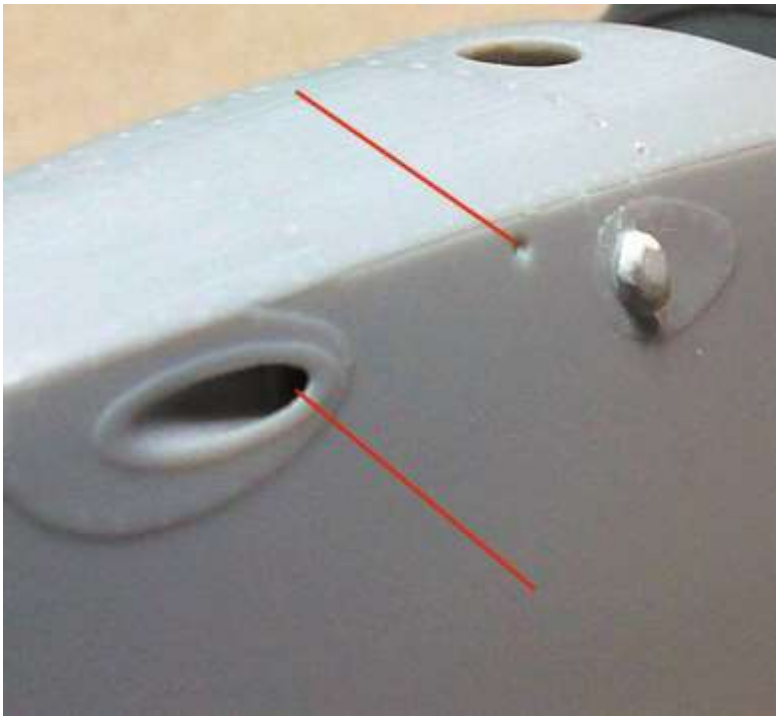
Lower wing leading edge to forward fuselage:

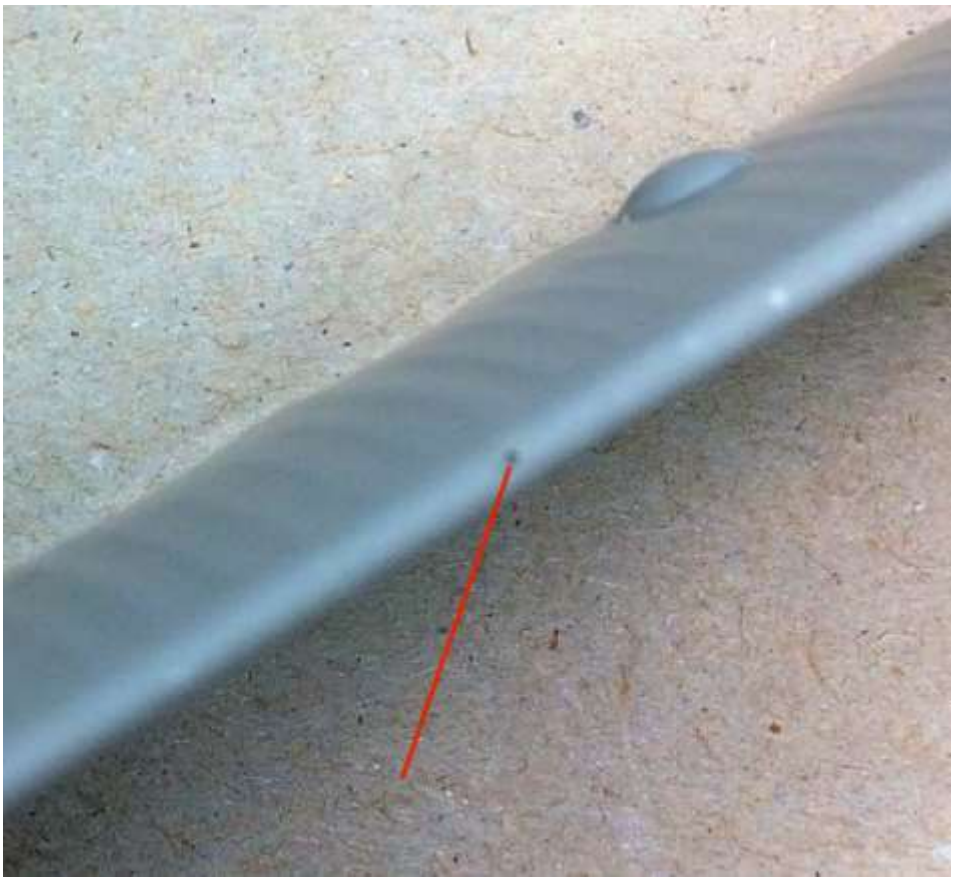
At each side of the aircraft, a bracing wire was connected between the leading edge of the lower wing and the top edge, forward fuselage.

A pre-moulded indent is located on the top, forward edge of each side of the fuselage, between the gun ports and side rigging ‘ears’. At each indent, drill a rigging hole.

On the leading edge of each lower wing, at the sixth rib tape in from the wing tip, drill a rigging hole, angled out and towards the nose of the aircraft.

At this stage you can drill out the two gun ports up to 1.5 mm diameter.





Cross bracing:

NOTE: *The engine bearer 'Z' struts are braced with rods, horizontally between the front and rear struts and between the diagonal struts. The will be made from brass rod later in the build.*

The cross bracing rigging at the engine bearer struts is as follows:

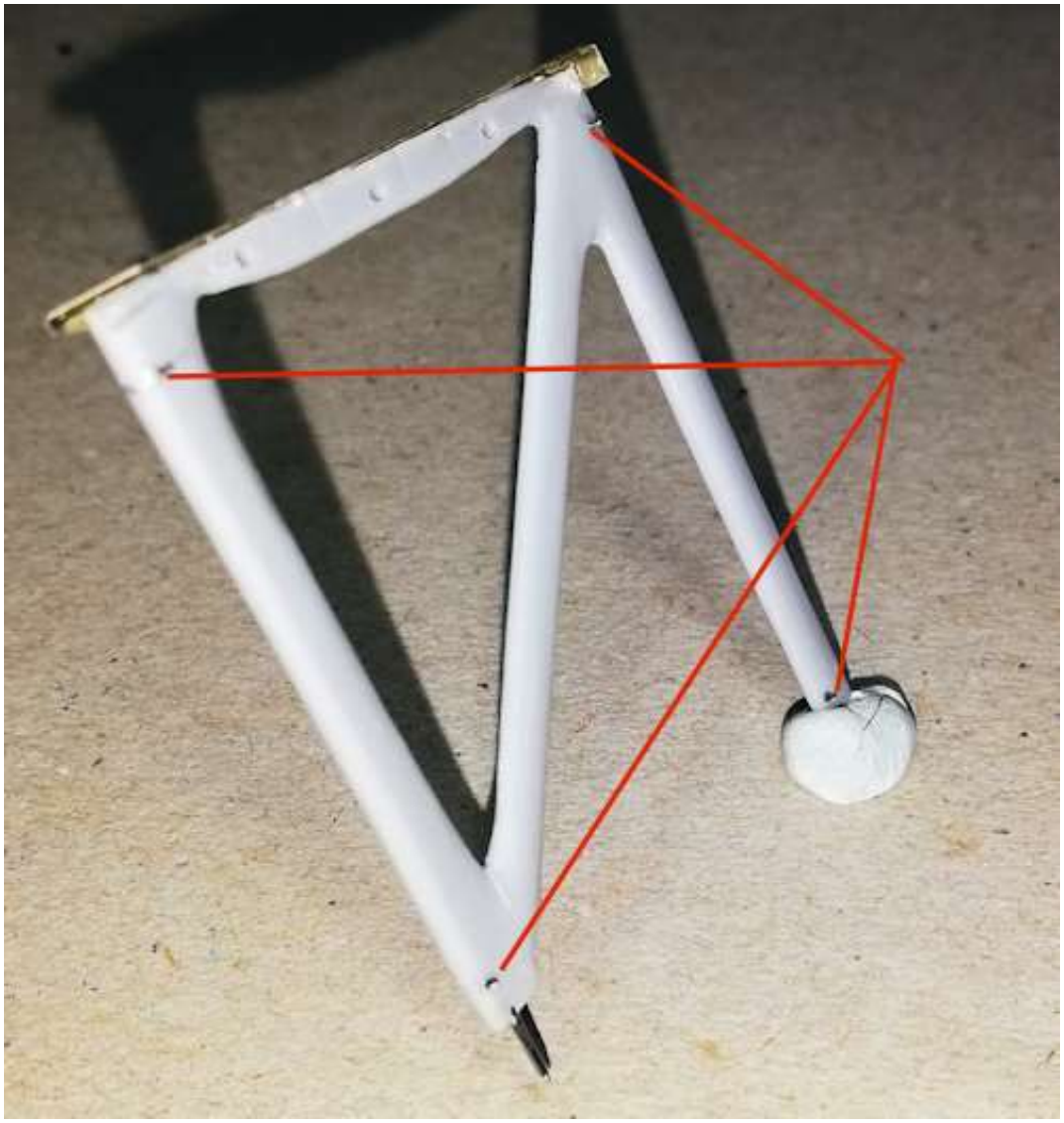
Cross wires between engine bearer forward support struts
Cross wires between engine bearer rear support struts
Cross wires between engine bearer forward and rear support struts

NOTE: *The three bracing cross bars can't be created until the engine and its bearer assembly is complete later in this build, as the bars need to intersect where the forward and rear bracing wires cross.*

On the inside face of the front and rear engine bearer 'Z' struts, drill a hole through the struts approximately 5 mm from the top and bottom.

Using CA adhesive and from the inside of the struts, secure into the drilled holes a 'Gaspatch' 1:48th scale 'anchor'.

Once fully set, file away any protruding anchor stems from the outside of the struts.

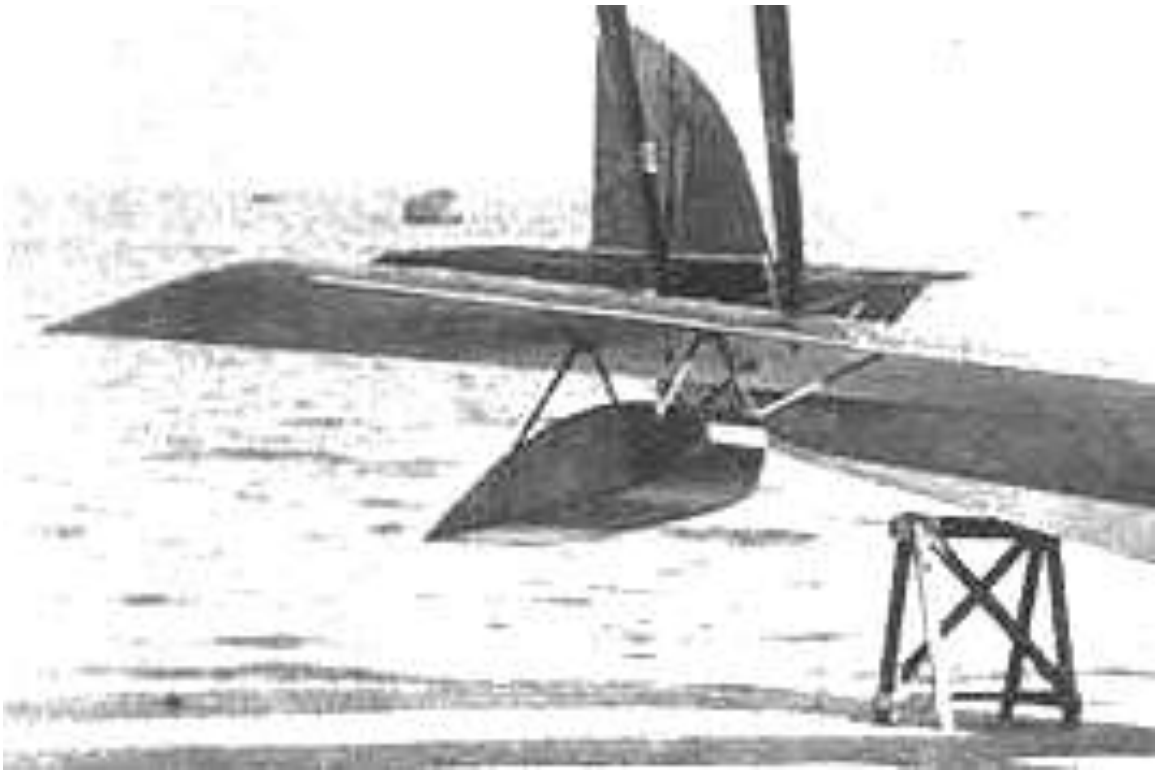


Wing floats:

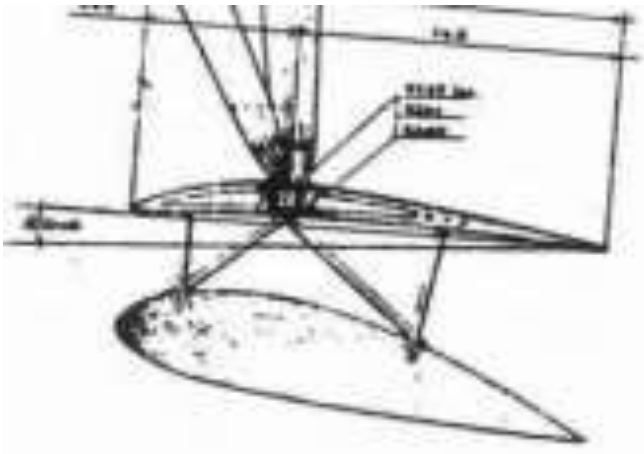
The two floats for the underside of the lower wings are supplied as two different versions. The fully flared version floats (part 45 and 46) fit directly to the wings. However this type of float was soon discarded and the more tradition ‘suspended’ floats were used instead. These are supplied in the kit but not shown on the parts call outs. Although the resin floats are supplied, the support struts are not and will need to be created. Also the supplied floats are not long enough and have no tapering at the front.

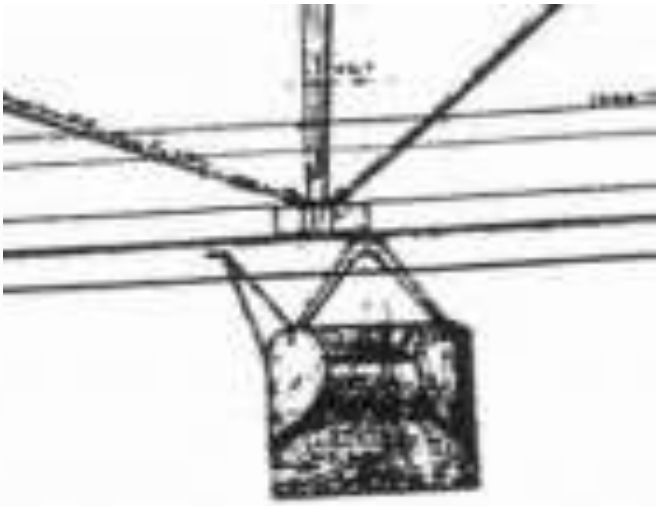
There appears to have been two versions of support struts employed.

Version 1: As can be seen from the following photograph, the two struts from the inboard side of the float are parallel and are connected separately to the underside of the lower wing.



Version 2: As can be seen from the following illustrations, the two struts from the inboard side of the float merge where they connect to the underside of the lower wing.





NOTE 1: *For this build I chose Version 2 with merging struts.*

NOTE 2: *Refer to the previous illustrations for strut details.*

Drill holes of 0.8 mm diameter into the top of the floats for fitting the struts. For each float - two holes across the forward top and two at the top rear. These holes should be angles inwards. Also two holes adjacent to the drilled holes and on the top, inboard edge of each float. Those holes should be angled towards the fuselage and towards each other. Make sure the holes for the side 'V' struts are drilled on the correct side for the left and right floats.

Using 0.7 mm diameter brass tube (e.g. 'Albion Alloys' MBT07) or similar, create two 'V' struts and one side 'V' strut. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

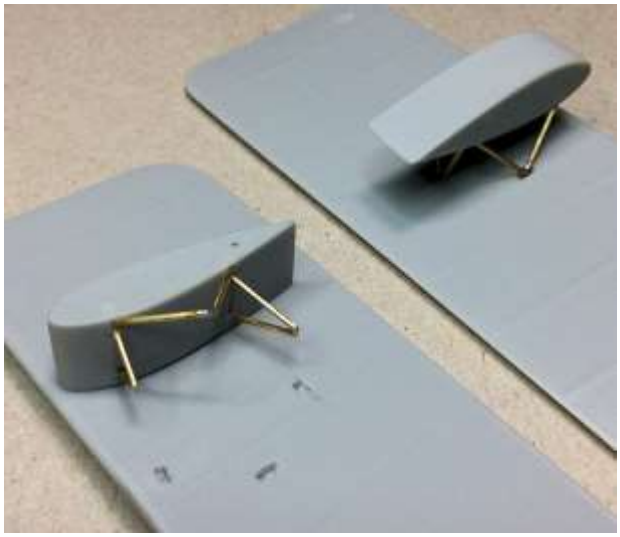
Secure the struts into each float using CA adhesive.

Position each float assembly onto its lower wing underside, within the two close together rib tapes.

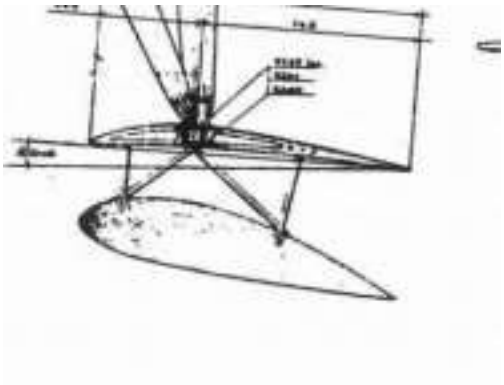
Mark the position of the three strut contact points.

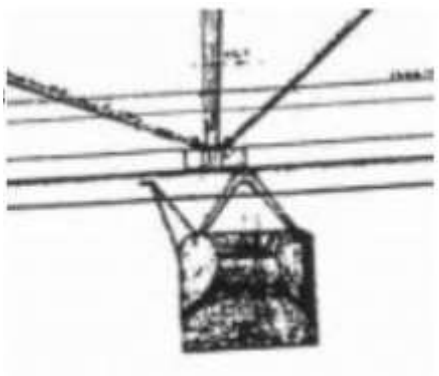
Using a 0.8 mm diameter drill initially, then a small modellers chisel or similar, create three rectangular indents in the underside of the lower wings.

Test fit the float assemblies and adjust the indents as necessary until the floats are seated at the correct angle and are parallel to the wing.



NOTE: *After modifying the floats, I became aware that the kit supplied floats were too short and did not have the front 'nose' tapered in from the sides as shown on the photograph and drawings below. Therefore the floats require further modification.*





Using a modelling saw, cut the sides of the floats at an angle to create the side taper towards the nose of the floats.

Sand the cut sides to achieve a smooth surface.

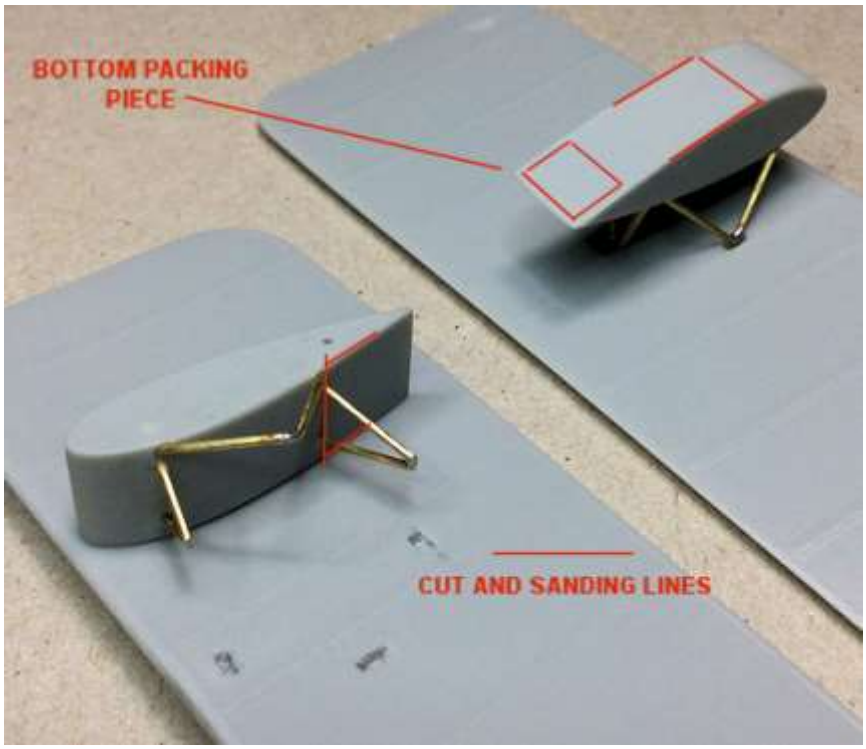
Using the modelling saw, make a horizontal cut approximately 0.6 mm deep across to top of the floats, behind the rear float support struts.

Using the modelling saw, make a horizontal cut approximately 0.6 mm deep across to bottom of the floats, behind the front float support struts.

Carefully scrape or file the floats at the rear of the cuts to the same depth as the cuts.

Cut two short strips of 0.5 mm thick plastic card, slightly less than the width of the floats.

Using CA adhesive, secure these strips to the rear of the bottom of the floats (as shape packing for the bottom ‘skin’).



Cut two strips of 0.5 mm thick plastic card, slightly wider than the floats and approximately 28 mm in length.

Using CA adhesive, secure the 28 mm long strips against the saw edge created on the bottom of the floats and onto the packing strip previously fitted.

Cut two strips of 0.5 mm thick plastic card, slightly wider than the floats and long enough to align with the rear edge of the previously fitted 28 mm strips and against the saw edge created on the top of the floats.

Using CA adhesive, secure the strips against the saw edge created on the top of the floats and onto the top of the rear edge of the previously fitted 28 mm strip.

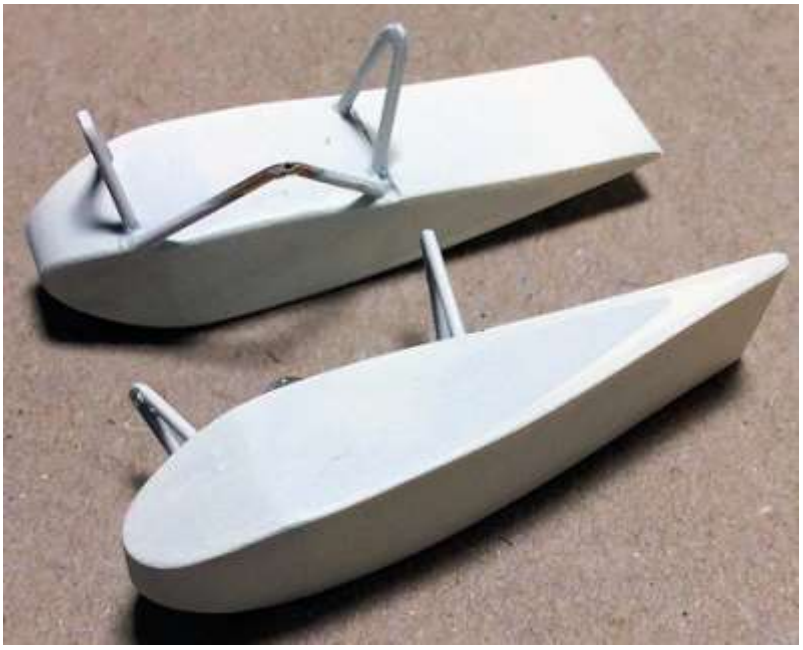
Carefully sand both sides of the floats to blend the edges of the fitted strips to the sides of the floats.

Sand the joined rear edges of the fitted strips to remove the glued seam.

Using a modelling putty (e.g. 'Perfect Plastic Putty' or similar) fill in the gaps along the sides of the floats.

Once set, sand the sides and bottom of the floats to blend the applied putty and fitted strips with the original resin floats.

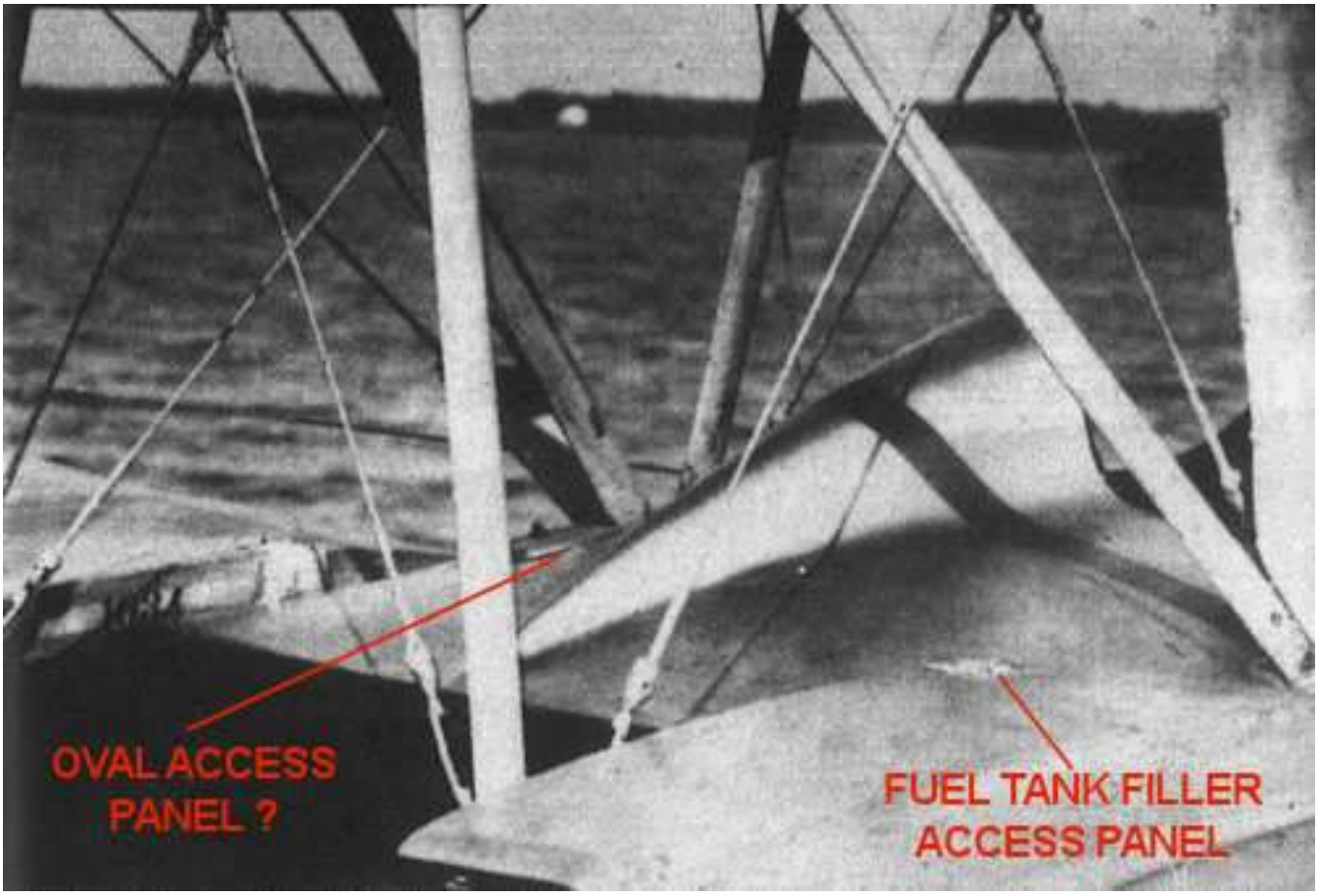
Airbrush prime the floats with a white primer (e.g. 'AK Interactive' White AK-759 or similar).

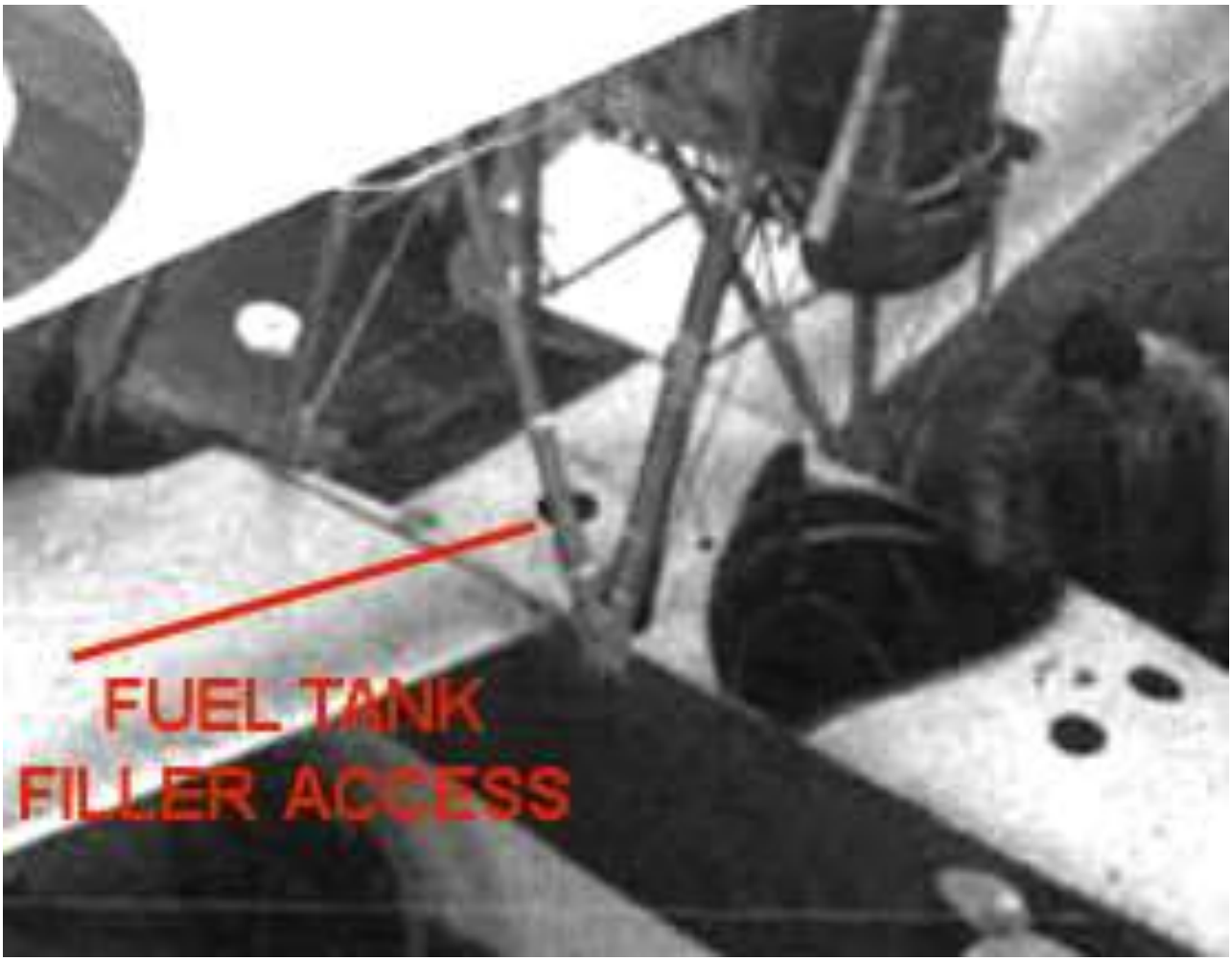


Fuel tank - filler cap:

The fuel tank was located in the fuselage, behind the cockpit bulkhead, to the rear of the pilot's seat. Access to the fuel filler cap for the tank appears to be through an aperture, located on the right side of the decking panel behind the cockpit, but this is not represented on the models fuselage. The photograph below show the aperture open, presumably for maintenance and with a cover fitted, which I assume was for normal operations. The cover plate appears to be 'dished' into the steel deking panel, rather than being a flat plate proud of the panel surface.

NOTE: *The model does have a large oval panel pre-moulded onto the left side of the rear decking panel. The only evidence found of this oval access panel is in the following photograph. Most photographic evidence or drawings seem to show that this panel was not fitted. Therefore I'm assuming this was the case on most Macchi M.5 aircraft, so chose to remove the panel.*


OVAL ACCESS
PANEL ?
FUEL TANK FILLER
ACCESS PANEL


FUEL TANK
FILLER ACCESS

NOTE: *To cut discs from plasticard I use a 'ThinnerLine' circle cutter. There is also a similar tool available from 'DSPIAE'.*

To represent the cover plate over the fuel filler aperture:

Cut a disc from 0.2 mm thick plasticard -5 mm diameter.

Position the 5 mm diameter disc onto the right side of the decking panel to the rear of the cockpit - centre 8 mm from the fuselage edge and 10 mm from the cockpit rear edge. Secure in position using CA adhesive.

Use an appropriately size drill to create a shallow indent through the centre of the disc and into the resin fuselage.

Use a small modellers chisel or similar to increase the diameter of the ‘dish’ shape into the disc.

Use a curved needle file or scalpel blade and carefully smooth out the ‘dish’ shape.

Using a pointed tool, make four equally spaced and shallow indents around the outer edge of the disc. These represent the fasteners for the cover plate.

Carefully scrape or sand away the pre-moulded oval access panel on the left side of the rear decking panel.

Airbrush prime the worked areas with a grey primer (e.g. ‘AK Interactive’ Grey AK-758). This will show any surface imperfections that need to be removed.

PART 8

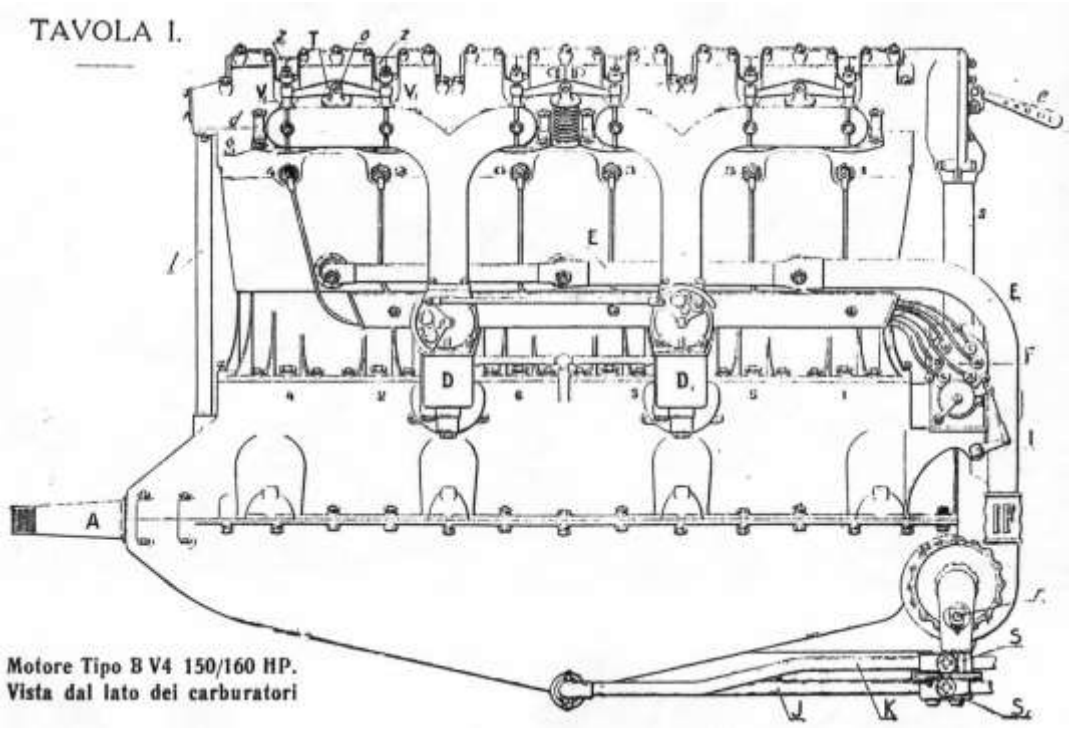
ENGINE WITH MODIFICATIONS

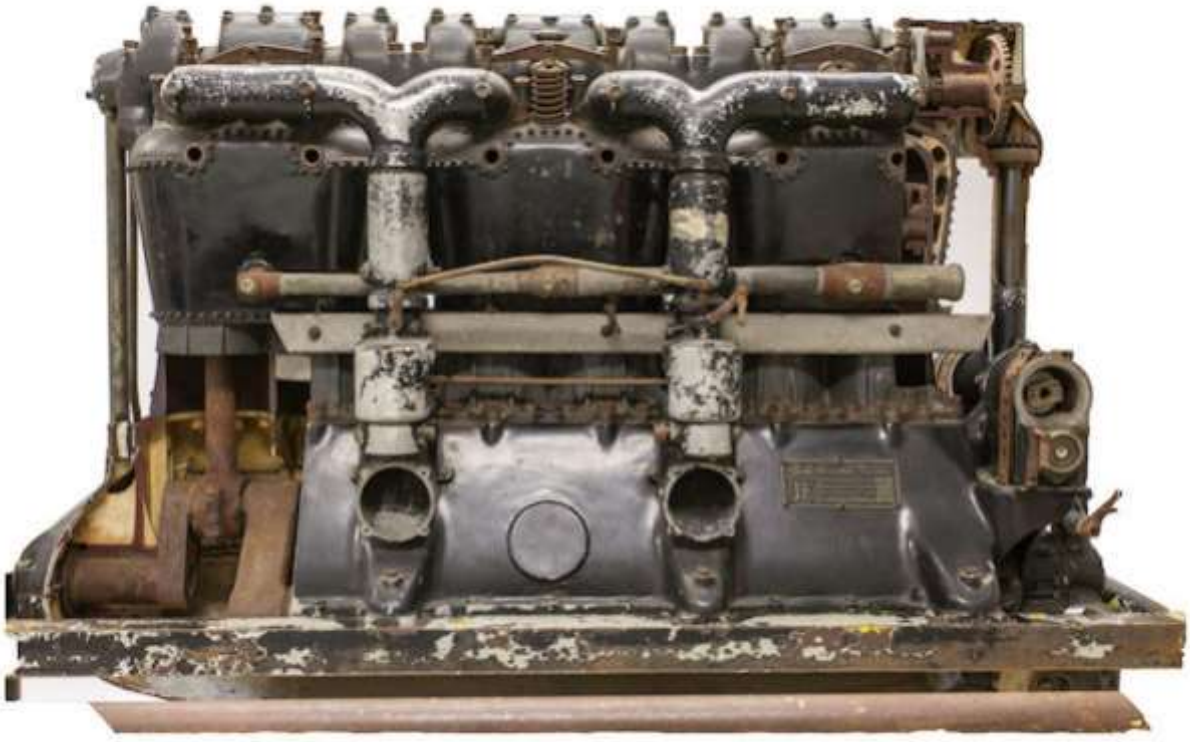
PART 8 - ENGINE WITH MODIFICATIONS

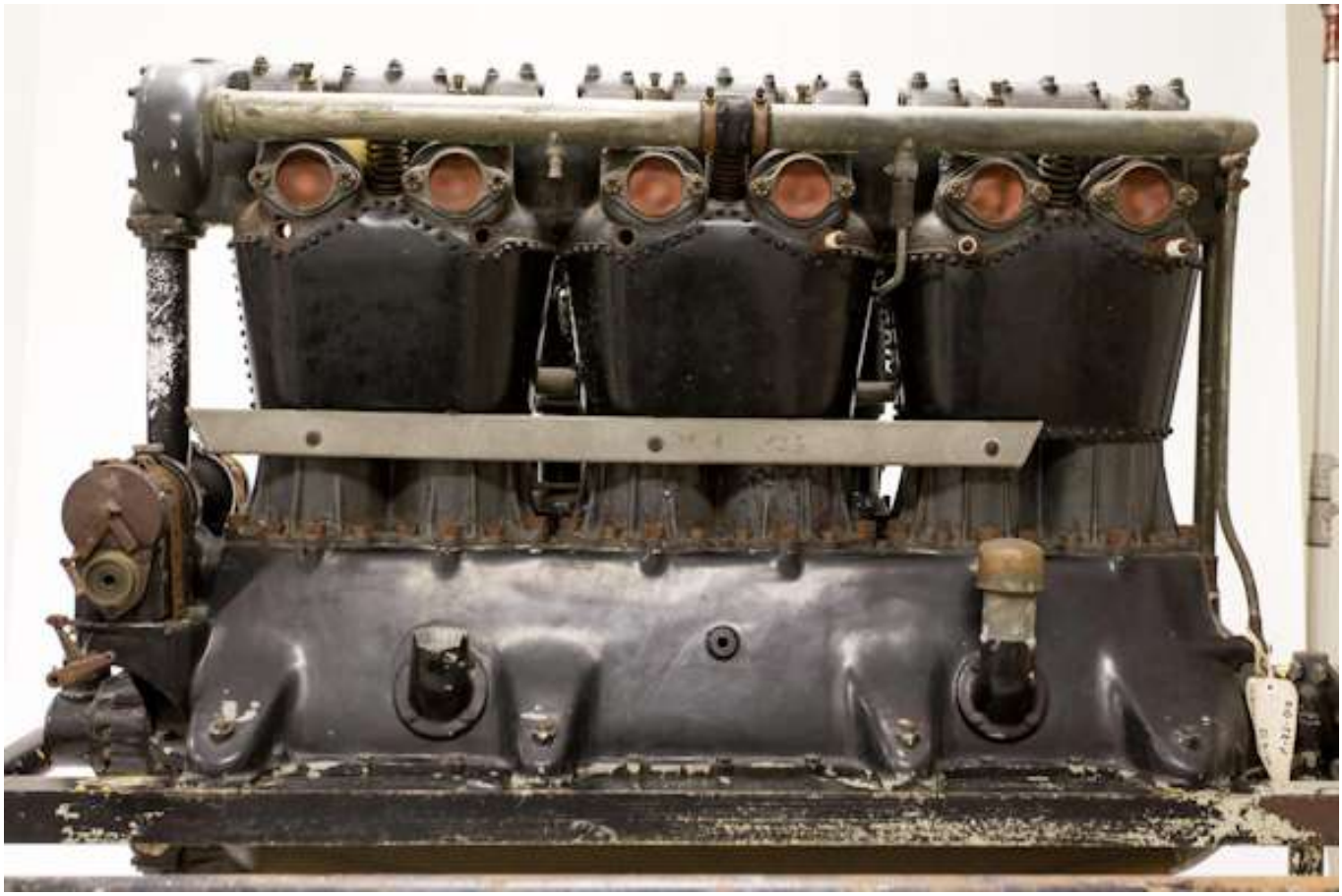
‘Isotta Fraschini’ engine:

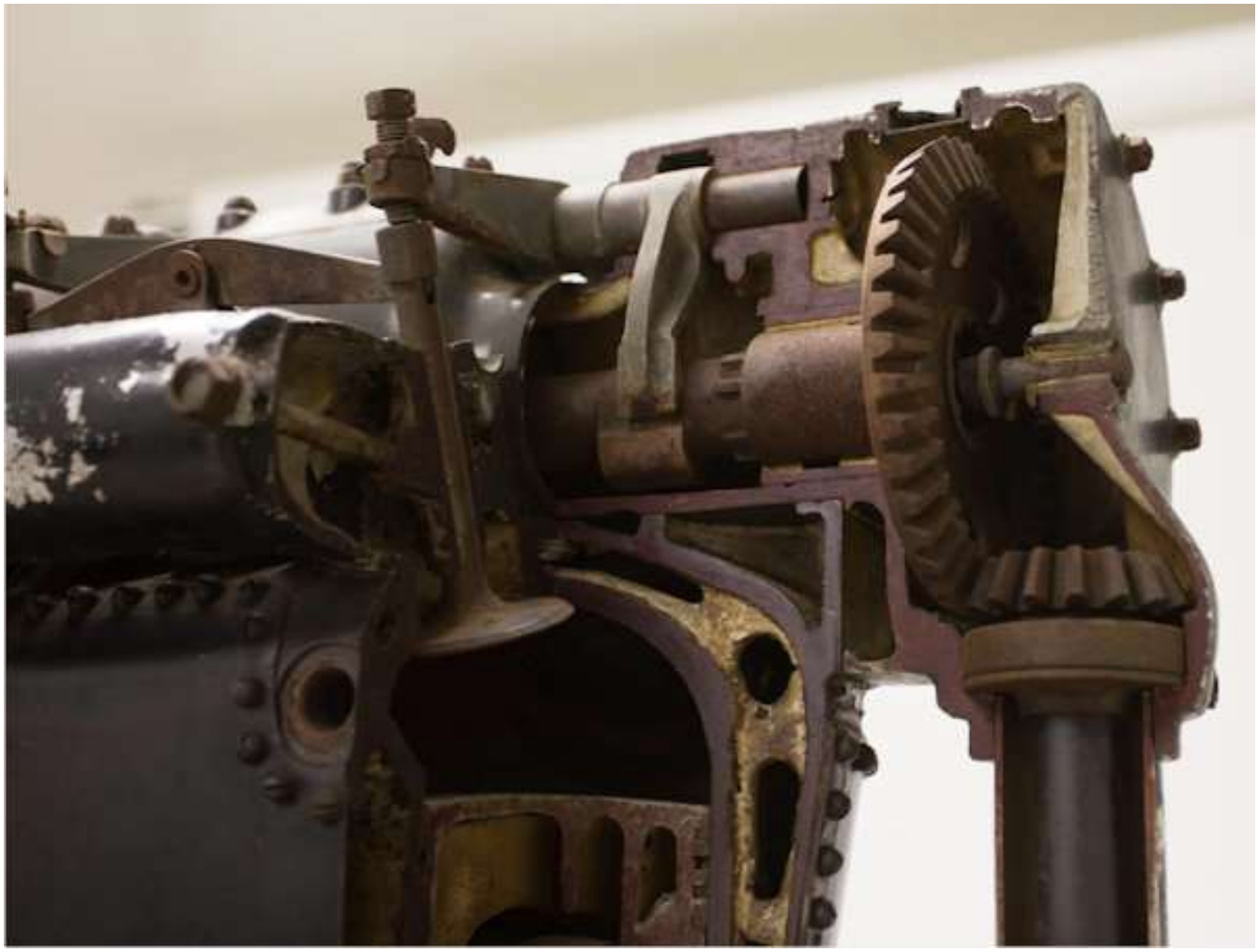
The Macchi M.5 was generally fitted with either the ‘Isotta Fraschini V4B’ six cylinder engine or the V6 version. Although designated ‘V’ engines, they were in fact of a 6 cylinder in-line design. Of the ten ‘Isotta Fraschini’ engine types built between 1911 and 1923, only the V7 (12 cylinder) built in 1917, was actually a ‘V’ cylinder design. Both the V4B and V6 engines were basically the same, except the V6 version had a longer piston stroke and was overall slightly larger. Also the engine exhaust pipes were arranged differently.

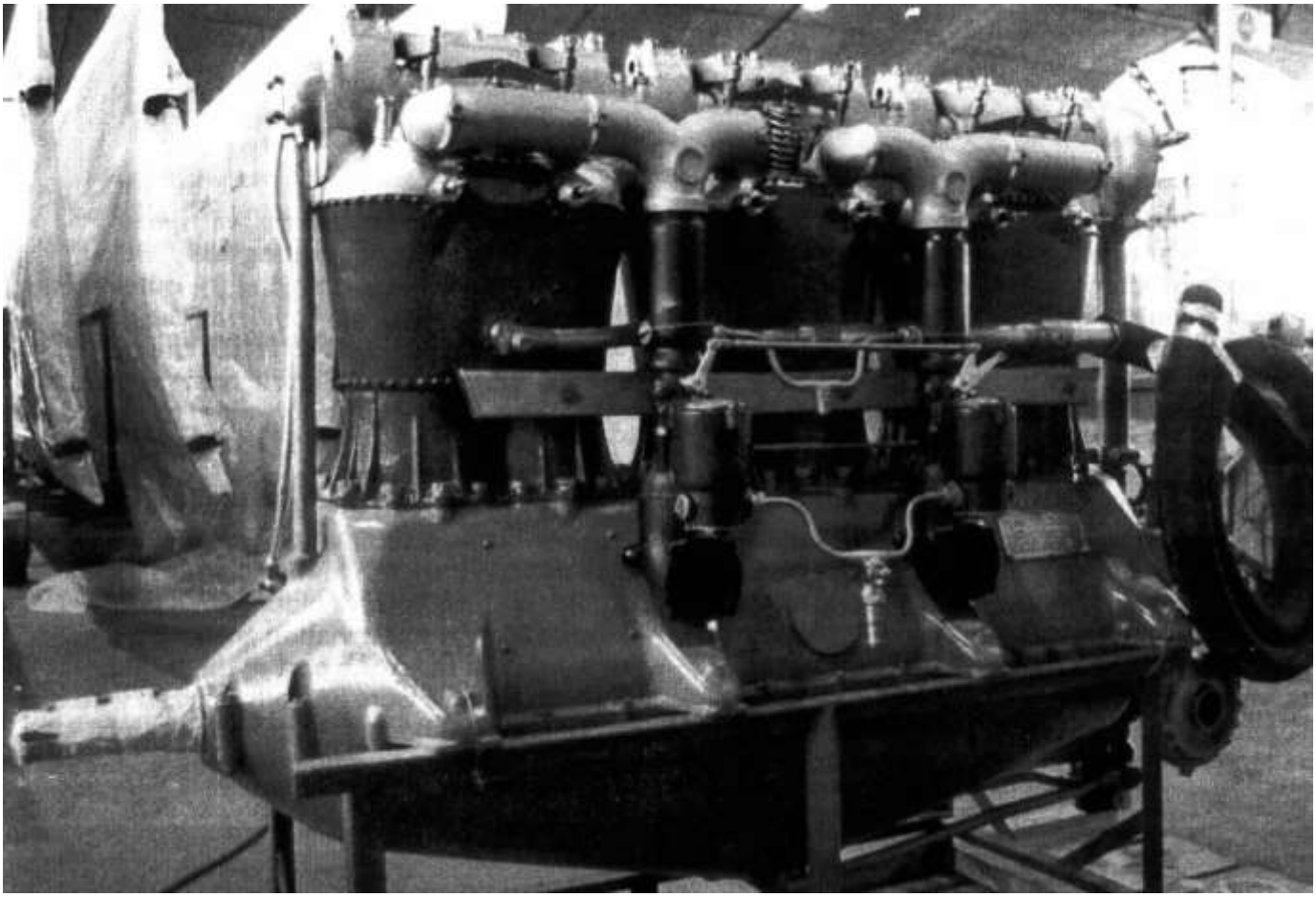
The Macchi M.5 was most commonly fitted with the ‘Isotta Fraschini V4B’ engine and the following drawings and photographs show typical installations of this engine type.

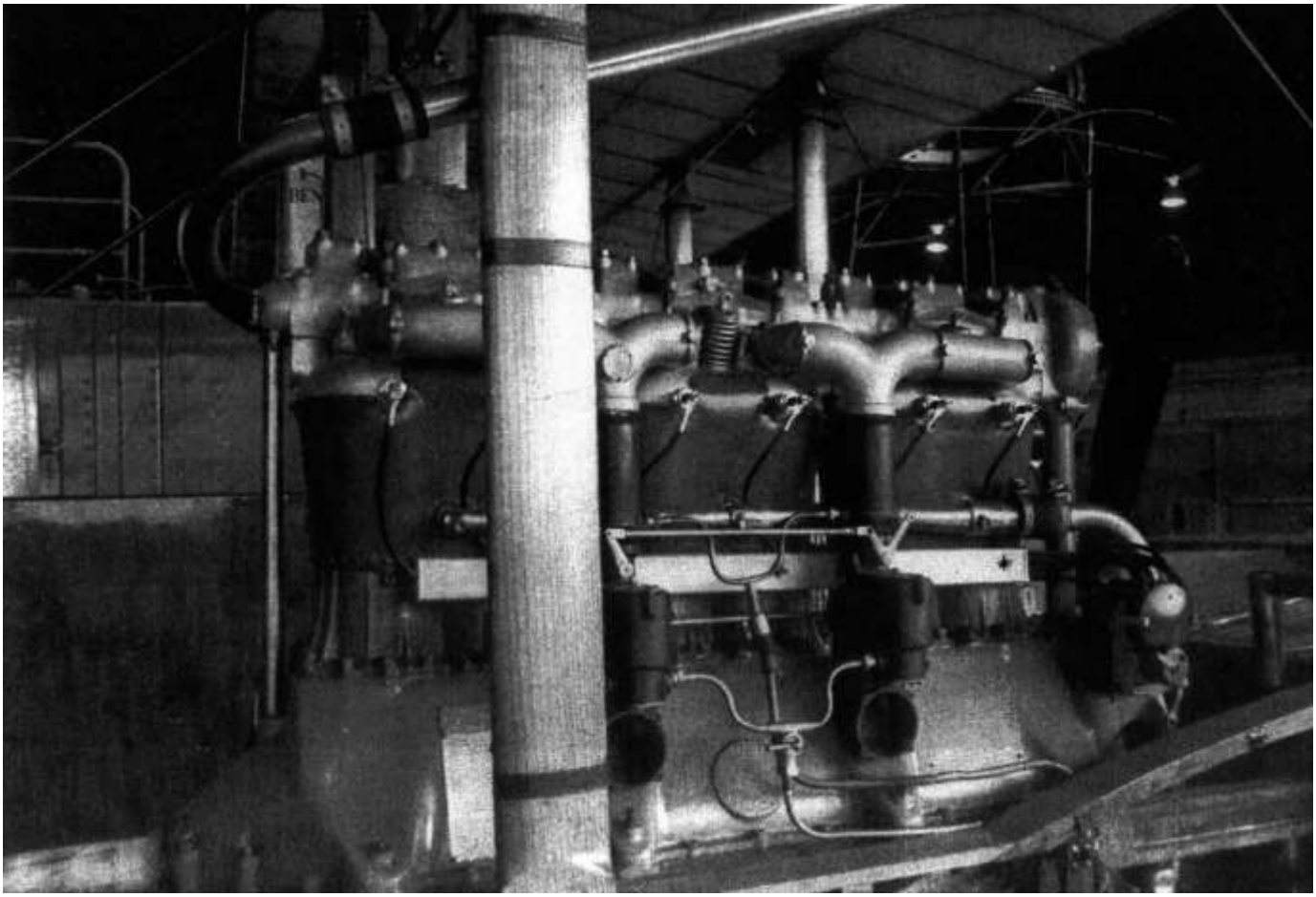












NOTE 1: ***The modifications I will embody on the engine are by using components from my 'spares' collection, by 'scratch' building or using aftermarket parts. I would suggest that for those modellers who have neither the spares or are feel they are not competent to scratch build parts, building the engine as supplied in the kit is probably the better option.***

NOTE 2:

Resin parts can be extremely small and being resin, very delicate. Great care needs to be exercised when cutting the parts away from the resin backing and in subsequent 'cleaning up'. Also take precautions to avoid losing small parts to the 'carpet monster' as although there are a few spares supplied with the kit, if you do lose a part you may end up having to contact 'HPH Models' to see if they can supply replacements, which may not be possible.

Engine - modifications required:

The late 'Des Delatorre', a renown modeller, compiled a build log when he made this particular model. During his build he picked up on areas of the build that he felt were either incorrect, omitted or not in scale. https://www.ww1aircraftmodels.com/page52.html

In summary:

Valve gear operating shaft mountings misaligns with engine mountings.
Cylinder cooling jackets - missing fasteners on one side.
Rocker assemblies were modified.
Location of engine spark plugs.

No magnetos or spark plugs supplied in the kit.
Additional pipework, cables or wire detail required.
Bottom of crankcase required reducing to fit support frame.

Whether any or all of the apparent areas of concern have been addressed by ‘HPH Models’ since the build by ‘Des’ remains to be seen, but whatever, there will be parts either corrected, modified or made from scratch. Such is modelling and especially when working with resin ‘limited run’ kits.

During my own research I’ve found many anomalies with the engine, such as:

The twin carburettors and induction pipes in the kit are incorrect as the carburettors are not joined and located higher up on the engine crankcase. Also the intake manifold pipes are too long.

There is no water pump or oil pump and associated pipework supplied in the kit, possibly to there being no space available between the engine and rear of the radiator.

No engine controls are available in the kit (as expected).

The inlet and exhaust valves are operated by the overhead shaft. The kit shaft is moulded as one shaft. The actual engine had three separate shafts.

No spark plug locations, magnetos, ignition lead support tubes.

Cylinders separated at the base, not joined.

No oil pump or oil fillers (x2) for the crankcase.

No engine data plate decals.

Valve lever operating shaft:

The overhead valve lever operating shaft from the kit has three problems:

The shaft mountings to the engine do not align.
The actual engine was fitted with three separate shafts for the valve operating levers.
The kit supplied ‘single’ shaft for the valve operating levers does not have the lower half of the assembly, which housed the camshaft drive to the valve operating levers.

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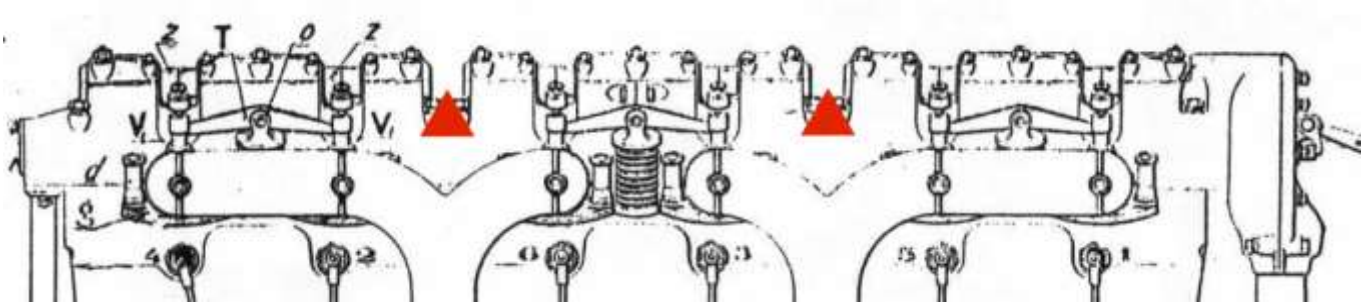


To convert the kit ‘single’ valve lever operating shaft for the valve levers:

Cut the shaft between the nine mountings (3 larger central and 6 end mountings) to separate the mountings.

File or sand away the stubs of the shaft from both sides of each mounting, leaving a slight ‘witness’ mark on the mountings.

Point mark the centre of the ‘witness’ mark on both ends of each mounting.

Centre lever operating shaft:

NOTE: *When drilling through each mounting:*

Start with a small drill and step up the drill sizes until the final hole is drilled.

Drill from both ends of the mounting to avoid the drill running out of alignment through the mounting.

Frequently clear the drills of resin swarf, to avoid swarf pressure building up in the hole and possibly breaking through the wall of the mounting.

Try to keep the drill parallel through the mounting, when viewed from the sides and top/ bottom of the mounting.

Drill a hole of approximately 0.6 mm diameter through the centre of a large central mounting and two smaller end mountings, using the point mark on the ‘witness’ mark.

Follow up by drilling a larger hole of approximately 1.2 mm diameter through each mounting.

Finally drill a hole of 2.0 mm diameter through each mounting.

Slide a length of 1.8 mm diameter tube (e.g. ’Albion Alloy’s’ MBT08) through each mounting as check the larger drilled hole allows the tube to be aligned parallel when viewed from the sides and top/bottom of the mounting.

File or sand away the remaining ‘witness’ marks from both ends of each mounting.

Cut a 10 mm length of 1.8 mm diameter tube.

Slide onto the tube a smaller end mounting. Make sure it sits at 90 degrees to the tube and is just in from the end of the tube.

Secure the mounting to the tube using thin CA adhesive.

Slide onto the tube a larger central mounting. Make sure it sits at 90 degrees to the tube. **Do not secure it position** but leave it loose.

Slide onto the other end of the tube a smaller end mounting. Make sure it sits at 90 degrees to the tube and is just in from the end of the tube. *Also make sure it is aligned to the first smaller mounting fitted.*

Secure the mounting to the tube using thin CA adhesive.

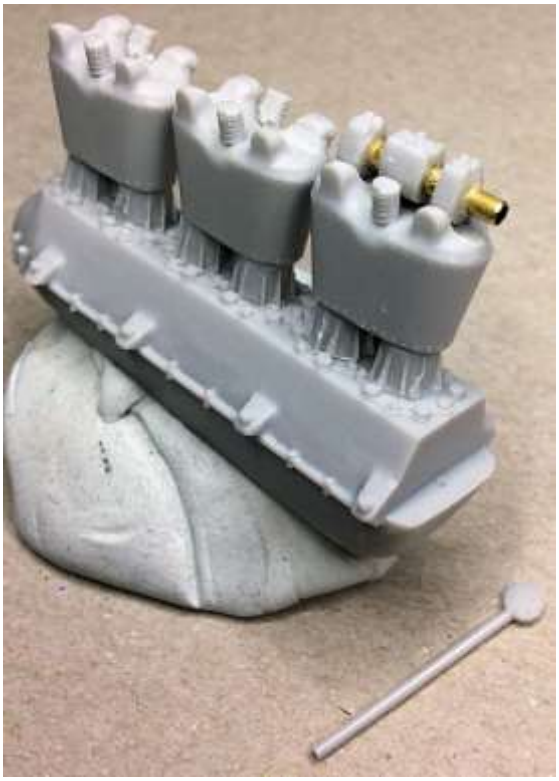
Align the larger central mounting with the two smaller end mountings and centrally between the two.

Secure the mounting to the tube using thin CA adhesive.

Test fit the assembly in position on the centre cylinder heads and check that the curved bottoms of the mountings seat fully into the locations. If necessary use a round needle file or curved edge scalpel blade to remove resin from the locations to obtain a good fit.

Forward (radiator end) operating shaft:

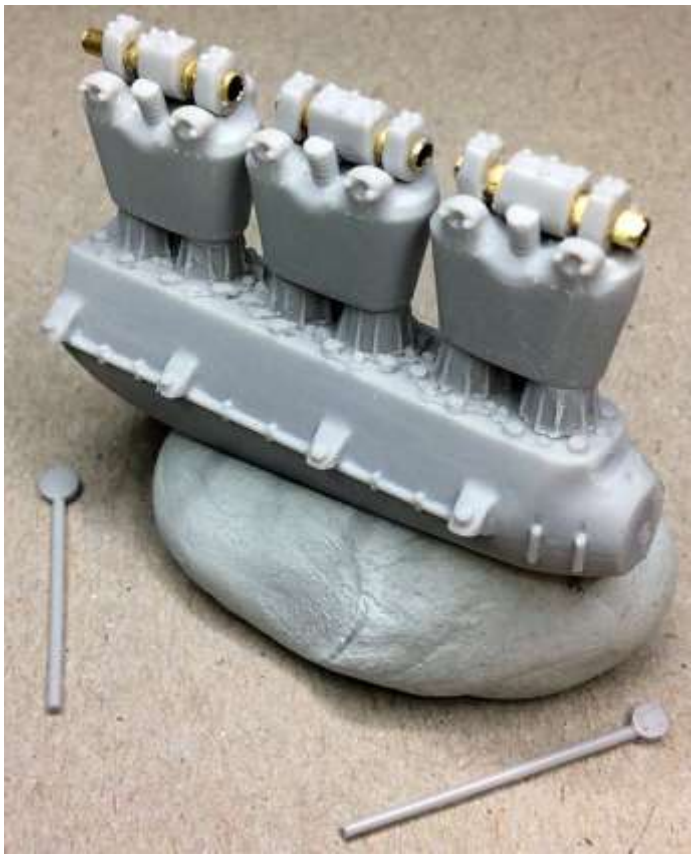
Repeat the above procedure except cut the 1.8 mm diameter tube longer (12 mm), to allow it to contact the housing on the vertical drive (kit part 43) at the forward end of the engine. The tube at this end needs to protrude by 2 mm.



Rear (propeller shaft end) operating shaft:

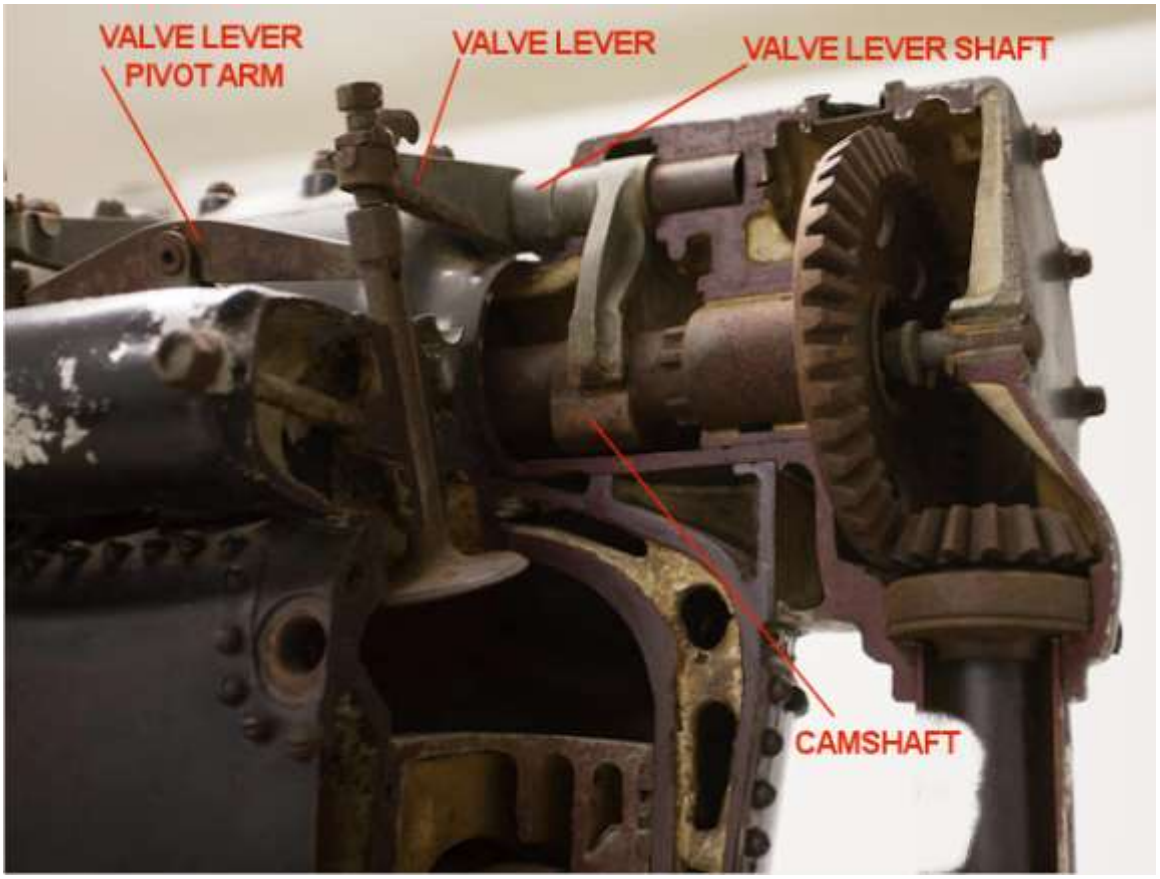
Repeat the above procedure except cut the 1.8 mm diameter tube longer (2 mm), to allow it to contact the housing on the vertical drive (kit part 42) at the rear end of the engine. The tube at this end needs to protrude by 12 mm.

The end result is three separate shafts for the valve operating levers. **Do not secure them in position at this stage.**



Camshaft housing:

The three pairs of valve operating levers pivoted on the three separate overhead shaft above the cylinder banks. The valves themselves were operated by a camshaft located in the housing below the overhead shafts. The cams on the shaft moved cam followers on the overhead shafts to pivot the valve levers, so opening or closing the relevant valves in the cylinder heads. The camshaft is not represented in the kit parts.



To represent the camshaft:

NOTE: *The modifications I will embody on the engine are by using components from my 'spares' collection or by 'scratch' building.*

Cut a length of 1.8 mm diameter tube long enough to span between the outer ends of the front and rear cylinder banks.

Position the tube along the centre of the engine, between the lugs and valves. Secure it using CA adhesive.

Overhead lever shafts - fitting:

Position all three overhead lever shafts assemblies on the engine, as shown in the previous photographs. Make sure the two end assemblies have the extended tube ends facing the front and rear of the engine.

Secure the three overhead lever shaft assemblies on the top of the tube and secure using CA adhesive.

Make sure the extended tube of the end assemblies align vertically with the previously fitted tube.

All three assemblies sit vertically.

The gaps between the overhead lever assemblies mountings should align with the gaps each side of the valves.

Magneto - drive shaft assembly:

Modify an appropriate magneto drive shaft assembly (I used one from a ‘Wingnut Wings’ Daimler -Mercedes’ engine) from ‘spares’ to fit on the forward (radiator end) of the engine. The top housing of the drive shaft should cover the tube ends of the ‘camshaft’ and the end overhead lever shaft assemblies.

Magnetos:

Assemble two magnetos from the ‘Shapeways’ 3D printed 1:32 German magneto set and secure them on each side of the base of the installed magneto drive shaft.

Rear drive shaft:

Modify an appropriate magneto drive shaft assembly (I used one from a ‘Wingnut Wings’ Daimler -Mercedes’ engine) from ‘spares’ for fitting on the rear (propeller end) of the engine.

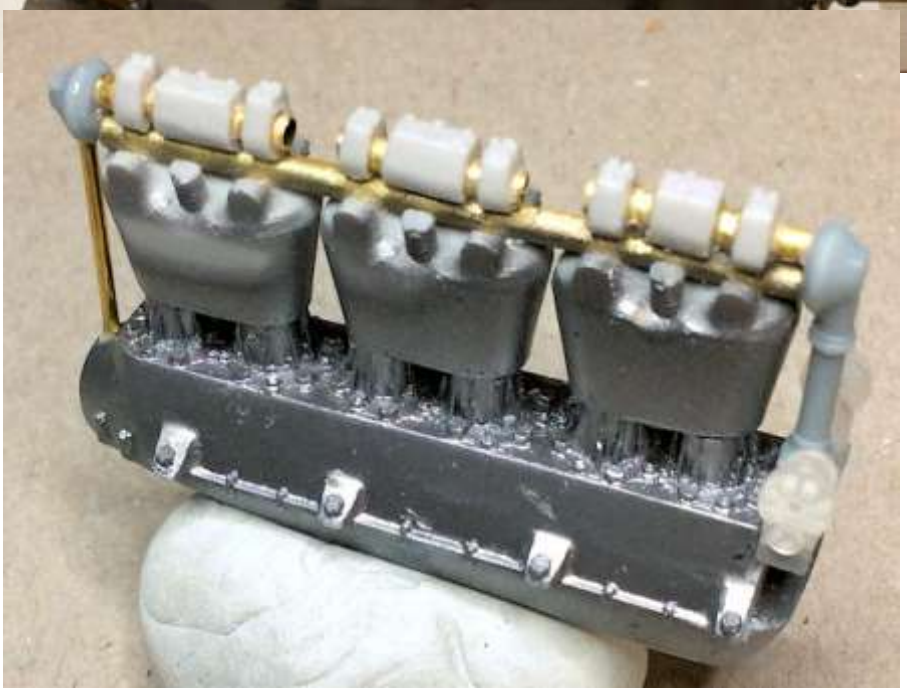
Cut away the shaft leaving just the drive head.

Drill a 1.0 mm diameter hole into the bottom of the drive head and secure a length of 1.0 mm diameter rod in the hole, using CA adhesive.

Drill a similar hole into the top of the propeller shaft housing on the engine.

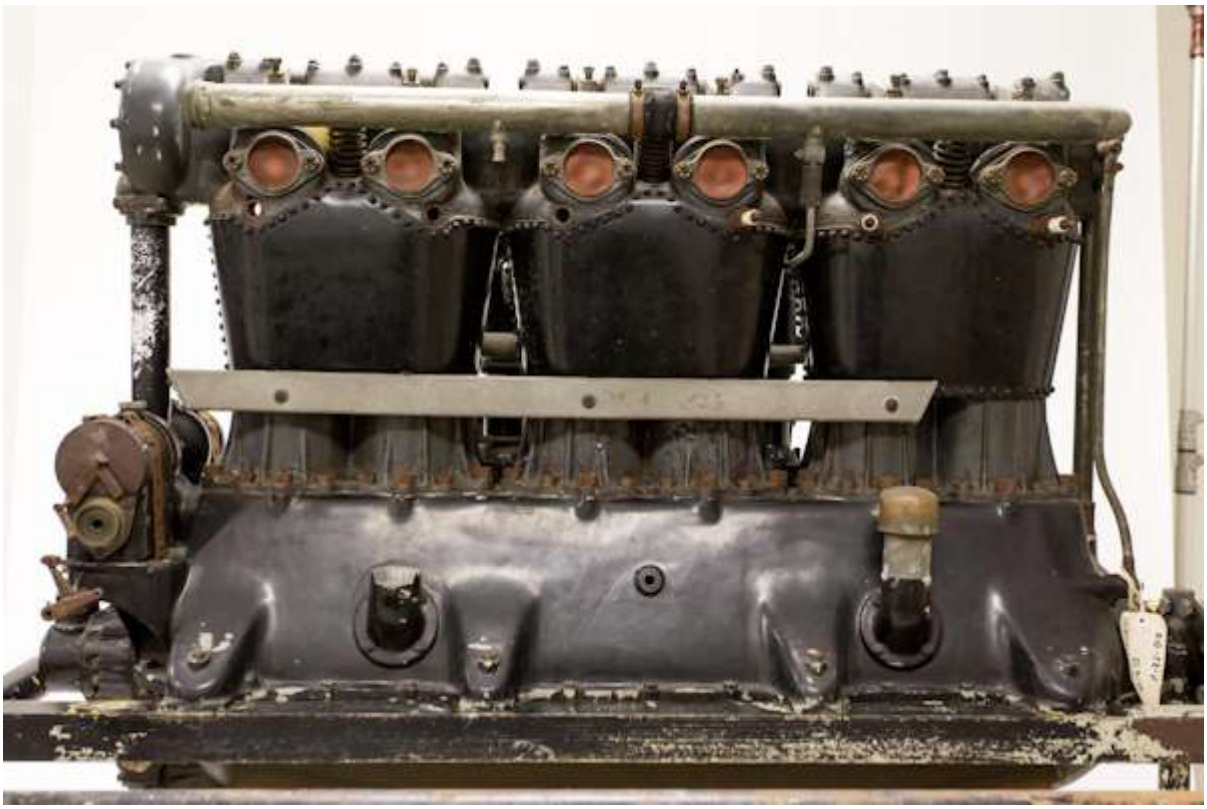
Cut the rod so it will locate into the drilled hole. The top housing of the drive shaft should cover the tube ends of the ‘camshaft’ and the end overhead lever shaft assemblies.

Secure the drive to the tube ends and engine using CA adhesive.



Cylinder banks - infill:

The two cylinder bases at the bottom of each of the three cylinder banks were joined at the centre and not separated, as on the kit engine. The only spaces between cylinders was between the centre cylinder bank and the two end cylinder banks.



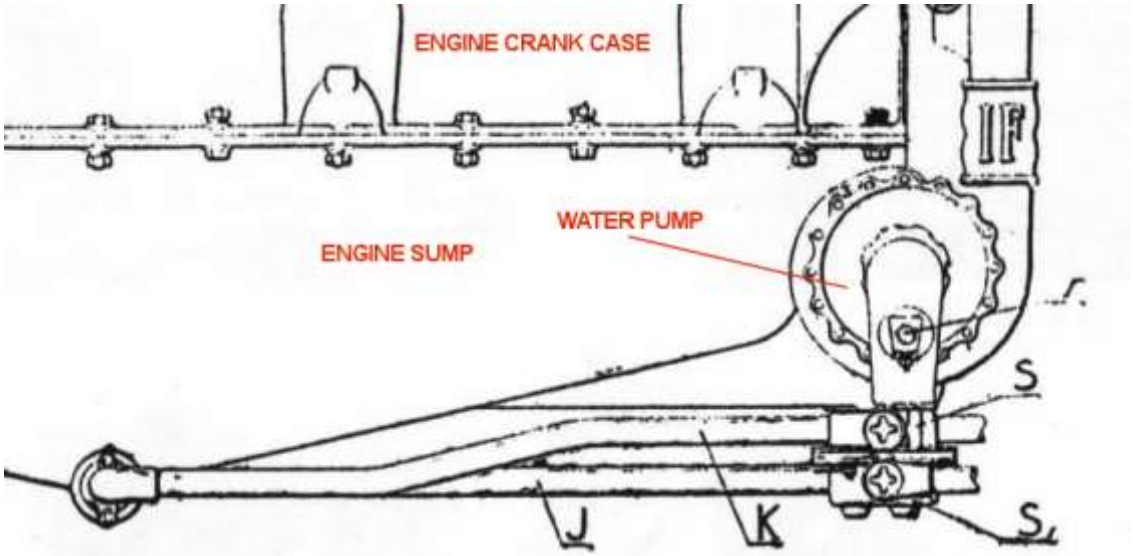
Scrape one end of a wood tooth pick to a fine ‘chisel’ tip.

Using a modelling putty (e.g. ‘Vallejo’ Plastic Putty 401 or similar), fill and form a ‘fillet joint’ between the two cylinder bases at the bottom of each of the three cylinder banks.

Wait until the putty is semi-dry then use the chisel end of the tooth pick to form the fillet in-fill, including a central ‘seam’.

Water pump:

The engine was fitted with a water pump for the cooling system. On the actual engine the pump was located forward (radiator end) of the engine, below the magnetos and engine sump/crank case joint.



NOTE 1: *In order to represent a water pump and because the kit engine is not designed to have a water pump fitted, modification to this end of the engine sump is necessary.*

NOTE 2: *Due to restrictions on the engine, the location of the fitted water pump is higher on the engine than was actually the case.*

Using a modellers saw, carefully cut away the curved step at the radiator end of the engine sump. This step was intended to fit under the installed radiator.

File or sand flat the cut vertical face of the sump.

Modify two upper halves of an engine propeller shaft cover (I used two from 'Wingnut Wings' Daimler-Mercedes' engines) from 'spares'. The two covers, when joined, should fit onto the cut surface on the sump.

Secure the two cover halves together using styrene cement (e.g. 'Tamiya' Thin or similar).

Secure the cover assembly to the cut face of the sump using CA adhesive.

Modify a water pump (I used one from 'Wingnut Wings' Daimler-Mercedes' engine) from 'spares'.

Cut a notch into the engine mounting lug at the forward (radiator end) of the engine, on the left side when viewed from that end of the engine.

Secure the water pump onto the cut notch and the end of the base of the magneto drive shaft assembly.

Engine radiator and fairing:

At this point in the build, the engine radiator and housing as well as the engine bottom fairing need to be assembled in order to be used during the subsequent changes to the engine.

Radiator:

NOTE: *When cutting out parts from the photo-etch sheet, try to keep the sheet flat otherwise some parts can become distorted.*

WARNING: *Take care when handling photo-etch, as the thin metal, especially after being cut out, can be sharp and cause injury.*

Remove the photo-etch parts7, 10 (x2) and 25 from the supplied sheet.

Remove any stubs of photo-etch from the edges of the parts.

Using a low heat source (e.g. cigarette lighter or candle) 'wave' each part over the flame and watch for the part to discolour. *Don't linger over the flame or the photo-etch may distort or even melt.*

Doing this not only anneals the photo-etch, making it easier to bend, but also creates a finish of heated metal.

To aid adhesion of paint primer and adhesive, clean the grill carefully by wiping both sides of the grill with a degreaser, such as spectacle wipes or Isopropyl Alcohol (airbrush cleaner).

Lay part 7 (radiator surround) on a flat surface and position the radiator body (19) centrally between the two middle brackets.

On the radiator surround, mark the outer edges of the bottom of the radiator body.

Using the marks, position the radiator surround on the bottom of the radiator body and bend it around the sides of the body.

Hold the surround in position on the radiator body and bend the sides of the surround over the top of the radiator body.

Remove the surround and carefully 'square off' the bends to create a good fit to the radiator body.

Refer to the instructions and bend the two lower brackets as shown.

Clean up the radiator body(19).

Airbrush prime the body with a grey primer (e.g. 'AK Interactive' Grey AK758 or similar).

Airbrush the body with 'Tamiya' Rubber Black (XF85).

Using thin CA adhesive at the edges of the body only, carefully position and secure the photo-etch radiator grills (10).

Locate the header tank (25) on the top of a radiator grill (below the radiator filler cap) and secure using thin CA adhesive.

Refer to the instructions and locate the radiator surround around the body, securing it in position using thin CA adhesive.

Radiator housing and bottom fairing:

NOTE: *Only the radiator housing and bottom fairing are assembled at this point. All other detail will be added later in the build.*

Carefully cut out the radiator opening from the housing (32) and clean up the edges.

Clean up the edges of the bottom fairing (15).

Airbrush prime the inside only of the housing and fairing with a black primer (e.g. 'Alclad' Gloss Black ALC-302 or similar).

Airbrush the inside only of the housing and fairing with Aluminium (e.g. 'Alclad' Duraluminium ALC-102 or similar).

Test fit the radiator surround onto the bottom fairing. Make sure the two are in full contact and that the radiator housing sits vertical on the front of the bottom fairing.

Secure the two together using CA adhesive.

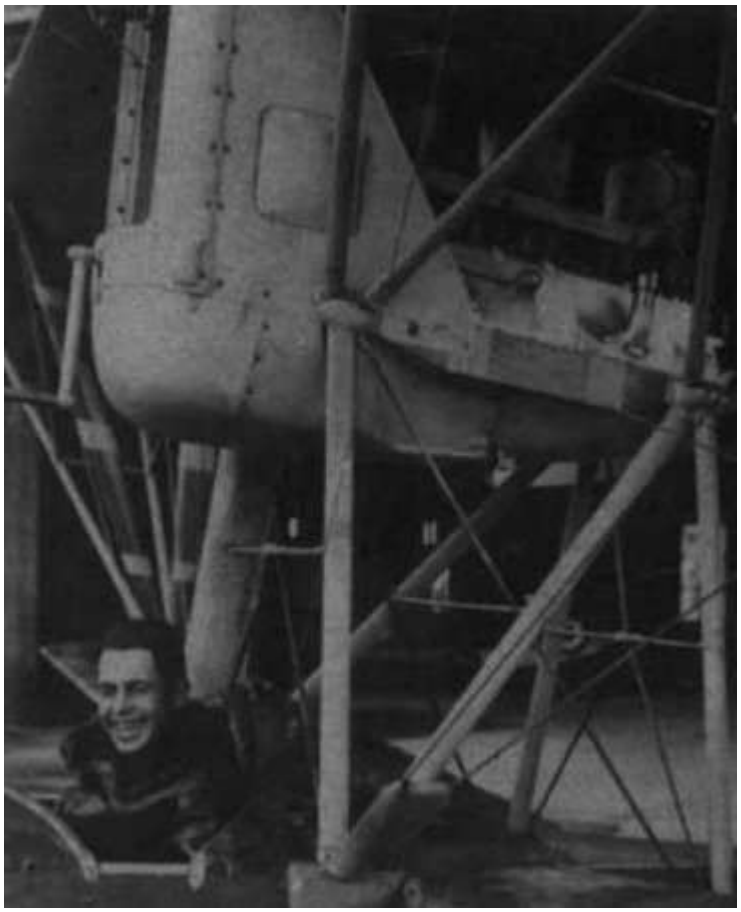
Mask off the inside surfaces painted with Duraluminium.

Airbrush prime the outside surfaces of the assembly with a grey primer (e.g. 'AK Interactive' Grey AK758 or similar).

Airbrush the outside surfaces of the assembly with 'Tamiya' Ocean Grey (XF82).

Radiator - fitting into housing:

NOTE: The *radiator assembly was not flush with the front surface if the radiator housing, but set back into the housing (see photograph below).*



Test fit the radiator assembly into the rear of the housing with the header tank facing rearwards.

Make sure the radiator seats vertically behind the cut out in the housing. If not, carefully scrape away resin from the inside edges of the housing and/or file away the front edges around the radiator surround until a good fit is achieved.

Secure the radiator in position using thin CA adhesive.

Engine - test fit:

Before continuing with the engine changes, the engine needs to be test fitted into the fairing/ radiator housing and support struts. This is necessary to ensure the changes made to the engine thus far will allow the engine to seat correctly in the structure.

Dry fit the engine support struts into the fuselage locations and hold the fairing/radiator assembly under the photo-etch engine bearers.

Locate the engine assembly onto the top of the photo-etch bearers and check if the inner edges of the bearers are under the mounting lugs on the engine.

NOTE: *I found that I had to scrape away resin from the following areas to achieve a good fit:*

Reduce the thickness of the inner edges of the top member of each strut assembly (under the engine bearers).

Reduce the thickness of the outer edges of the engine bottom fairing, where it locates under the engine bearers.

Remove resin from along the engine sump under the engine mounting lugs to allow the 'plates' to move towards the engine and reduce any gap.

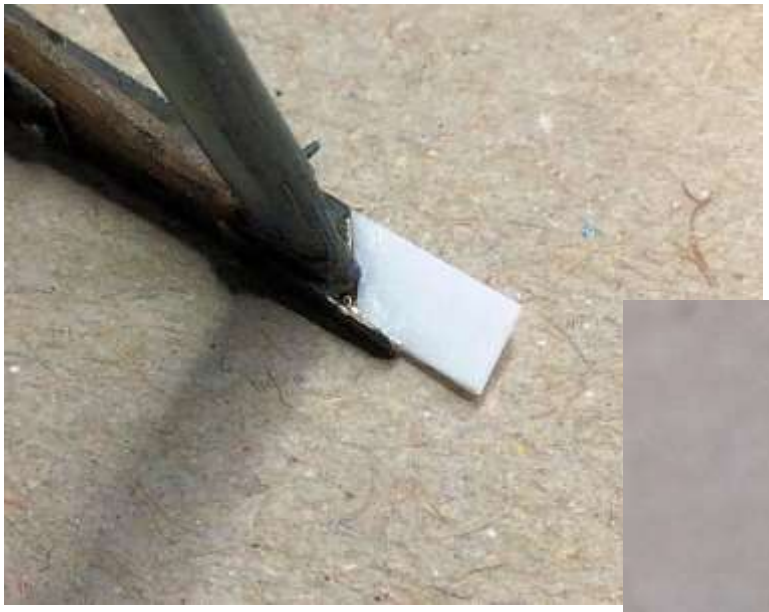
Remove resin from the bottom and sides of the sump until the engine sits low enough.

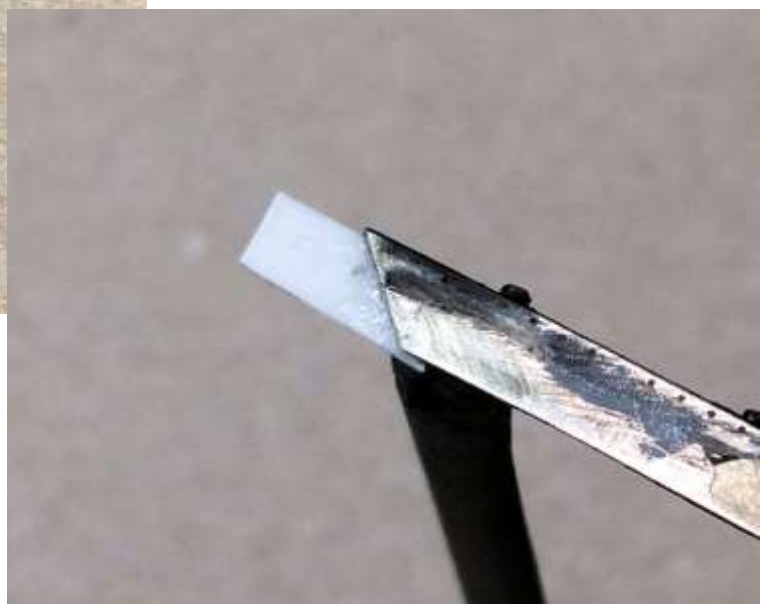
Additional engine support plates:

NOTE: *I found that when dry fitting the engine into the support struts and aligning the crankcase rearmost bolts at the rear of the photo-etch bearer plates, the crankcase front bolts were clear of the bearers.*

Cut two pieces of 0.3 mm thick plastic card to extend the front of the photo-etch bearers by 3 mm.

Secure the extensions under the bearers using CA adhesive.

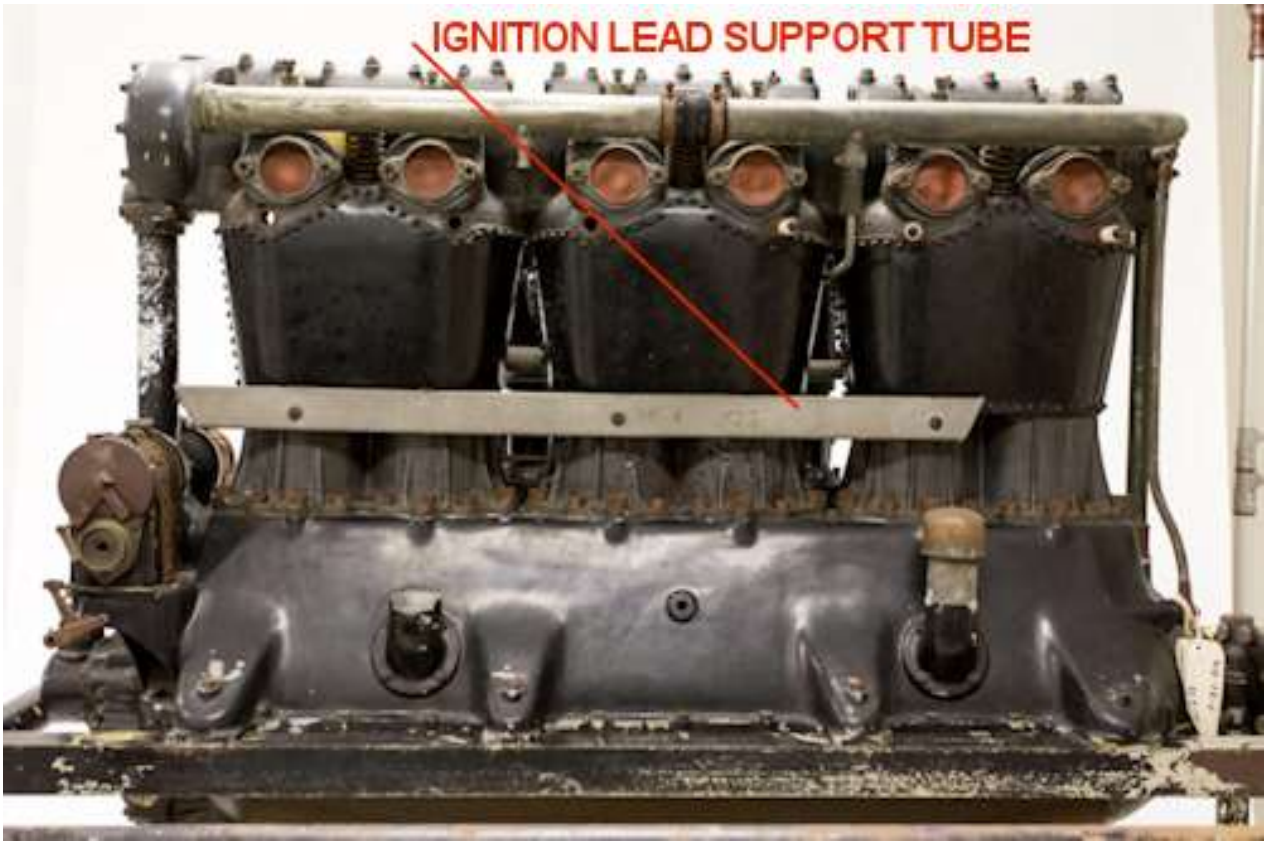




Ignition leads - support tubes:

On each side of the engine are flat section tubes that are attached at the bottom of the cylinder heads. These tubes retain and support the six ignition leads on each side of the engine.

The kit supplies photo-etch parts which need to be bent to represent the two support tubes. However, when created, these photo-etch tubes are much larger than show in photographs above. Therefore I decided to create the two support tubes using micro-tube.



Cut two 30 mm lengths of 1.6 mm diameter brass tubing (e.g. ‘Albion Alloys’ MBT16 or similar).

Slide each tube onto a 0.5 mm diameter solid rod (e.g. ‘Albion Alloys’ MBR05).

Holding the rod, use a low heat source (e.g. cigarette lighter or candle) and ‘wave’ each part over the flame and watch for the part to discolour. Doing this anneals the metal making it easier to form.

NOTE: *During the next step regularly remove the tube to check its shape.*

Locate the tubes (still on the rod) one at a time into a smooth jaw vice and slowly crush the tube to create a ‘flat sided’ oblong shape.

Remove the rod from the tubes.

File the ends of each tube to 60 degrees (refer to the previous photographs).

Lay a tube on one side of the engine cylinders, with the longer side at the top and just under the bottom of the cylinders. Position the tube (refer to the previous photographs).

Mark on the tube the centre of the middle cylinders and the cylinders at the magnetos.

At the marks drill through the centre of the side of the tube using a 0.5 mm diameter drill. *Only drill through that side, not through the other side*.

Cut two short lengths of 0.5 mm diameter brass tube (e.g. ’Albion Alloy’s’ MBT05 or similar).

Insert the 0.5 mm diameter tubes into the previously drilled holes and secure in position using CA adhesive

Repeat for the other tube.

Position each tube on its side of the engine as before and mark, at the bottom of the cylinders, the position of the 0.5 mm diameter tubes.

Drill holes of 0.5 mm diameter into the cylinders at the marked locations.

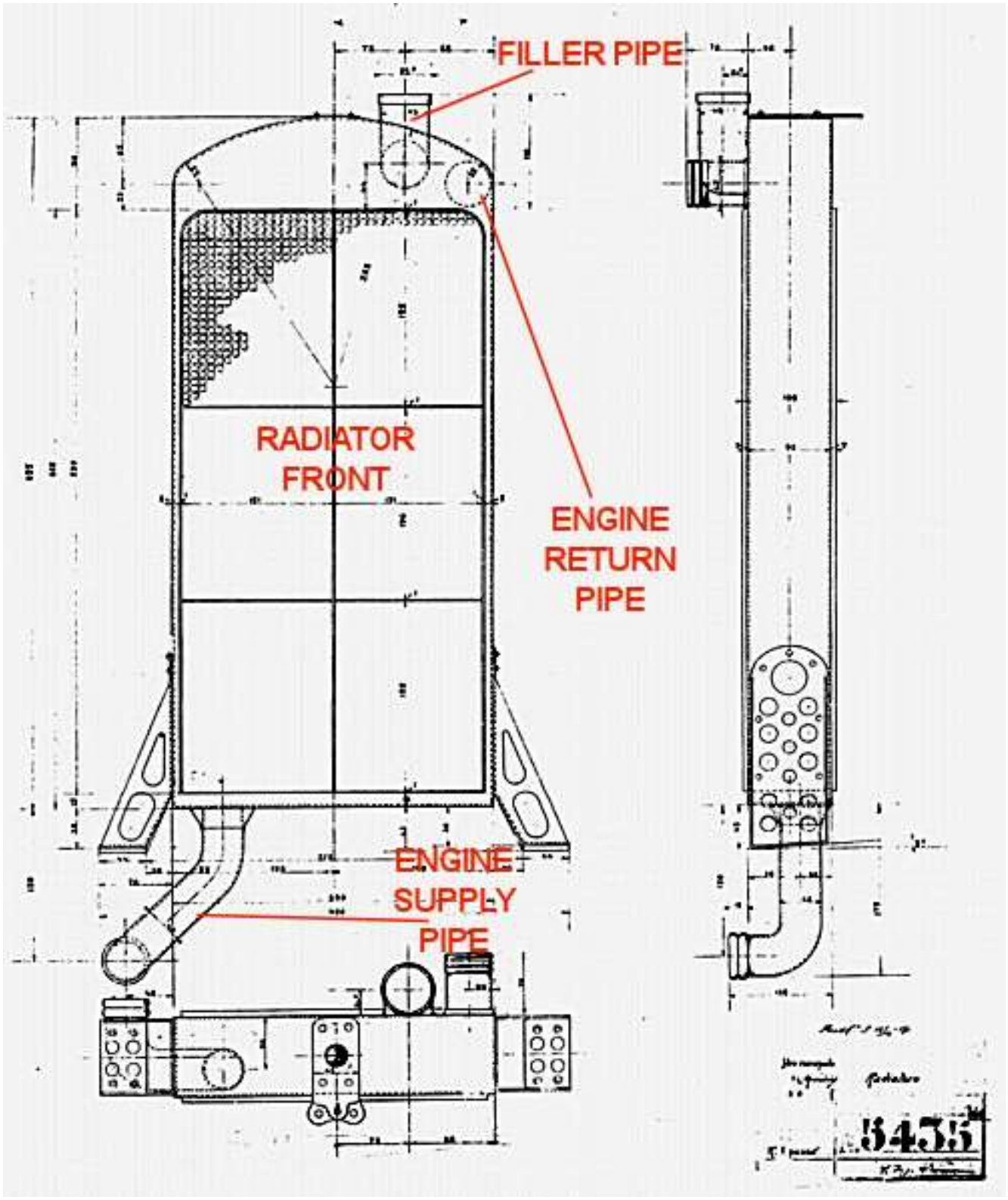
Test fit the tube assemblies to make sure they rest against the cylinders and are parallel to the engine.

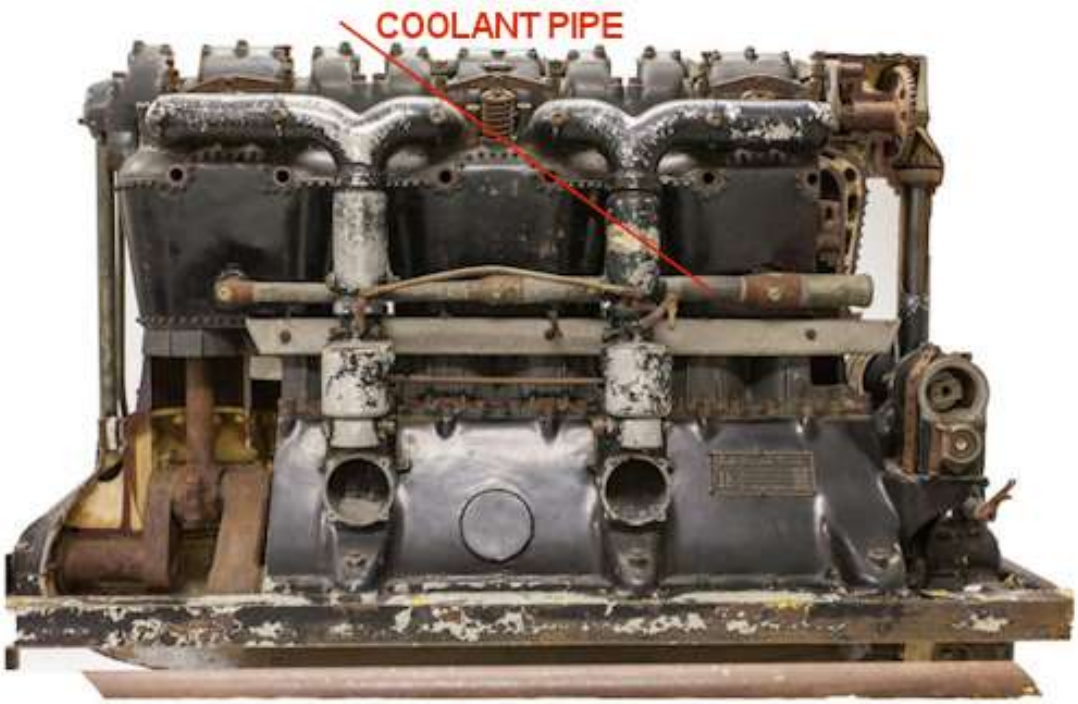
Remove the tube assemblies for fitting later in this build.

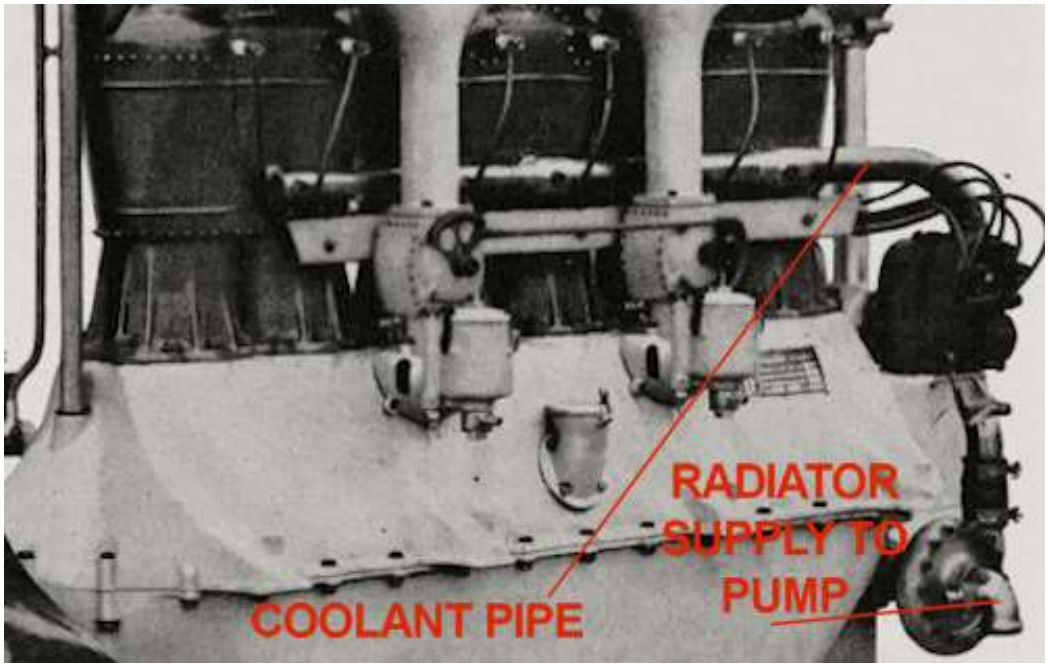
Engine cooling system:

This engine was water cooled. The radiator coolant was supplied to the engine through a pipe at the bottom of the radiator. This pipe was routed up to the water pump and then up and over the magneto to a supply pipe which was attached to one side of the engine. This pipe was connected to each of the three cylinder banks. Coolant was pumped up through the cylinder cooling jackets and then out to a return pipe on the opposite, top side of the engine and back to the radiator to be cooled. The cooling system was filled through a filler pipe located in the top of the radiator. The filler pipe protruded up and through the radiator cowl.

NOTE: *The only coolant pipes that will be visible on the completed engine and therefore represented are the supply pipe, the return pipe and filler pipe,*







Cut a 30 mm length of 0.9 mm diameter brass tube (e.g. ‘Albion Alloy’s MBT09 or similar).

Cut a 1.0 mm and three 2.0 mm lengths of 1.1 mm diameter brass tube (e.g. ‘Albion Alloy’s’ MBT11 or similar).

Slide the 1.0 mm long tube onto the end of the 0.9 mm tube and secure in position using thin CA adhesive.

Slide the three 2.0 mm long tubes onto the other end of the 0.9 mm tube.

Temporarily fit the previously created cooling pipe (refer to the previous photograph).

Position the tube assembly on the cylinder banks and above the cooling pipe.

Position the end of the 0.9 mm tube that has the 1.0 mm tube added in the centre of the end cylinder bank.

Hold the tube assembly in position and slide the first two 2.0 mm tubes along the 0.9 mm tube to align with the centre of the remaining two cylinder banks.

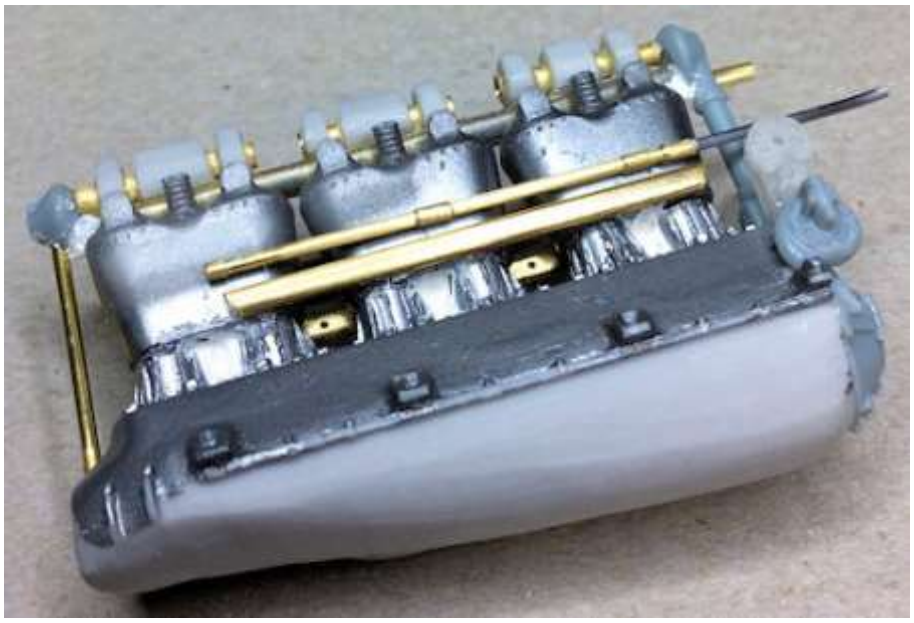
Secure the two 2.0 mm tubes in position using thin CA adhesive.

Position the remaining 2.0 mm tube on the end of the 0.9 mm tube by 1.0 mm, leaving 1.0 mm proud.

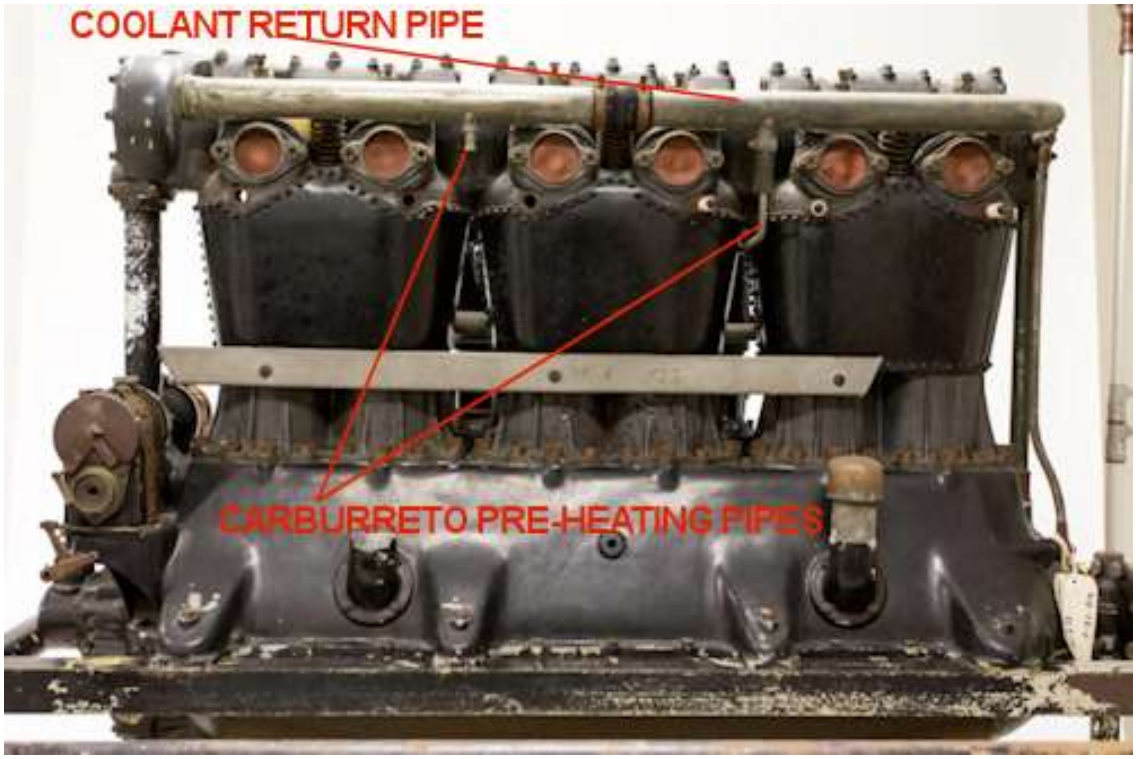
Secure the 2.0 mm tube in position using thin CA adhesive.

Cut a length of 'PlusModel' 0.8 mm diameter lead wire and secure one end into the bore of the previously fitted 2.0 mm long tube.

NOTE: *The coolant pipe assembly will be fitted later in this build. The lead wire will be formed in a curve to connect to the coolant pump previously fitted.*



To represent the coolant return pipe:



A large, hollow pipe is attached and connected to each of the cylinder heads on one side of the engine. Two smaller pipes are connected to the underside of the tube and are routed inboard, between the end and centre cylinder banks. I believe this pipe returns coolant from the top of each cylinder bank back to the radiator. The two smaller connected pipes are possibly connected to the carburettors to use coolant to pre-heat the carburettors and prevent freezing at altitude.

NOTE: *The two small pre-heater pipes to the carburettors will be added with the intake manifolds later in this build.*

Cut a 45 mm length of 1.4 mm diameter tube (e.g. 'Albion Alloy's' MBT14 or similar).

Anneal a length od 0.8 mm diameter tube (e.g. 'Albion Alloy's MBT2M or similar).

On the exhaust ports side of the engine, point mark the centre of the lugs to the left of the valves.

Drill a hole of 0.8 mm diameter vertically down into each lug.

NOTE: *The two small pre-heater pipes to the carburettors will be added with the intake manifolds later in this build.*

Cut a 45 mm length of 1.4 mm diameter tube (e.g. 'Albion Alloy's' MBT14 or similar).

Anneal a length od 0.8 mm diameter tube (e.g. 'Albion Alloy's MBT2M or similar).

On the exhaust ports side of the engine, point mark the centre of the lugs to the left of the valves.

Drill a hole of 0.8 mm diameter vertically down into each lug.

Create a connector tube by bending the end of the annealed 0.8 mm diameter tube through 90 degrees.

Roll cut one end of the formed tube so that it fits fully into the pre-drilled holes.

Repeat to create a total of six connector pipes.

Insert all connector pipes into the pre-drilled holes and turn the tubes so that the protruding ends are facing away from the engine.

Offer up the 1.4 mm diameter tube so that one end is level with the end of the overhead lever shaft at the propeller shaft end of the engine.

Mark on the 1.4 mm diameter pipe the location of the ends of the six connector tubes.

Drill holes of 1.2 mm diameter into the 1.4 mm diameter tube at the connector pipe marks.

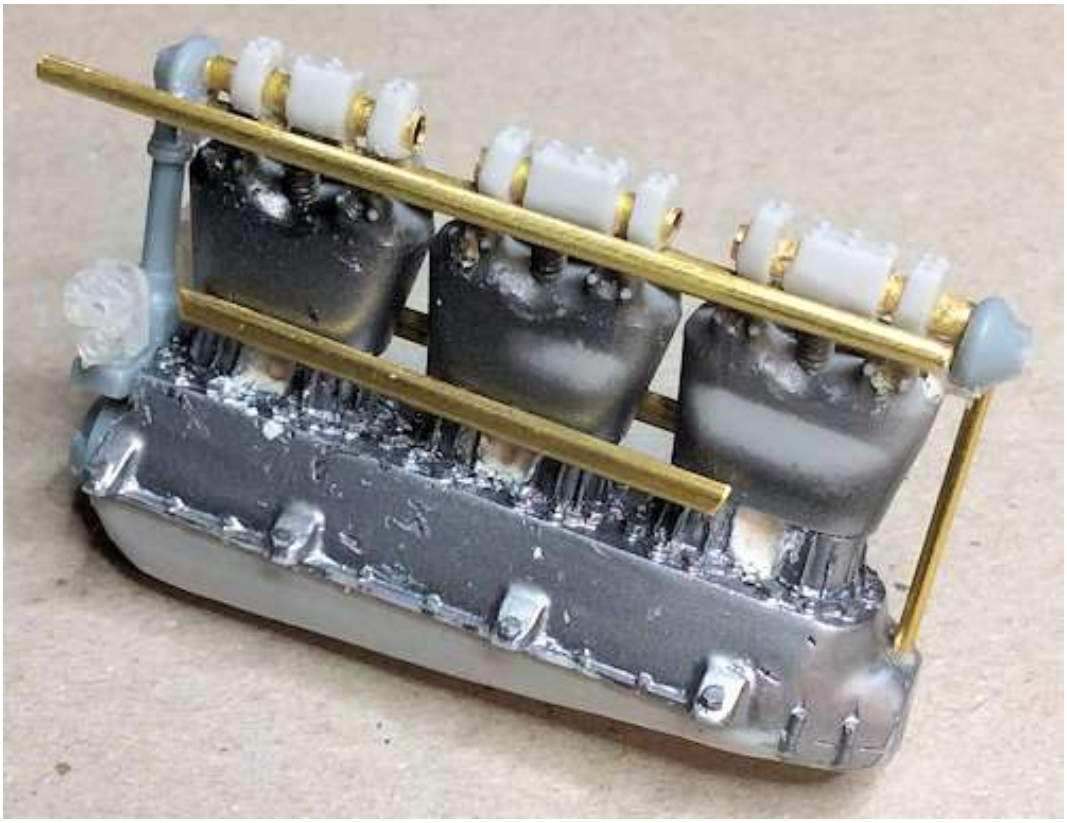
Cut six short lengths od 1.1 mm diameter tube (e.g. 'Albion Alloy's MBT11).

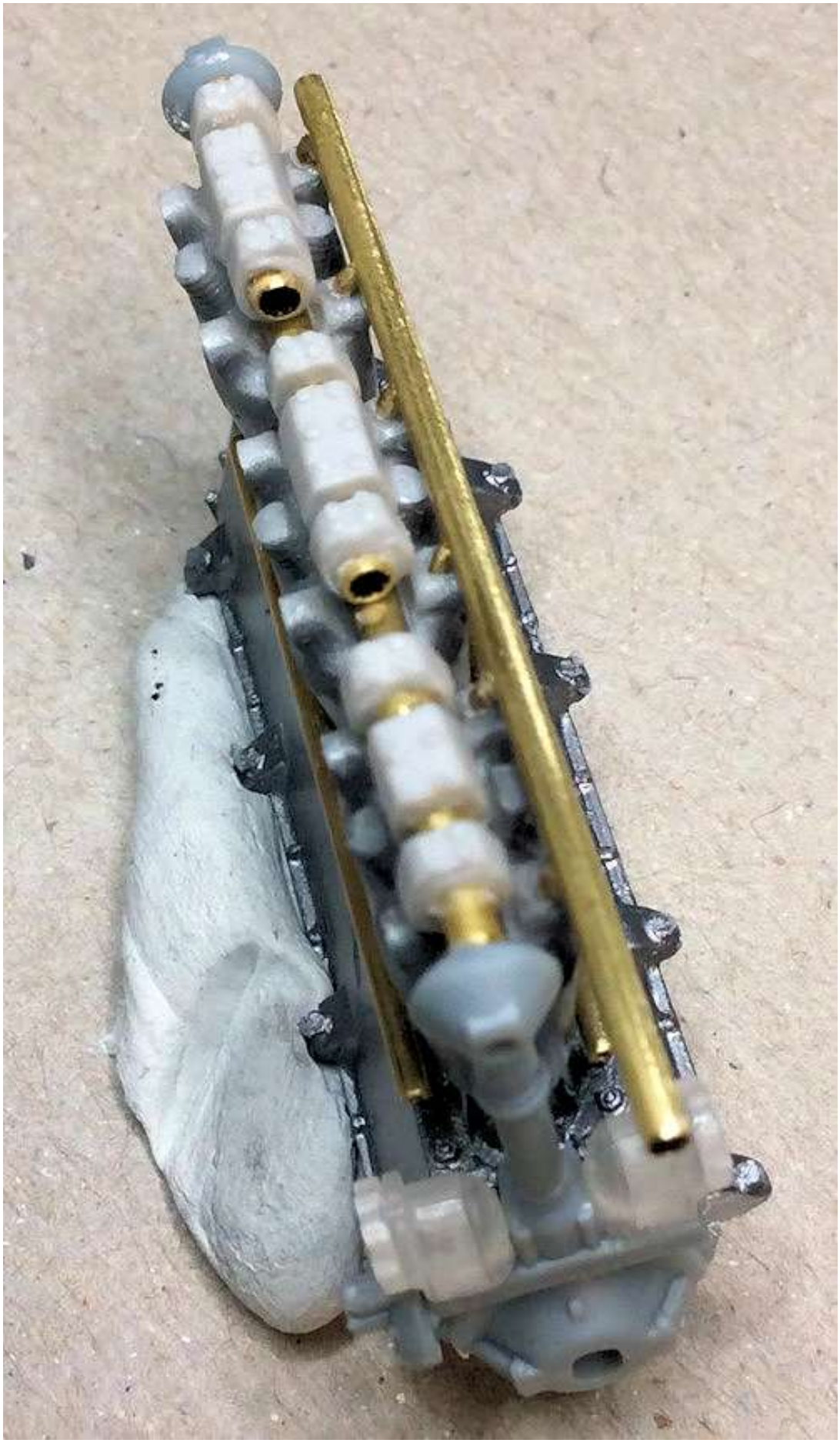
Secure the cut tubes into the pre-drilled hole using CA adhesive.

Carefully locate the pipe assembly onto the six connector tubes. Make sure the pipe locates fully and is parallel to the engine when viewed from the side and above.

With the pipe fully located on the six connector tubes, carefully apply thin CA adhesive to the tubes in the engine (**not to the 1.4 mm diameter pipe**).

Remove the 1.4 mm diameter pipe for fitting later in this build.





Test fit of engine:

Before continuing with the engine changes, the engine needs to be test fitted into the fairing/ radiator housing and support struts. This is necessary to ensure the changes made to the engine thus far will allow the engine to seat correctly in the structure.

Dry fit the engine support struts into the fuselage locations and hold the fairing/radiator assembly under the photo-etch engine bearers.

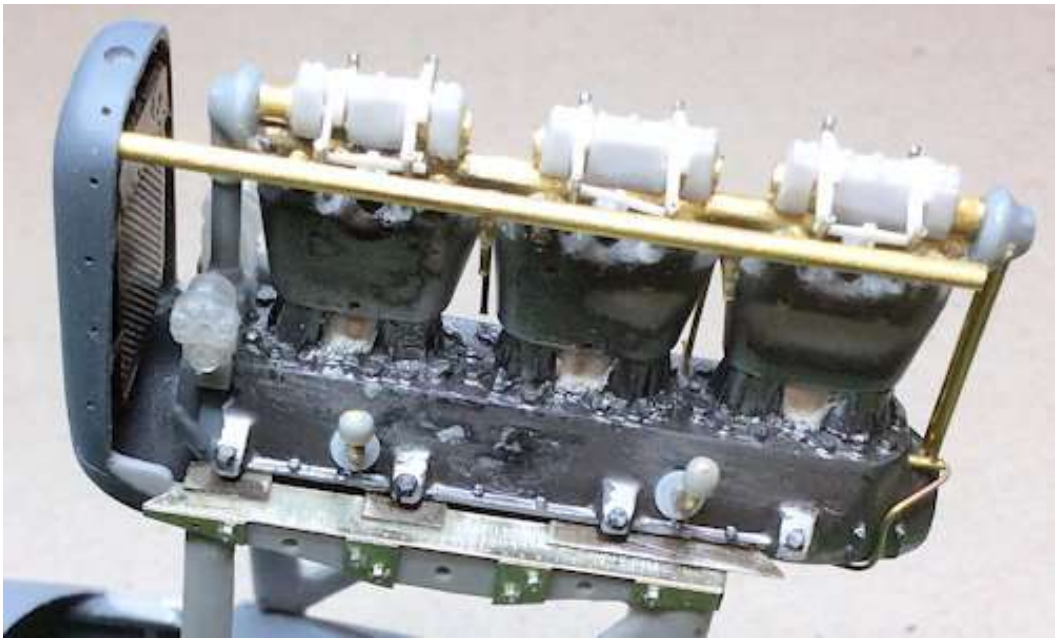
Locate the engine assembly onto the top of the photo-etch bearers and check if the inner edges of the bearers/plates are under the mounting lugs on the engine.

Check that the top of the engine is just below the top of the radiator housing and that the coolant return pipe is in the radiator recess of the housing.

NOTE: *If the top of the engine is not below the top of the radiator housing or the coolant return pipe is not in the radiator recess of the housing, then carry out the following procedure to the under tray to allow the engine to sit lower in the assembly.*

Carefully scrape, file or sand away the top edges of the undertray then repeat the above checks. Repeat this until the top of the engine and the coolant return pipe sit correctly to the radiator housing.

NOTE: *You may find that achieve a good fit, even more resin removal may be required from the engine sump and outer sides of the under tray.*

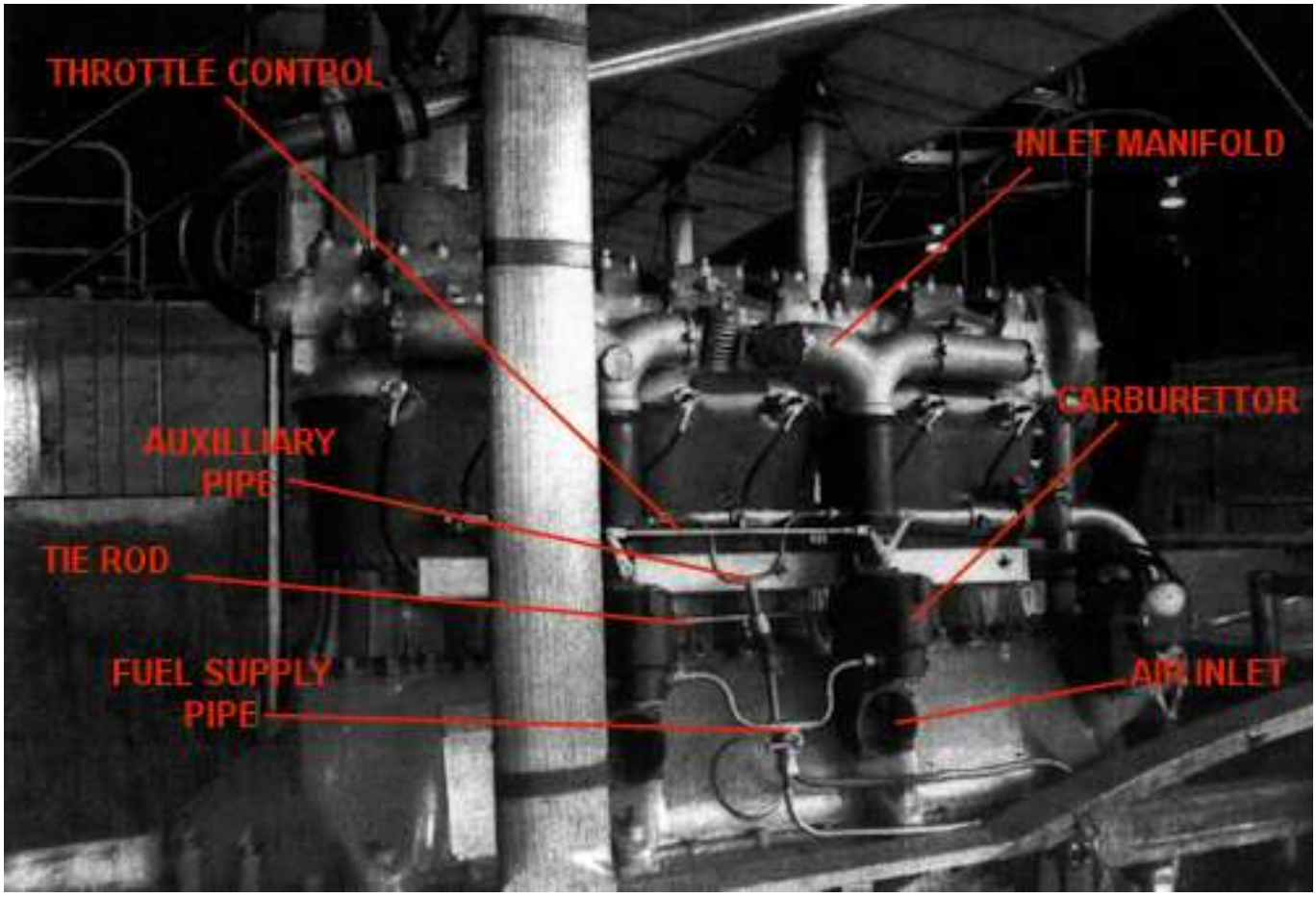


Fuel system:

The engine was fitted with two separate carburettors, located on one side of the engine and half way down the crank case. Each carburettor was connected to its inlet manifold, which in turn was connected to one end cylinder bank and one end of the centre cylinder bank. The two carburettors were interconnected by:

A throttle control rod, which was operated from the pilot's throttle controls.
A fuel supply pipe fitted with a manual shut-off cock.
An auxiliary pipe, the function of which is unclear - possibly fuel priming.
What appears to be possibly a tie-rod.

Fuel was supplied to both carburettors where it was mixed with air flowing in through the carburettor air intakes. The fuel/air mixture was control by the throttle control to the two carburettors. The fuel/air mixture travelled up the intake manifolds and into the ignition chambers of each cylinder bank, where it was ignited by the ignition spark plugs, which were control by the magnetos. The duration of the mixture burn was controlled by the opening and closing of the inlet and exhaust valves in each cylinder. The burnt gases exited each cylinder bank through its exhaust pipes.



As the kit supplied engine components are either incorrect or missing all together, modification to the following is required to make the components represent the actual engine.

The two carburettors need to be separated.
The two carburettors need air intake openings.
The two inlet manifold pipes need to be modified.
The photo-etch supplied throttle linkage needs to be modified.
Additional pipes need to be 'scratch' made.

NOTE: *The red lines on the following photograph show where cuts were made to modify both of the assemblies.*

Cut the vertical drop pipes away from the three ported header pipes.

NOTE: *The following step is necessary only if the three ported header pipes do not align with the ports on the cylinder heads.*

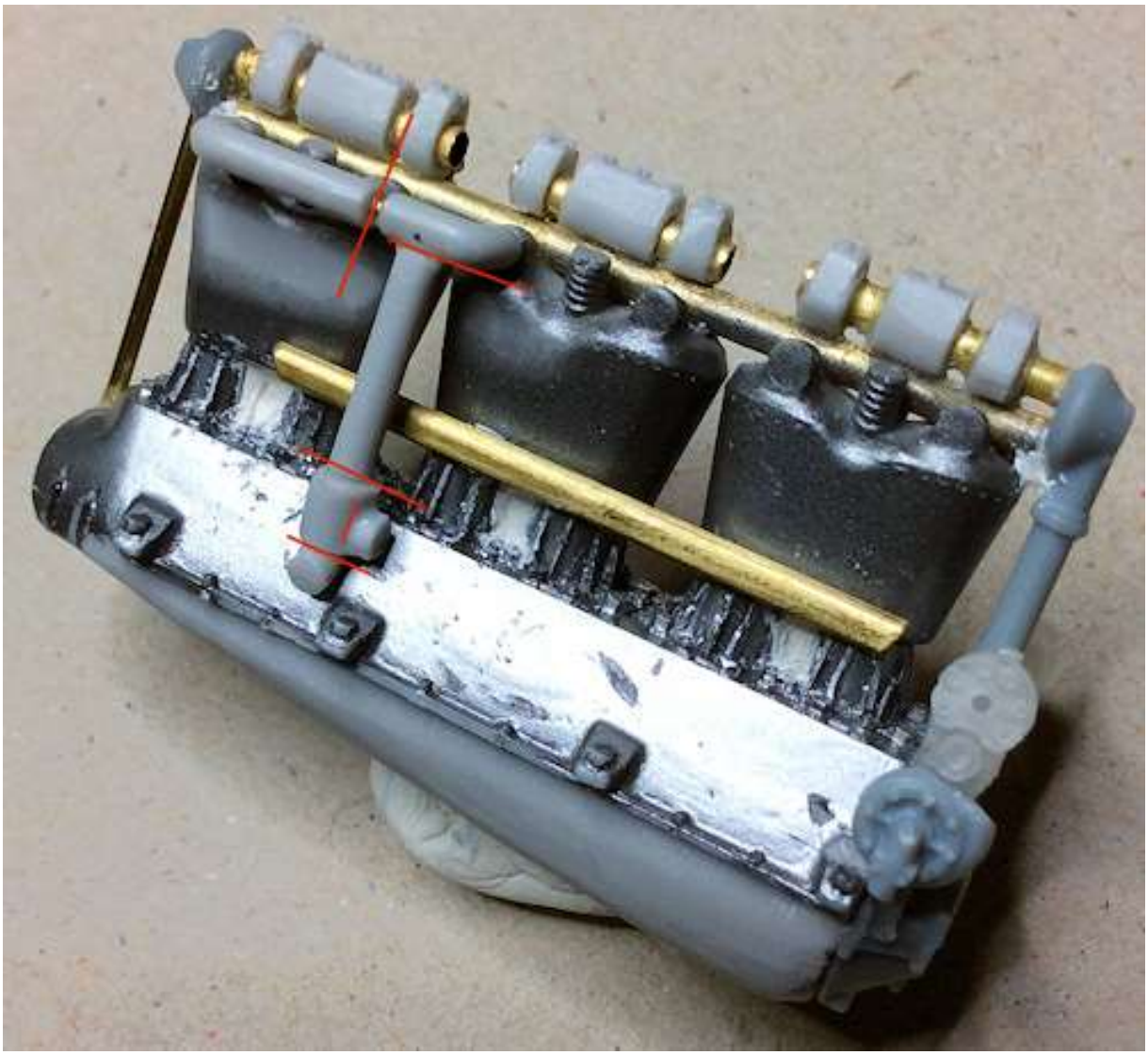
Cut the three ported header pipes and extend/shorten them as required, then drill a 0.5 mm diameter hole into both cut ends and insert a 0.5 mm diameter pin, secured with thin CA adhesive. The three ports should be aligned correctly with the cylinder heads.

The vertical drop pipes were shortened and had a 0.5 mm diameter pin inserted in the tops, which were then inserted into a hole drilled in the underside of the extended three ported header pipes and secured using thin CA adhesive. This was done to correctly align the drop pipes to between the cylinder banks.

The joined kit carburettors were separated and the side extensions cut away. Each was attached to the bottom of the drop pipes with 0.5 mm pin, secured with thin CA adhesive.

Finally the 90 degree bend that was cut away from the bottom of the drop pipes were cut and sanded back, to create the air intakes under the carburettors. The intakes were secured in position using CA adhesive.

The photograph below shows one of the assemblies test fitted but not completed (red lines indicate cut lines).

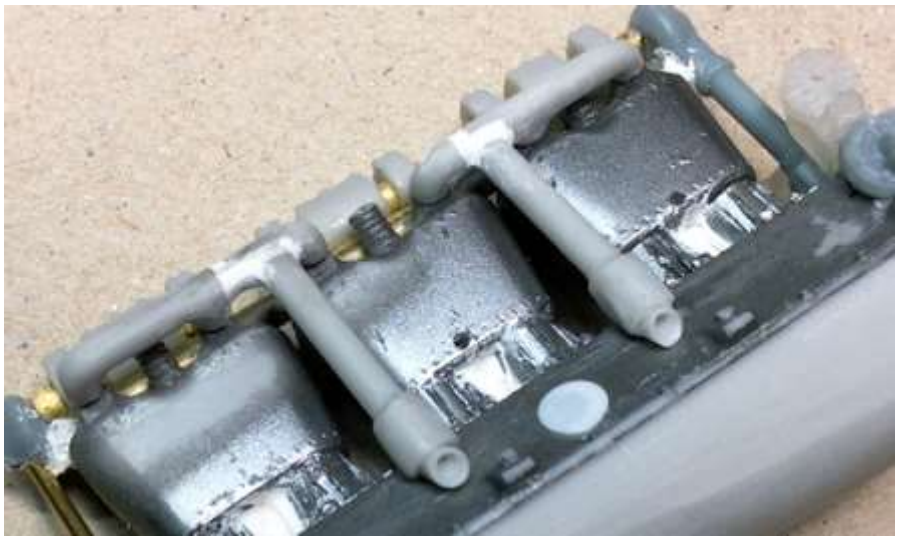


Using a modelling putty to fill any gaps etc and sand smooth once it has fully cured.

NOTE: *During the next step make sure you drill in the centre of the carburettor air intake and take care not to drill out too large or the resin may break away at the edges.*

Hollow out the carburettor air intakes by carefully drilling up in at an angle. Start with a small drill (e.g. 0.5 mm diameter) and gradually increase the drill sizes.

Using 'RB Motion' Aluminium Nuts Hex 0.79mm (1281-A), secure three nuts on each of the three ported header pipes using thin CA adhesive.

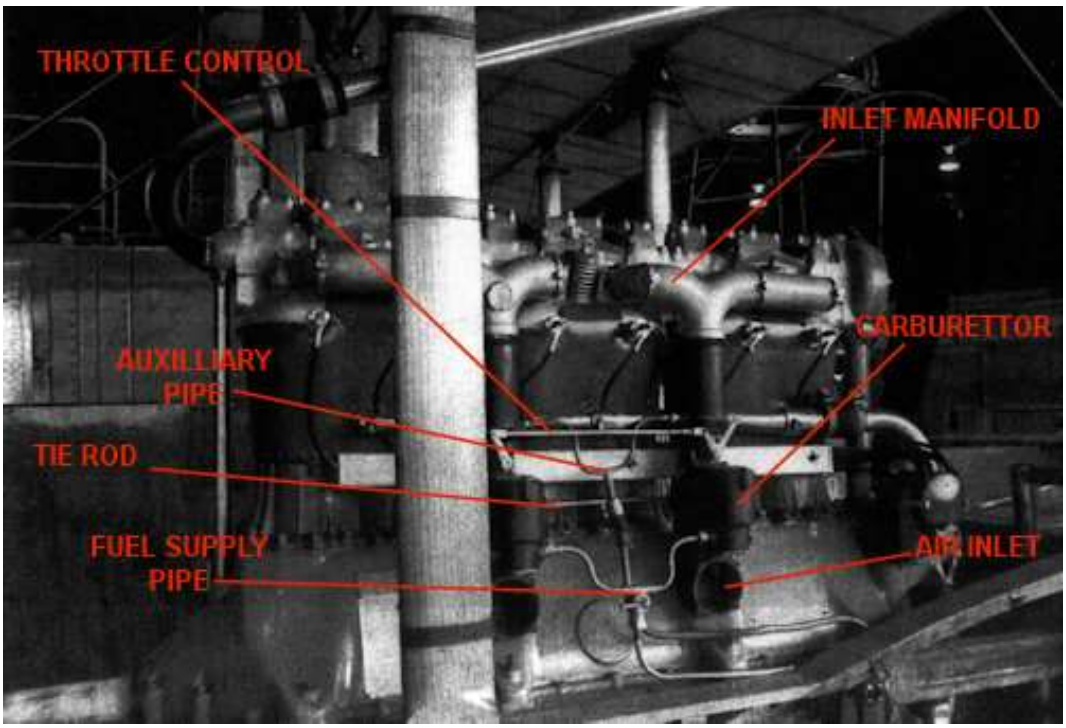


Engine controls and pipes:

NOTE 1: *The following 'scratch' made parts can only be fitted when the carburettors/induction manifolds have been finally fitted to the engine:*

The aircraft pipe to the fuel supply pipe between the intake manifolds.
The aircraft pipe to the auxiliary pipe connected between the intake manifolds.
The throttle controls between the two carburettors.
The tie rod connected between the intake manifolds.

NOTE 2: *For the next steps, refer to the following photograph for guidance.*



Temporarily locate the two carburettor/induction pipe assemblies on the engine.

Cut two short lengths of wood tooth pick and attach them to the carburettor bodies using CA adhesive. These represent what I believe are possibly the carburettor float chambers.

Use the kit supplied photo-etch parts 4 are not called up for use in the instructions. Use them as tops to the installed float chambers.

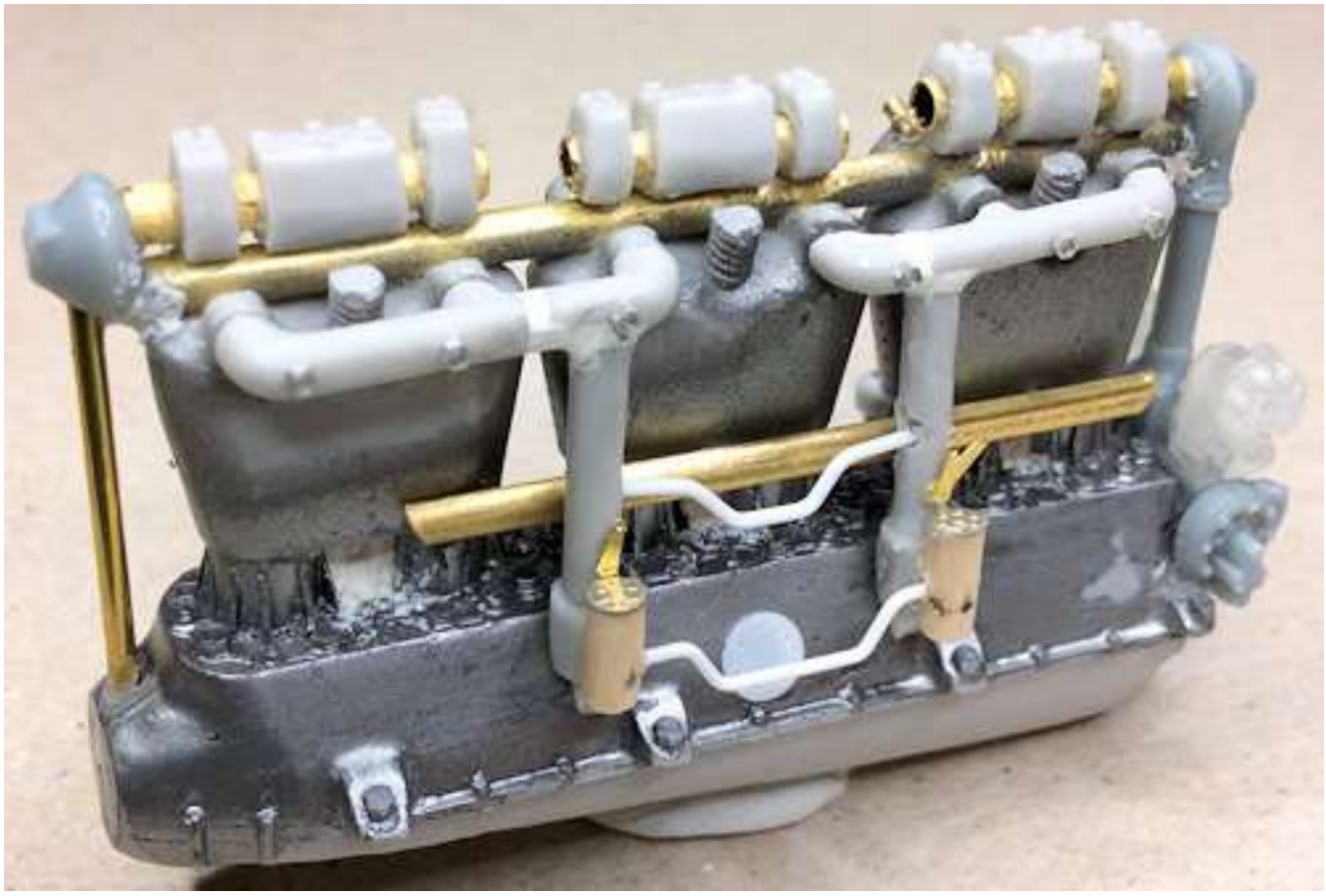
Mark the position on the inboard sides of the induction manifold and the added float chambers where the fuel supply and auxiliary pipes locate.

Using the marks as a guide, drill a hole of 0.6 mm diameter into (but not through) the inboard sides of the induction manifold and the added float chambers.

Cut two lengths of 0.5 mm diameter plastic rod.

Bend the rods to the shape of the upper section of the fuel supply and auxiliary pipes, making sure enough is left at each end for locating into the pre-drilled holes.

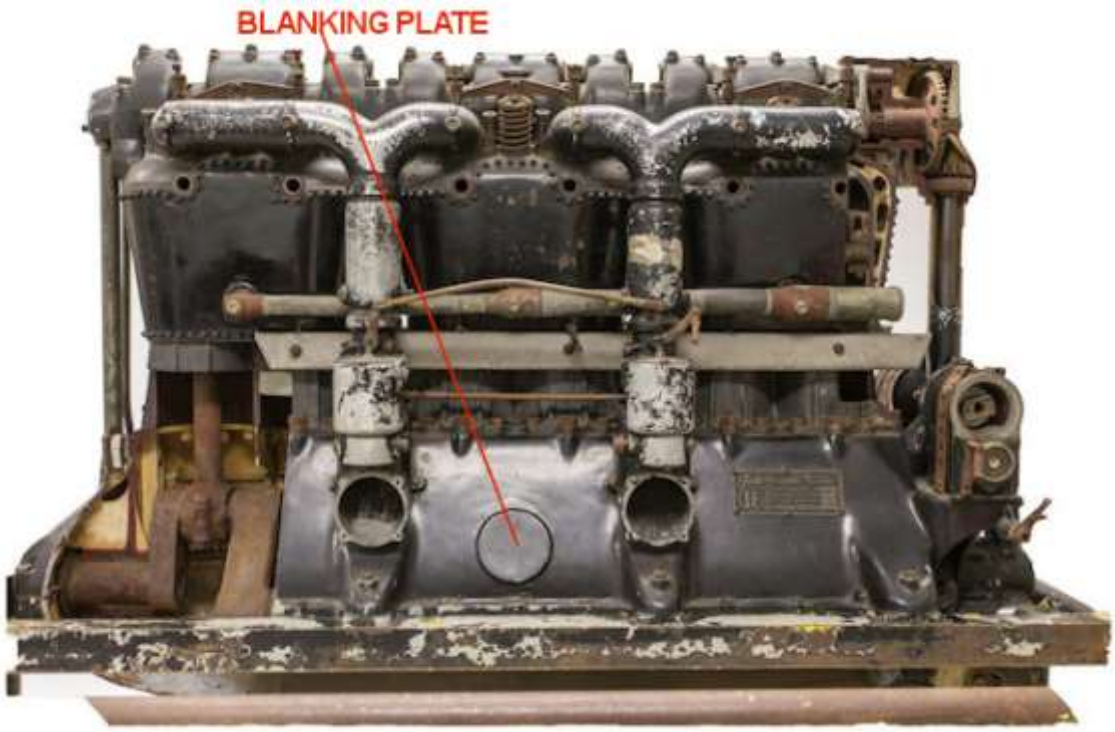
Select appropriately sized control horns from the ‘Part’ WWI control horns and turnbuckles set (S48087) and attach one to the induction pipe of the left assembly and two to the right assembly. These will be used for the carburettor control rods.

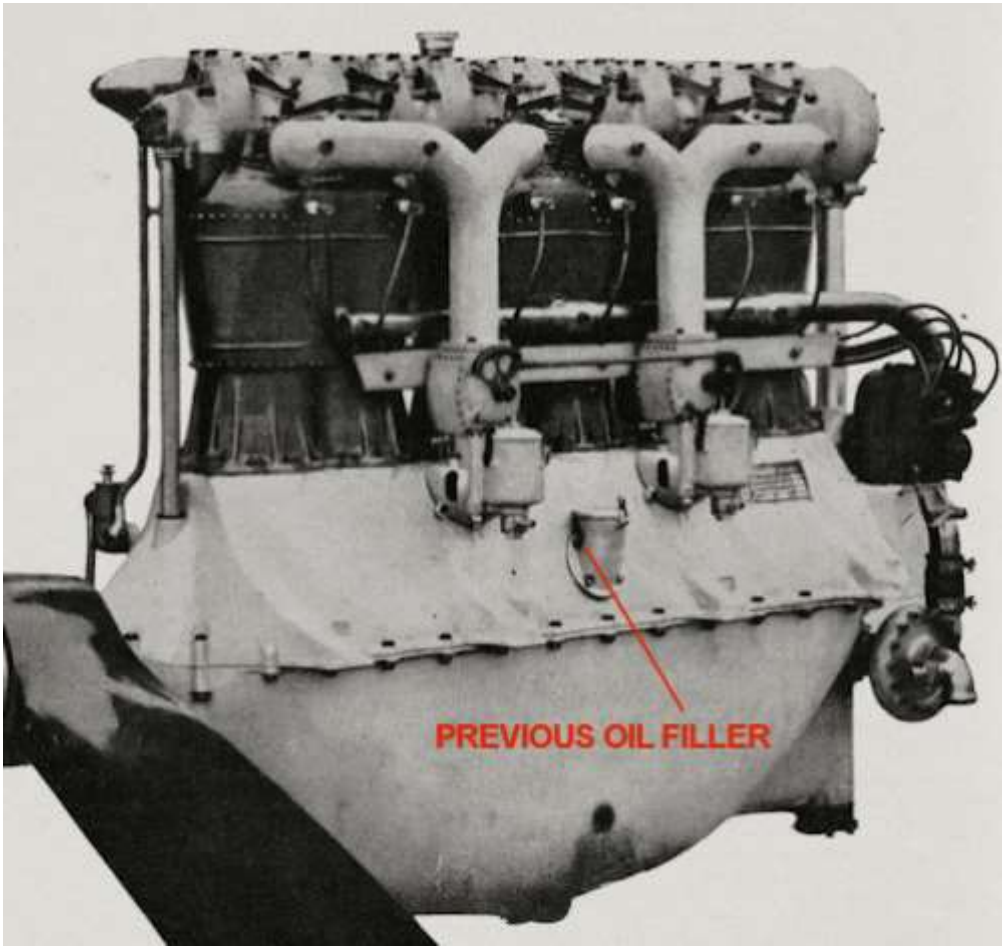


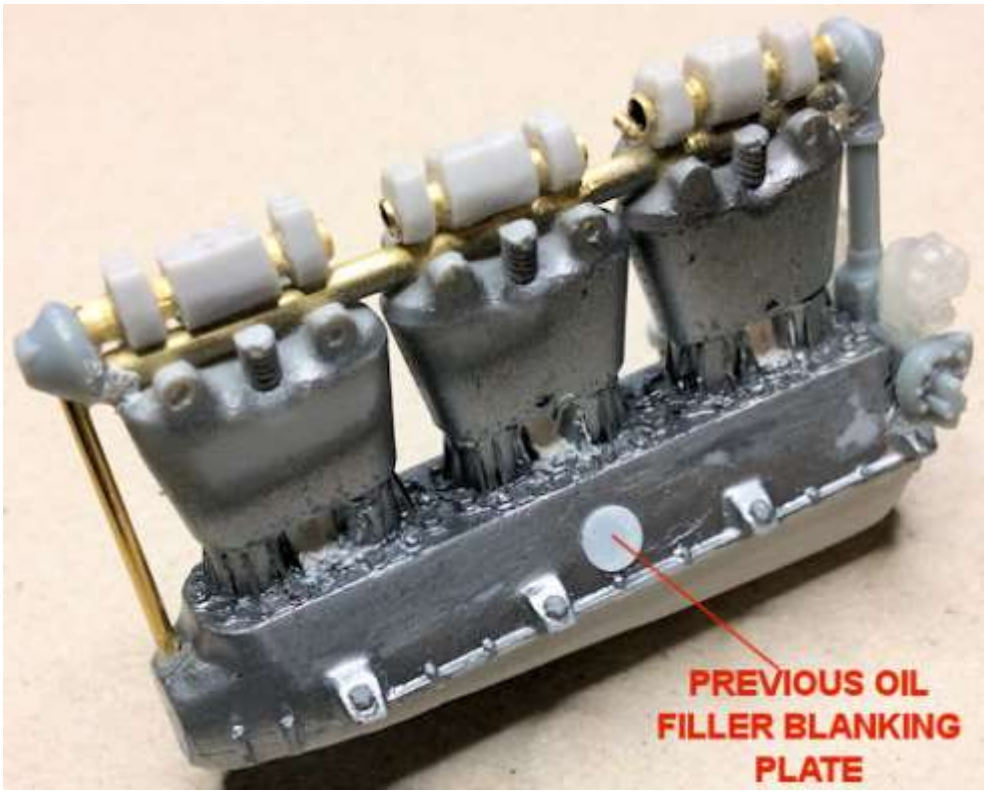
Blanking plate:

On the side of the engine crank case and between the two carburettors is a blanking plate. I believe this plate was fitted to seal what was previously the oil filler pipe for the engine sump, but not used on this version of the engine.

To represent this blanking plate, cut a disc of approximately 2.5 mm diameter from 0.2 mm thick plastic card and secure it in position on the sump using thin CA adhesive.

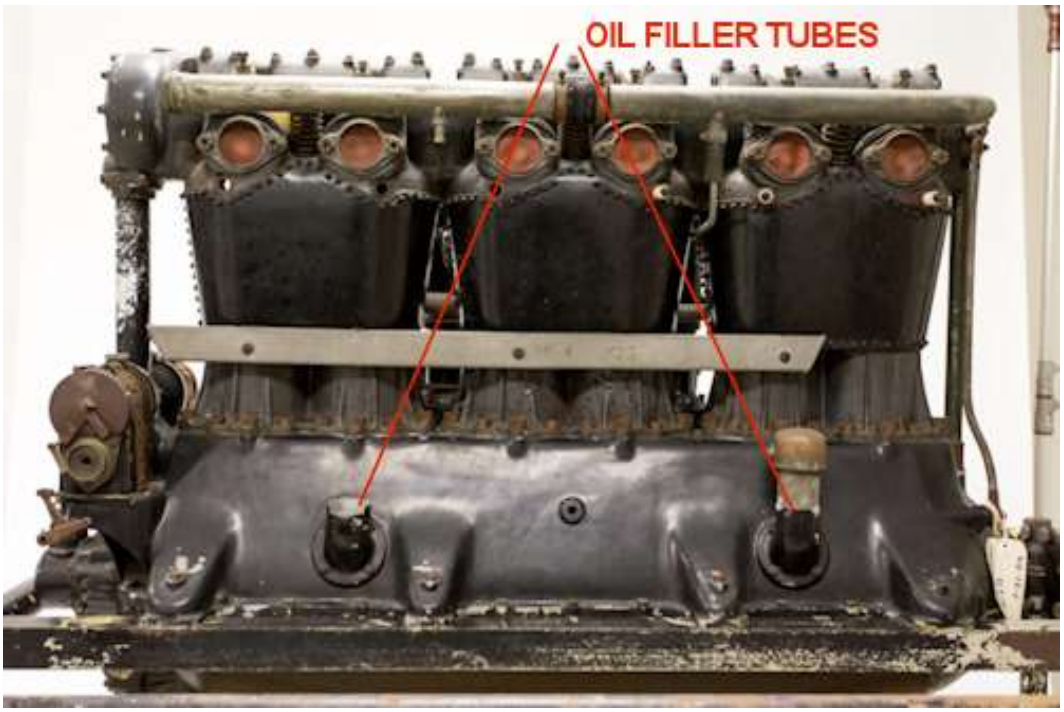






Oil filler pipes:

Two oil filler pipes, which were used to replenish oil in the engine sump, were located on the engine crank case on one side of the engine. Each was fitted with a cap.



To represent the two oil filler pipes:

Cut two discs of approximately 3.0 mm diameter from 0.2 mm thick plastic card and secure them in position (refer to the following photograph) on the engine sump using thin CA adhesive.

Drill two 1.3 mm diameter holes through the centre of both discs. Start with a small drill and gradually step up to the final 1.3 mm drill.

Anneal a length of 1.2 mm diameter brass tube (e.g. ‘Albion Alloy’s MBT12 or similar).

Insert a length of 0.8 mm diameter rod (e.g. ‘Albion Alloy’s MBR08 or similar).

Bend the combined tubes so that the outer tube would be vertical when it is added to the angled side of the engine crank case.

Roll cut around the outer tube to leave the internal rod protruding from one end by approximately 5 mm.

Roll cut through the other end of the combined tubes leaving approximately 5 mm from the bend.

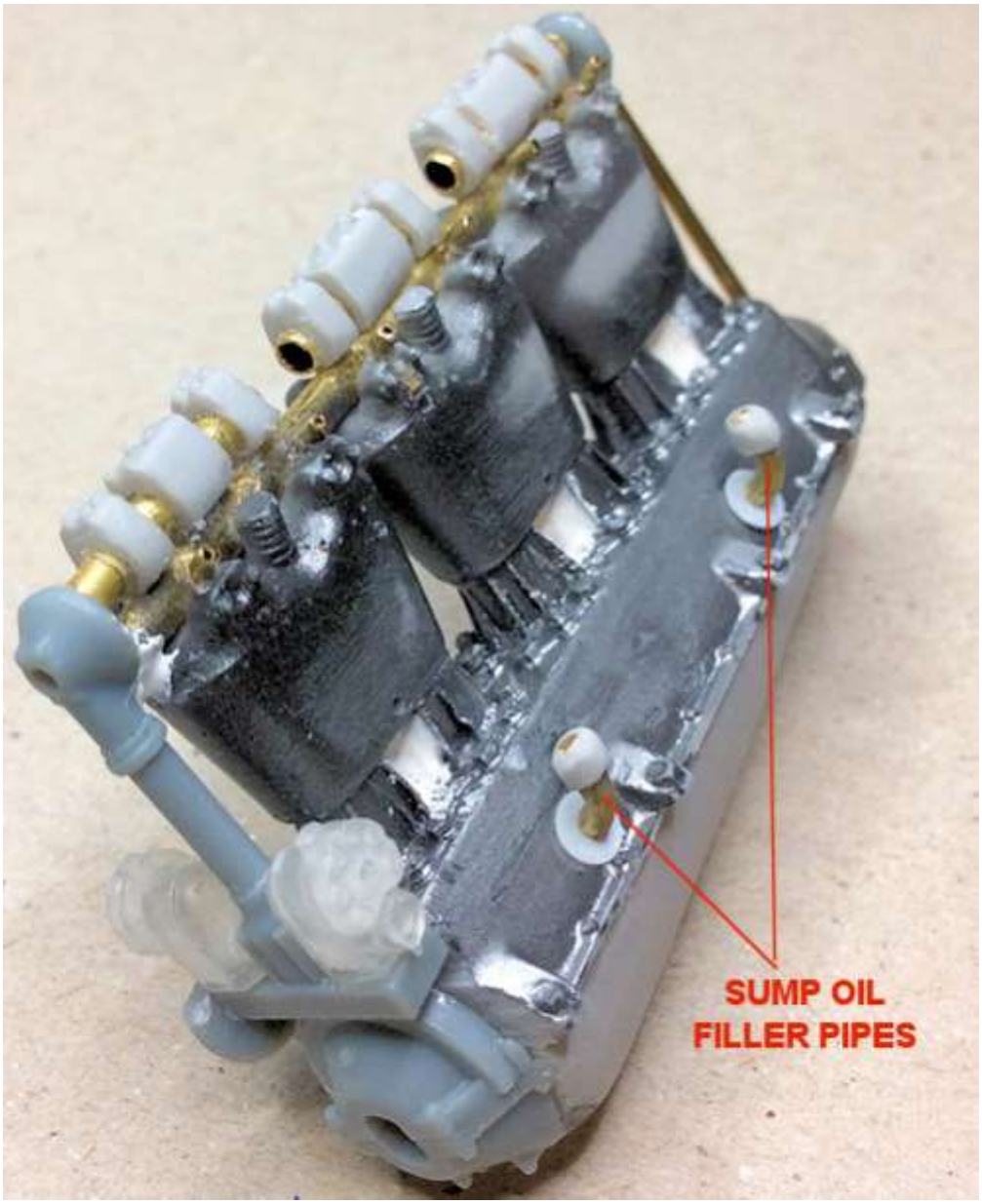
Using waste sprue or similar of approximately 2 mm diameter, cut two short lengths of 5 mm.

Drill a hole of 0.9 mm diameter through the centre of the two cut sprues.

Locate one cut sprue onto the 0.8 mm rod on the combined tubes and secure in position using thin CA adhesive.

File the top of the combined sprues/brass rod to reduce the height of the ’caps’ to 1.5 mm.

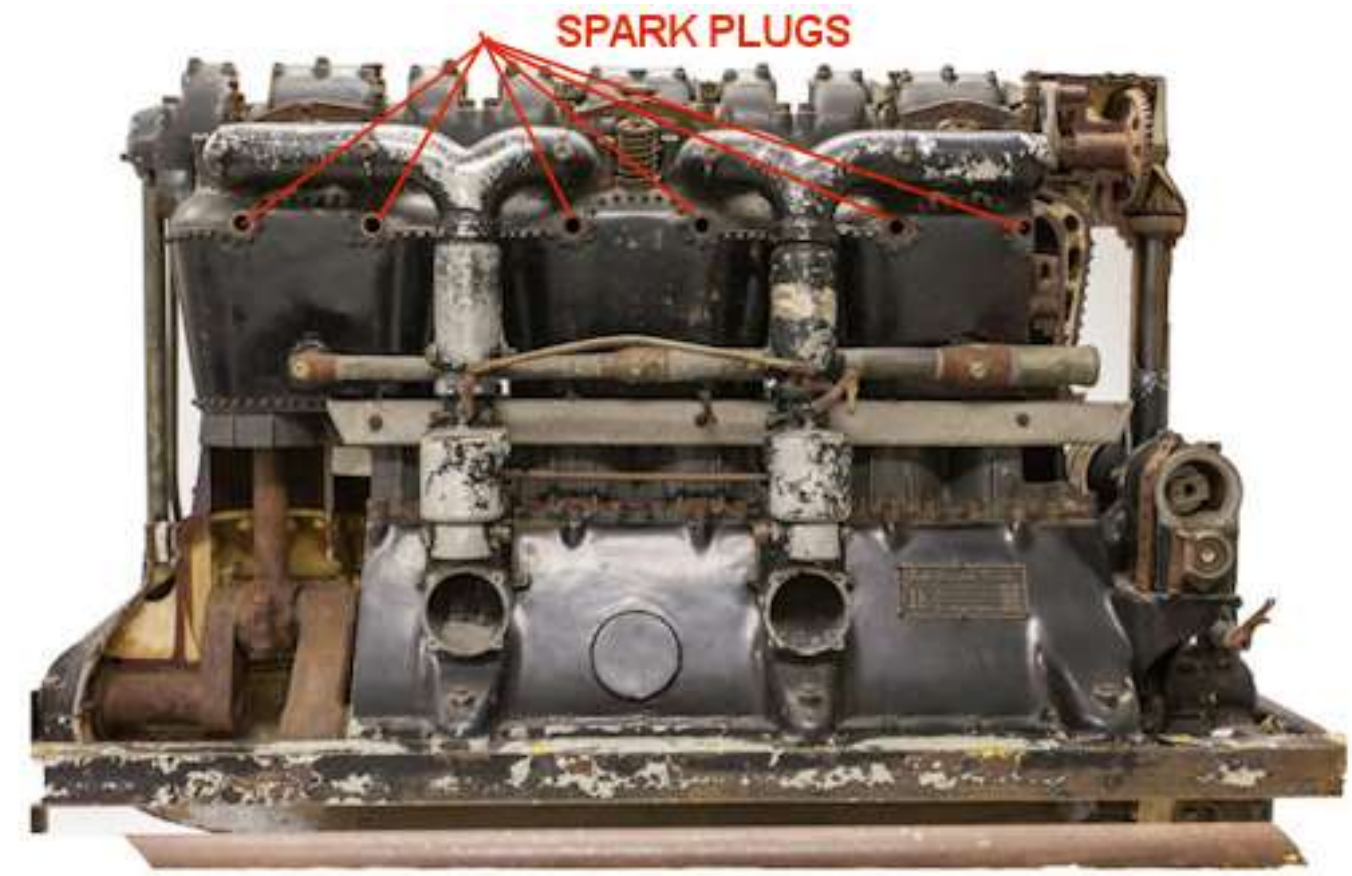
Insert each filler tube into the pre-drilled holes and secure them, vertically, in position using thin CA adhesive.

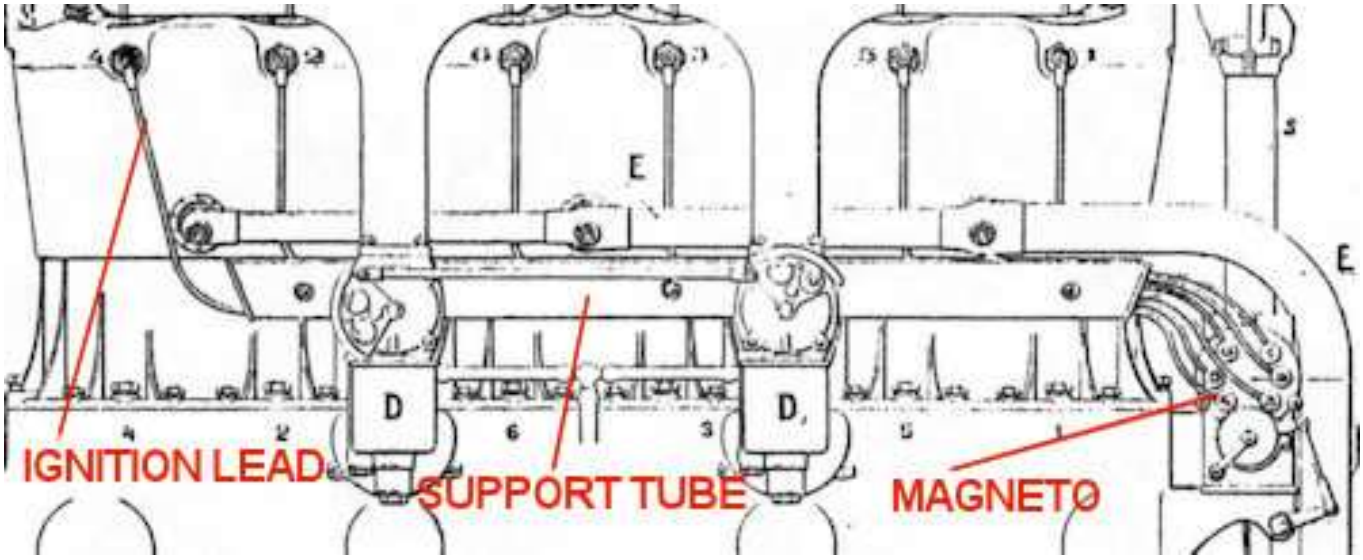


Spark plugs and ignition leads:

Each cylinder had a spark plug fitted at the top of the cylinder. The plugs were connected to the magneto on that side of the engine by the ignition leads. A total of 12 sparks plugs were fitted, six each side of the cylinders.

Twelve ignition leads (one for each side of each cylinder) were connected between the spark plugs and the two magnetos. The ignition leads were routed through and supported by the ignition support tubes.





NOTE: *The created spark plugs with ignition leads will be painted and fitted to the completed engine later in the build.*

Drill two holes of 0.6 mm diameter into, but not through, both sides of each cylinder bank. The holes should be close to the top of the cylinder bank and central to each individual cylinder.

Cut twelve short lengths of 0.5 mm diameter tube (e.g. ‘Albion Alloy’s’ or similar).

Cut twelve lengths of 0.3 mm diameter ‘PlusModel’ lead wire.

Slide onto each tube a ‘RB Motion’ Aluminium Nut Hex 0.79mm (1281-A).

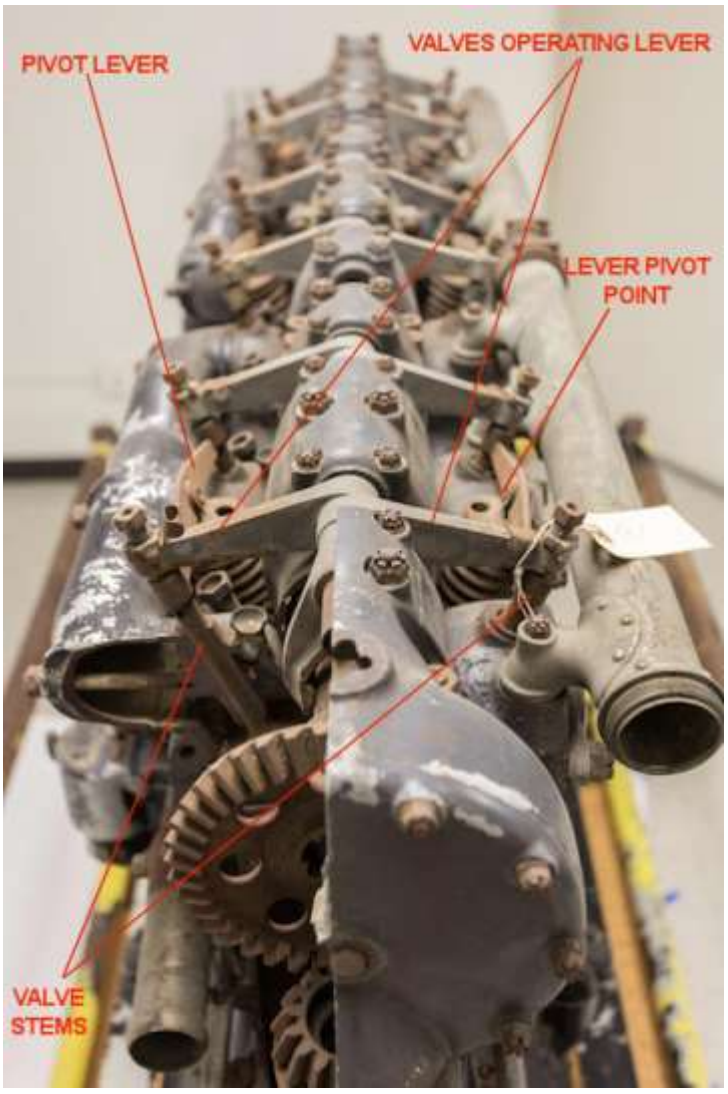
Insert a wire into the bore of each of the cut tubes and secure with thin CA adhesive.

Secure the nut on the tube and the wire in the tube with CA adhesive.

Prime then paint the tube from the nut to the wire with ‘Tamiya’ White (XF2) with a drop of Buff (XF57).

Valve operating gear:

The entry of the fuel and air mixture into each cylinder head and the expulsion of the burnt gases was controlled by the inlet and exhaust valves. The opening and closing of these valves was controlled by pivoting levers, the ends of which were connected to operating levers, which in turn were moved by cams on the cam shaft.
The kit supplied photo-etch is intended to represent the pivoting and operating levers only and does not look convincing.



To better represent the valve operating gear:

Materials used:

'Albion Alloy's' 0.5 mm diameter Nickel-Silver tube (NST05) -'RB Motion' Aluminium Nuts Hex 0.51mm (1279-A) - Plastic card of 0.5 mm thickness.

Drill a hole of 1.0 mm diameter through the 0.5 mm thick plastic card.

Open the hole up to 2.0 mm diameter.

Cut through the plastic card on one side of the drilled hole.

NOTE: *The end of the lever will need to be just inboard from the lugs at each side of the valve. This will allow fitting of the push rods etc. Cut the lever longer than required as the length of the lever will trimmed **after** the lever have been fitted to the engine.*

Cut the outside edges of the plastic card to form the shape of one operating lever.

Repeat to create a second operating lever.

Lightly sand both sides of the levers.

Position one lever onto the other with the holes aligned and the ends angled slightly downwards.

Secure the levers together with CA adhesive.

Test fit the lever assembly onto am overhead operating shaft. Make sure that the lever assembly is seated fully onto the shaft with the top at or just below the adjoining mounting blocks for the operating shaft.

If necessary, carefully sand the lever thickness if it won't fit in the gap at the operating shaft.

Repeat the procedure to create the remaining five lever assemblies.

Position the lever assemblies into their locations on the overhead shafts and secure in position using CA adhesive.

Cut twelve short lengths of 0.4 mm diameter tube (e.g. ‘Albion Alloy’s’ NST04 or similar). These are to represent the valve push rods.

NOTE: *When creating the valve push rods, work on them one at a time as the lengths and the positioning will vary for each push rod to its operating lever.*

Position a cut tube inline with the end of a lever and angled in at the bottom to the centre of the adjacent engine lug (exhaust or inlet manifold lugs).

If necessary, carefully cut away the side of the lug to allow the rod to be fitted vertical when viewed from the side of the engine.

Using a sharp pair of modelling cutters, carefully cut away the end of the lever so that the rod can be secured to the end of the lever and be angled inward at the bottom to the centre of the lug.

Cut the rod so that when fitted the top of the rod is level with the top of the lever and in contact at the bottom with the engine.

Secure the rod in position using CA adhesive.

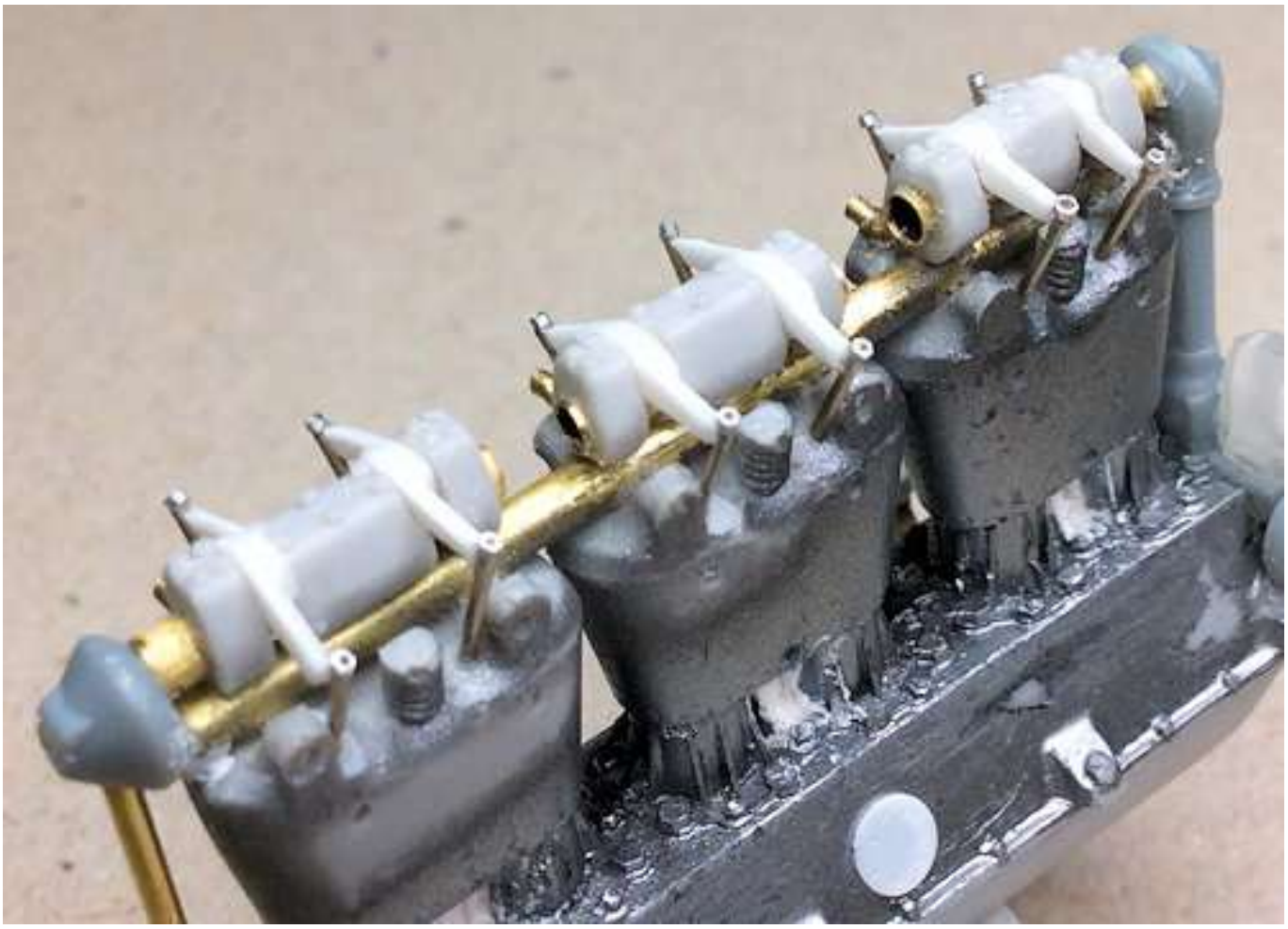
Repeat this procedure for the remaining eleven push rods.

Mark the engine where the bottom of each rod rests.

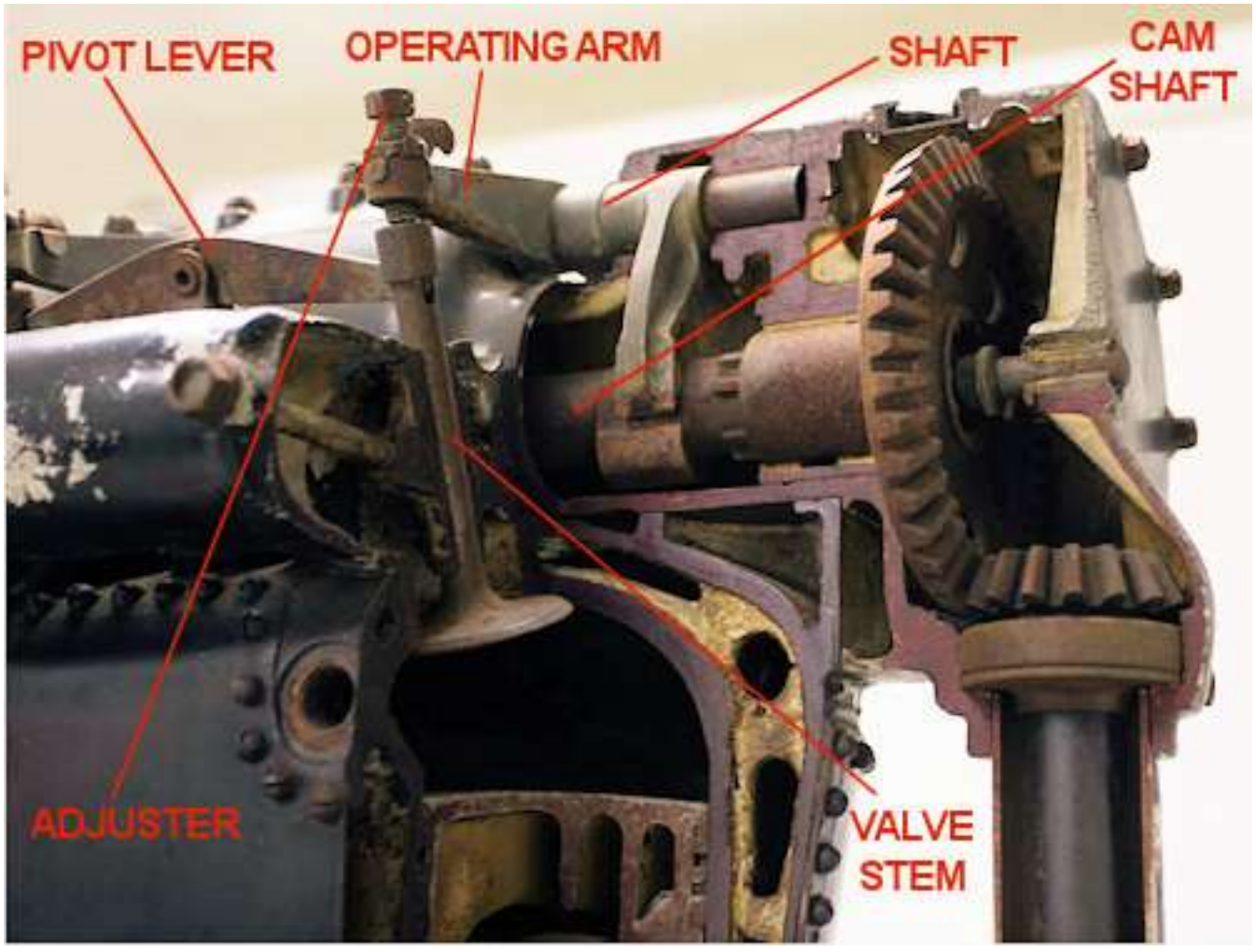
Drill a hole of 0.6 mm diameter into the engine and at the same angle as for the rod.

Secure each rod into its location using CA adhesive. Leave the top of the rods just clear of the top of the levers.

Secure a ‘RB Motion’ Aluminium Nut Hex 0.51 mm (1279-A) onto the top of each rod, using CA adhesive.



Each pair of valve push rods were connected together on each side of the engine by a pivoting lever, the ends of which were moved down into the engine (valve open) by the operating levers. The centre of the pivot lever was attached to the valve to allow the lever to pivot and move the valves. The valve spring damped out oscillations in valve movement.



To represent these pivot levers:

Using 0.2 mm thick plastic card, cut a strip 1.0 mm wide.

Cut the strip into six lengths equal to the span between the valve push rods.

Slightly chamfer one edge each side from the centre to create six pivot levers.

Cut a strip of 0.2 mm thick plastic card 0.5 mm wide.

Cut the strip into six short lengths.

NOTE: *If the tops of the installed push rods are not level, angle 0.5 mm cut strip when securing on the pivot lever. This in fact can represent the angle the levers would sit at, depending on whether the valves are closed or open.*

Secure a short strip at the centre of each pivot lever.

Offer up an assembly against a pair of push rods and trim as required so that the lever sits on top of the valve spring and against the rear of the two push rods.

Repeat for the remaining five assemblies.

Add a drop of CA adhesive to the top of a valve spring and carefully position the bottom of the 0.5 mm cut strip of the pivot lever onto the valve spring with the two ends of the lever against the rear of the two push rods.

Add CA adhesive to where the pivot lever touches the push rods.

Repeat for the remaining five pivot lever assemblies.

Test Fit:

At this stage of the engine modifications, it's best to dry fit the following parts to ensure they locate correctly and don't foul each other:

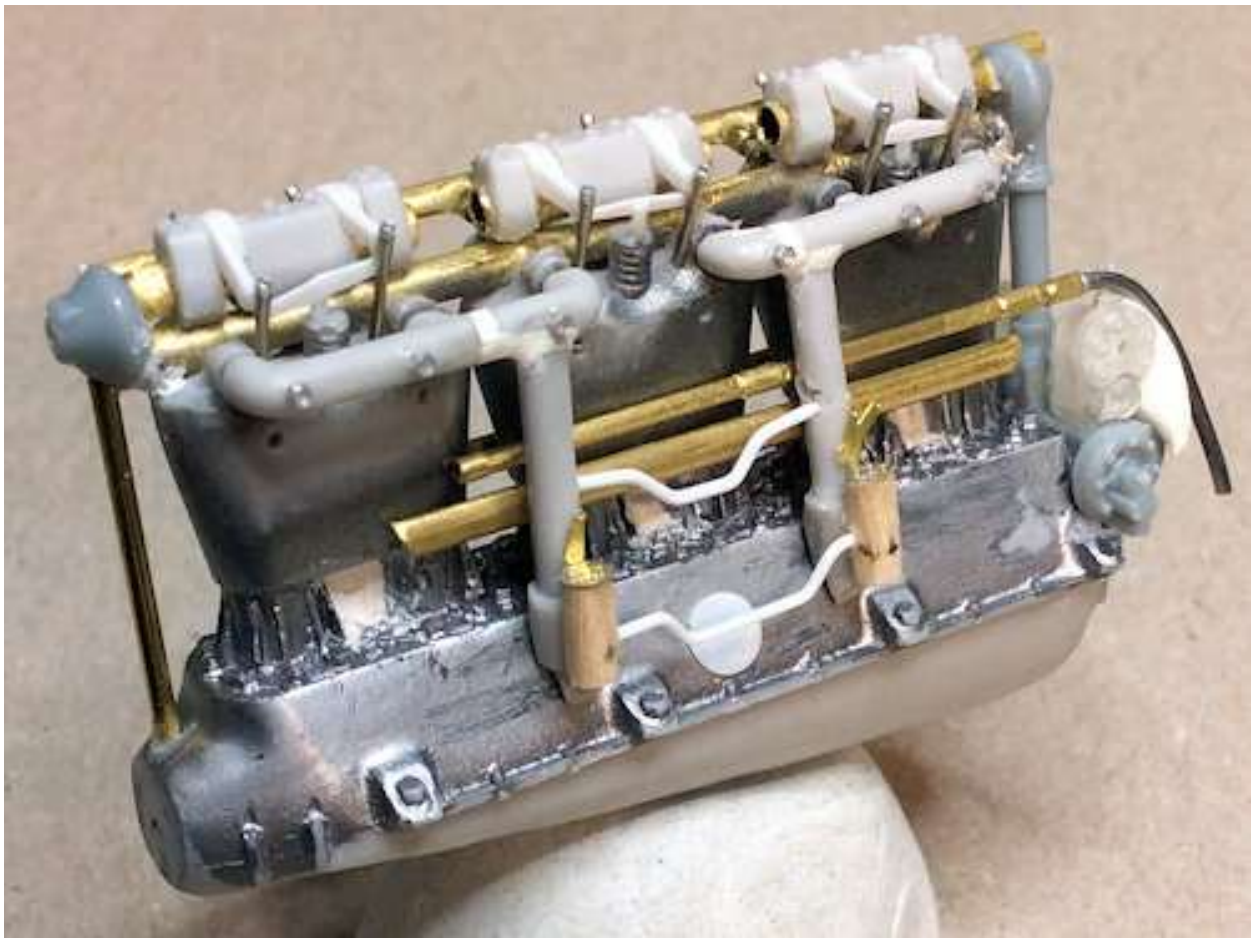
Ignition support tubes (both sides of the engine)

Carburettor and induction manifold assemblies (both sides of the engine)

Coolant supply pipe to the bottom of the cylinder banks (one side of the engine)

Coolant return pipe from the top of the cylinder banks (opposite side of the engine)

Two carburettor interconnecting pipes.

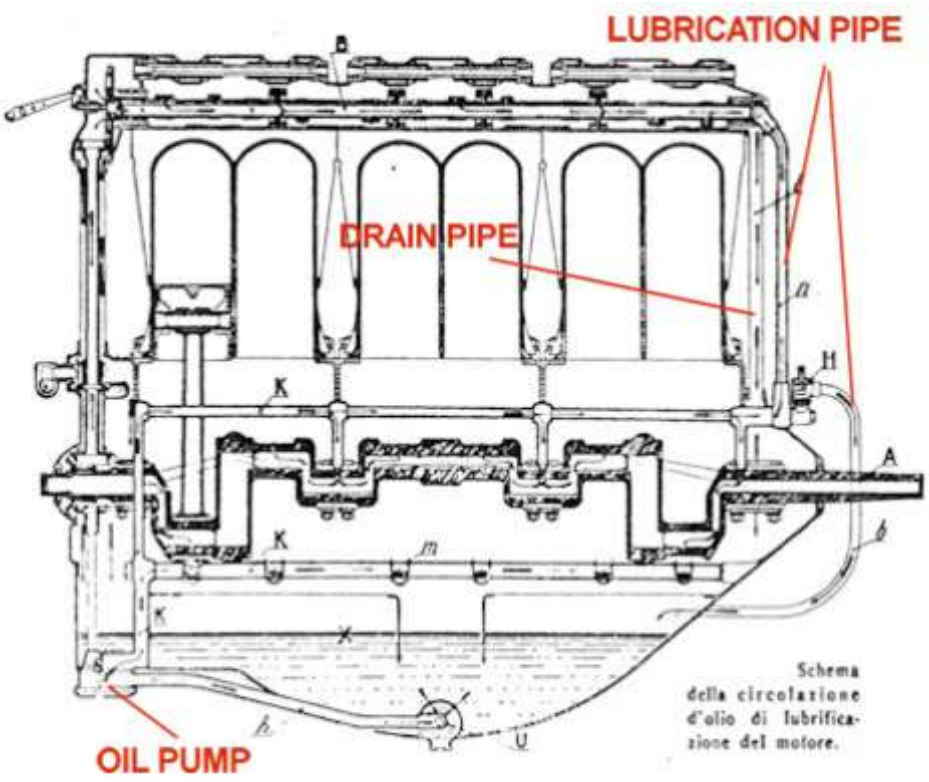


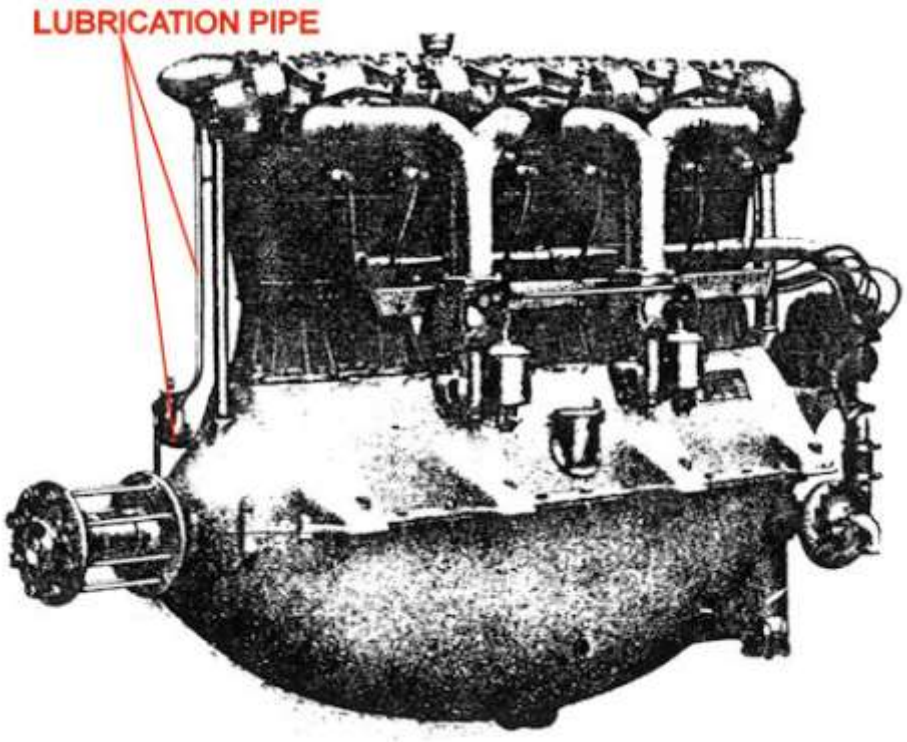
External oil pipes:

The engine oil pump was located below the water pump at the lower, rear of the engine.

Visible pipes for the model:

Oil was drawn from the engine oil sump by the oil pump and supplied internally to the crank shaft bearings and out into an external oil supply pipe. A pipe was connected at the propeller end of the engine, between the housing of the cam shaft and the engine crank case. This pipe supplied oil vertically up to the cam shaft and used oil drained back down into the sump through an adjacent external pipe and sump return pipe. No other oil pipes will be visible on the engine model and so were not created.





To represent the oil pipes (refer to the photograph below):

Drill a hole into the engine crank case of 0.8 mm diameter.

Drill a hole into the cam shaft housing of 0.5 mm diameter.

Cut a short length of 0.7 mm diameter tube (e.g. ‘Albion Alloy’s MBT07 or similar).

Drill a hole into through one side of the tube of 0.5 mm diameter.

Cut two lengths of 0.4 mm diameter tube (e.g. ‘Albion Alloy’s MBT04 or similar).

Insert the 0.7 mm diameter tube into the pre-drilled 0.8 mm diameter hole.

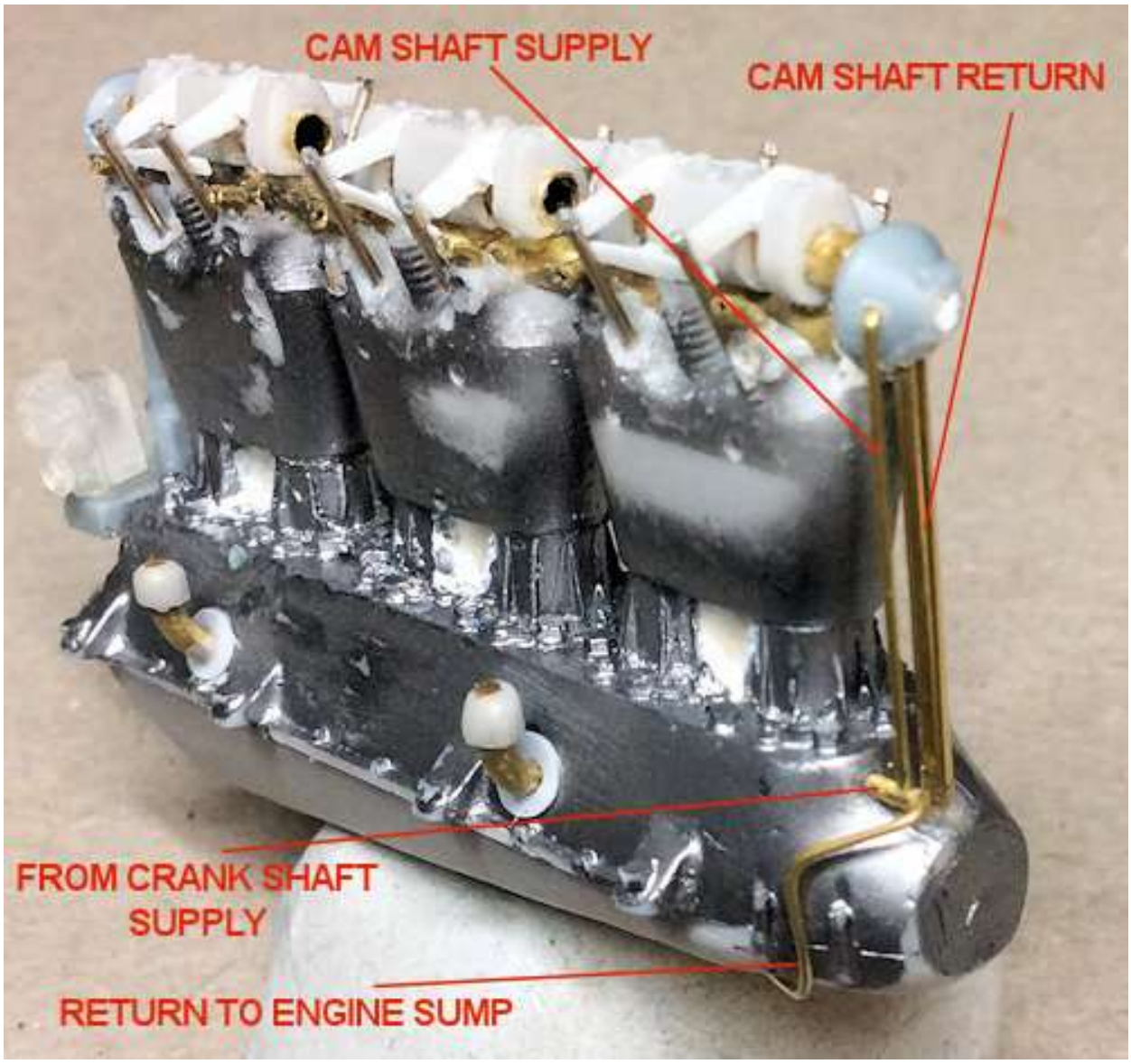
Bend one end of a 0.4 mm diameter tube to 90 degrees and trim its length so that it locates in the hole in the crank case pipe and the hole in the cam shaft housing.

Secure in position using thin CA adhesive.

Bend the end of the second 0.4 mm diameter tube to more than 90 degrees and insert it into the end of the crank shaft pipe.

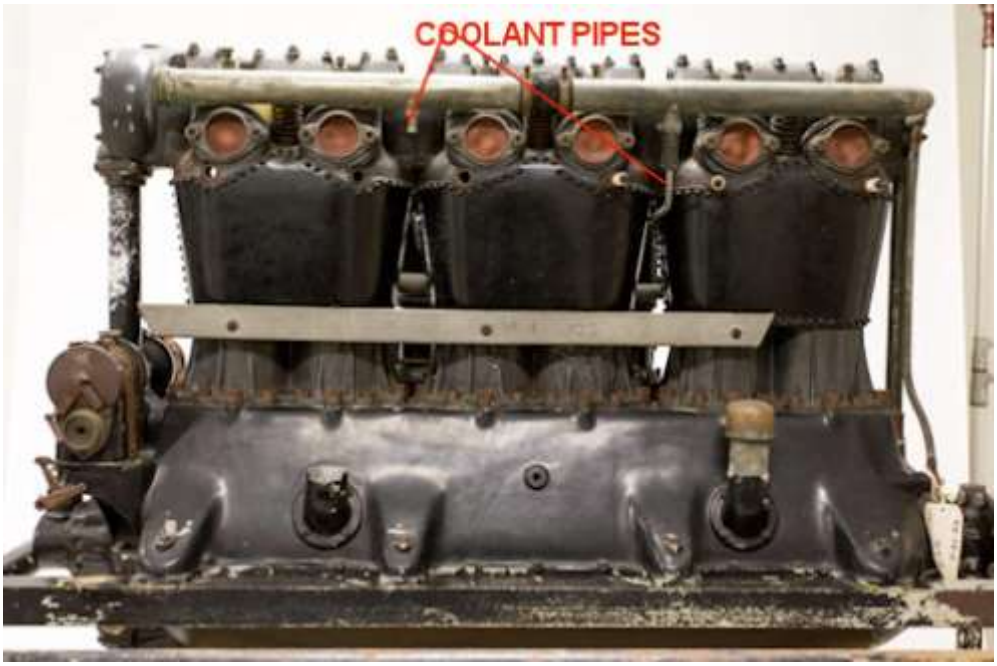
Bend the pipe (as in the photograph) so it routes to under the engine sump.

Secure in position using thin CA adhesive.



Carburettor pre-heat pipes:

Two pipes were connected to the underside of the coolant return pipe, located at the top of the engine. The two pipes were routed across to the other side of the engine, between the end and centre cylinder banks. The purpose for these two pipes is not clear or to where on the engine they were eventually connected. As the pipes were connected to the coolant return pipe, it would seem hot coolant from the engine was carried in the pipes. My only assumption is that these pipes supplied hot coolant to the housings of the two carburettors, thereby 'pre-heating' both of the carburettors and preventing icing up, which may have been more of a problem for seaplanes more than land based aircraft.



To represent the two coolant pipes:

Dry fit the coolant return pipe onto the installed pipe connectors on the engine.

Dry fit the two carburettor and induction manifold assemblies to the engine.

Mark the location of the two supply pipes on the underside of the return pipe.

At the marks, drill a hole of 0.9 mm diameter into, but not through, the return pipe.

Cut two short lengths of 0.8 mm diameter tube (e.g. 'Albion Alloy's' MBT08 or similar).

Insert the cut tubes into the pre-drilled holes and secure in position with CA adhesive.

Cut two lengths of 0.5 mm diameter tube (e.g. 'Albion Alloy's' MBT05 or similar).

Bend these tubes so that they can be inserted into the two 0.8 mm diameter tubes and pass between the centre and end cylinder banks (refer to the previous photograph). Make sure the ends of the pipes contact the rear of the carburettor housings.

Secure the pipes into the 0.8 mm tubes with CA adhesive.

Carefully remove the return pipe assembly.

Remove the two carburettor and induction manifold assemblies.

Drill a hole of 0.6 mm diameter into the top, rear of each carburettor housing.

Cut a length of 0.5 mm diameter tube (e.g. 'Albion Alloy's' MBT05 or similar).

Bend one end of the cut tube to 90 degrees and insert it into one the pre-drilled holes in the carburettor housings and secure it in position with CA adhesive. Make sure the tube is at 90 degrees to the induction manifold.

Dry fit the two carburettor and induction manifold assemblies to the engine.

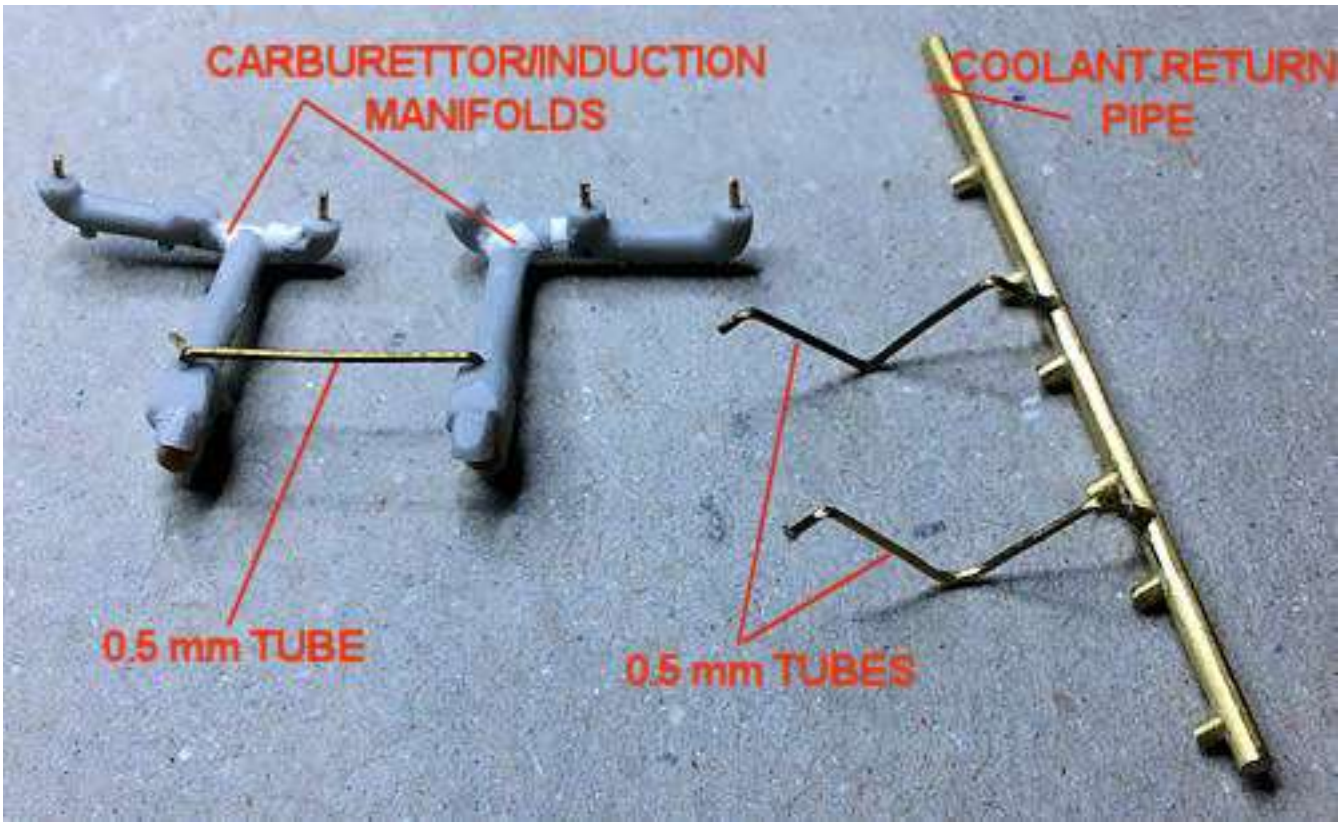
Note where the unbent end of the 0.5 mm tube is to the pre-drilled hole in the opposite carburettor housing.

Cut then bend this end of the 0.5 mm tube so that it will fit into the pre-drilled hole in that carburettor housing.

Carefully remove both carburettor and induction manifold assemblies.

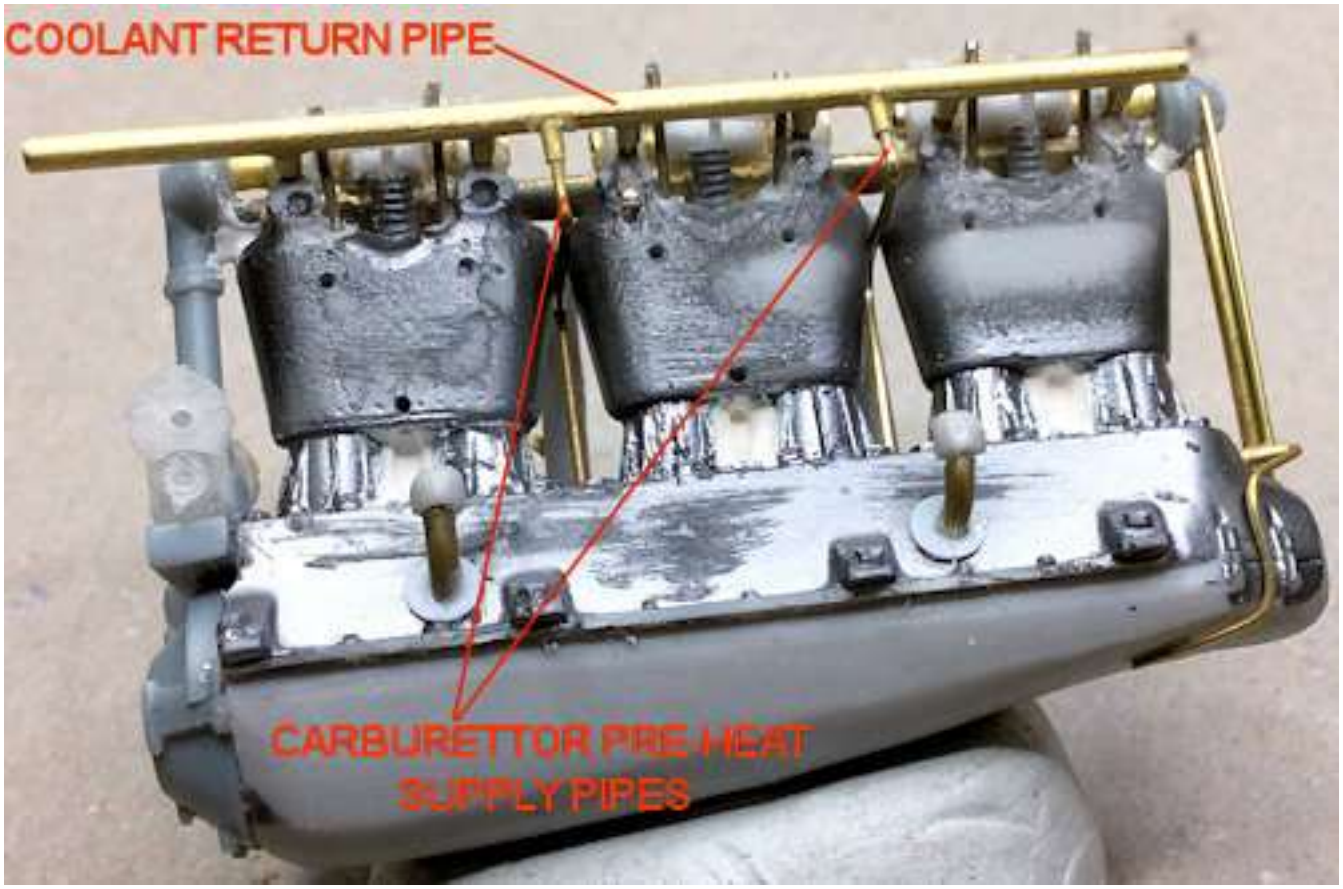
Insert the bent end of the 0.5 mm tube into the second pre-drilled hole. Make sure both induction manifolds are parallel and the 0.5 mm tube is at 90 degrees to both.

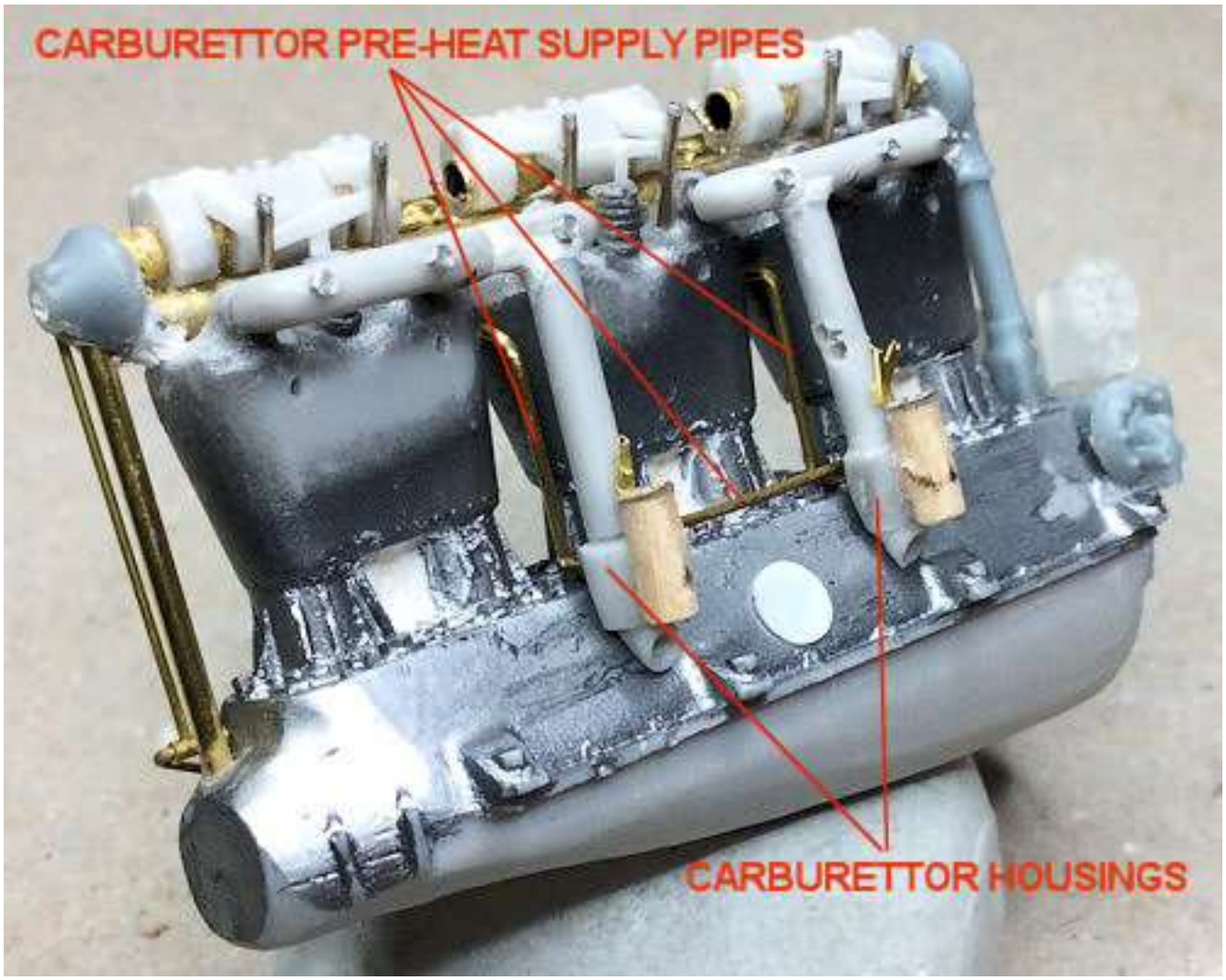
Secure the 0.5 mm tube in position with CA adhesive.



Check fit the coolant return pipe and both carburettor and induction manifold assemblies to the engine.

Carefully remove the coolant return pipe and both carburettor and induction manifold assemblies from the engine.


COOLANT RETURN PIPE
CARBURETTOR PRE-HEAT
SUPPLY PIPES


CARBURETTOR PRE-HEAT SUPPLY PIPES
CARBURETTOR HOUSINGS

Exhaust pipes:
The kit supplied resin exhaust pipes are of good quality, but I felt they were slightly undersize and therefore decide to create the exhaust pipes from brass tube.

To represent the exhaust pipes:

Chamfer the end of a 1.4 mm diameter tube (e.g. 'Albion Alloy's' MBT14 or similar).

Deburr the inside bore using a 1.2 mm diameter drill.

Deburr the outer edge of the chamfer end.

Roll cut the tube to a length of 5 mm.

Plug the non-chamfered end of each exhaust pipe with modelling putty.

Repeat to create a total of six exhaust pipes.

Dry fit for checking:
Now that all possible modifications have been made to the engine and its components, it's time to paint the various parts prior to assembly.

Airbrush prime the engine assembly and all of the components with a grey primer (e.g. 'AK Interactive' Grey AK-758 or similar).

Check the engine and components for any surface imperfections etc and re-work as required.

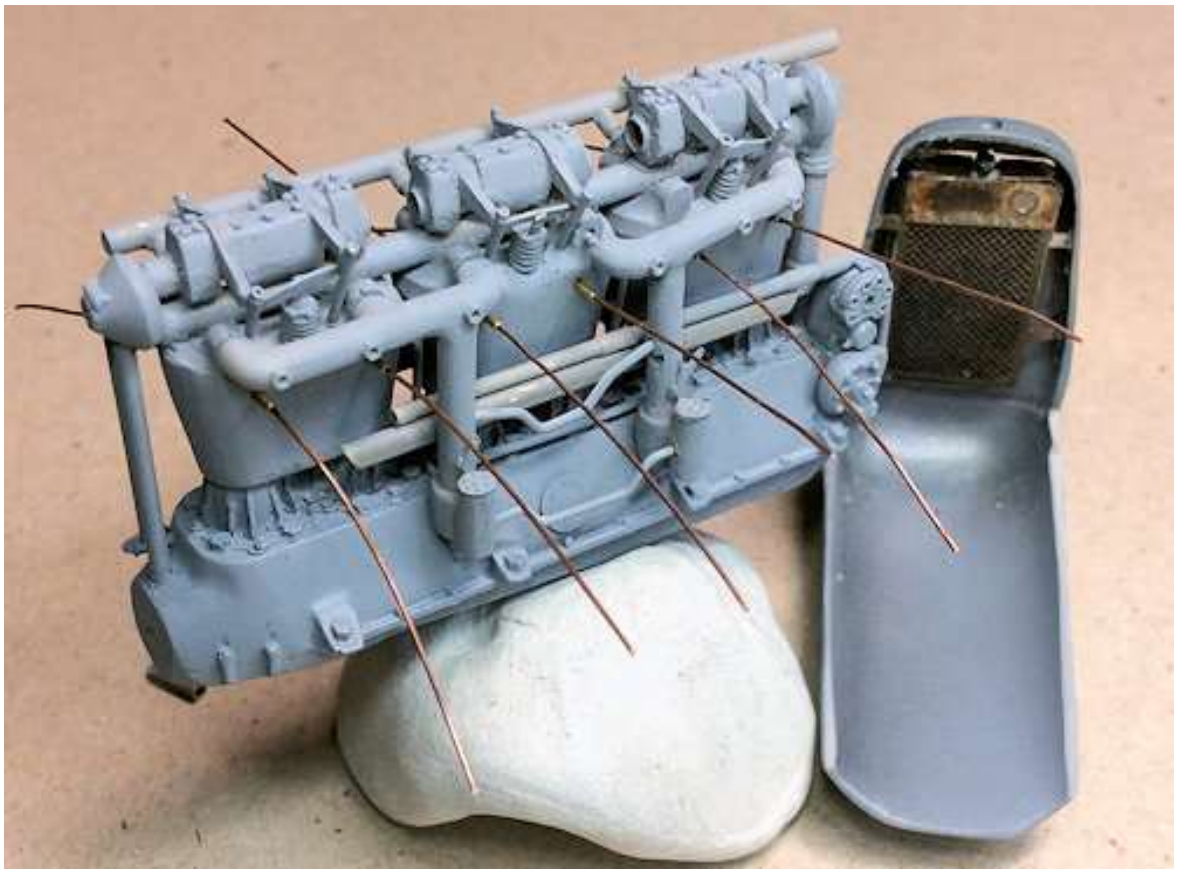
Re-prime any re-worked areas until the surface finish on the engine and its components is as defect free as possible.

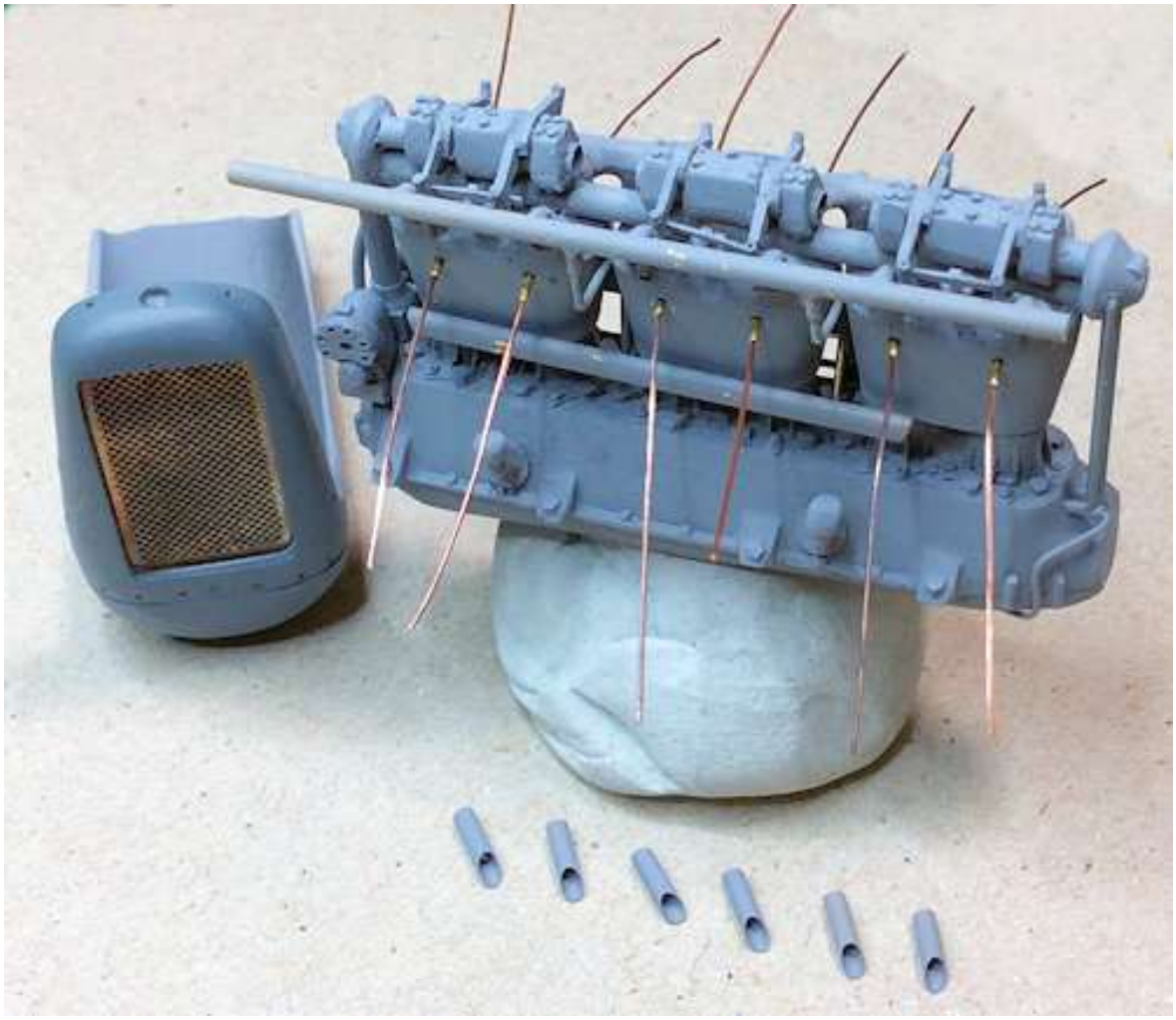
Dry fit all of the created parts onto the engine (apart from the exhaust pipes).

Make sure everything locates correctly.

Propeller shaft hole:
Drill a hole of 1.5 mm diameter and approximately 10 mm deep into the engine casing, centrally in the casing at the opposite end of the engine to the fitted magnetos.

NOTE: *The following photographs show 'test' spark plugs and leads, not the plugs and leads that will be fitted.*





Engine cowl:

The exposed engine, although located high above the water line, was still prone to water spray. The forward part of the engine was protected by a cowl, hinged at the centre top for access. Although there are many photographs of this aircraft with the engine cowl fitted, just as many show that the full cowl was not fitted at all, leaving the engine exposed. Some photographs show the cowl not fitted, but with triangular plates located to the rear of the engine radiator, covering the magnetos on each side. However these plates may have been fitted only to aircraft flown by American Naval units, operating from bases in Italy.

The subject aircraft for this model did not have the cowl fitted, which allows the entire engine to be visible. **Therefore kit part 8 is not required for this particular aircraft**.

Engine - painting:

NOTE 1: *Photographs of the 'Isotta Fraschini V4B' and V6 engines appear to show that for the most part, the V4 engines had a black finish to the cylinder jackets, whereas the V6 engines had a more bronzed finish. As the engine for this aircraft had the V4 engine, the cylinder jackets should be black in colour.*

NOTE 2: *When brush painting acrylics, add a few drops of 'Mr. Colour' Self Levelling Thinners, which helps with paint flow.*

Airbrush prime the engine assembly and component parts (except spark plugs) with a black primer (e.g. 'Alclad' Black Gloss Base ALC–305 or similar).

Airbrush prime the engine assembly and component parts (except spark plugs) with 'Alclad' Duraluminium ALC–102 or similar).

NOTE: *The following paint guide is based on existing photographs and a little 'poetic license.*

Brush paint the engine and components as follows:

Cylinder cooling jackets, induction manifold drop pipes, carburettor housings, coolant feed pipe hose - 'Tamiya' Rubber Black (XF85).

Magneto front housings - 'Tamiya' Hull Red (XF9).

Magneto switch faces, two carburettor tops and oil filler caps - 'Mr. Colour' Brass (219).

Induction manifold top pipes - 'Mr. Colour' Aluminium (218).

Overhead valve gear and housings, magnetos drive shaft, carburettor levers - 'Mr. Colour' Stainless Steel (213).

Cylinder 'finned' bases, crankcase access plate - 'Mr. Colour' Iron (212).

Both lubrication pipes (crankcase to valve gear - 'Mr. Colour' Dark Iron (214).

Exhaust pipes:

Airbrush a light misting coat of 'Tamiya' Hull Red Deck Tan (XF9).

Dry brush 'Tamiya' Flat Brown (XF10) sporadically along each pipe.

Lightly dry brush the pipe open ends with 'Tamiya' Weathering Master Set B (Soot).

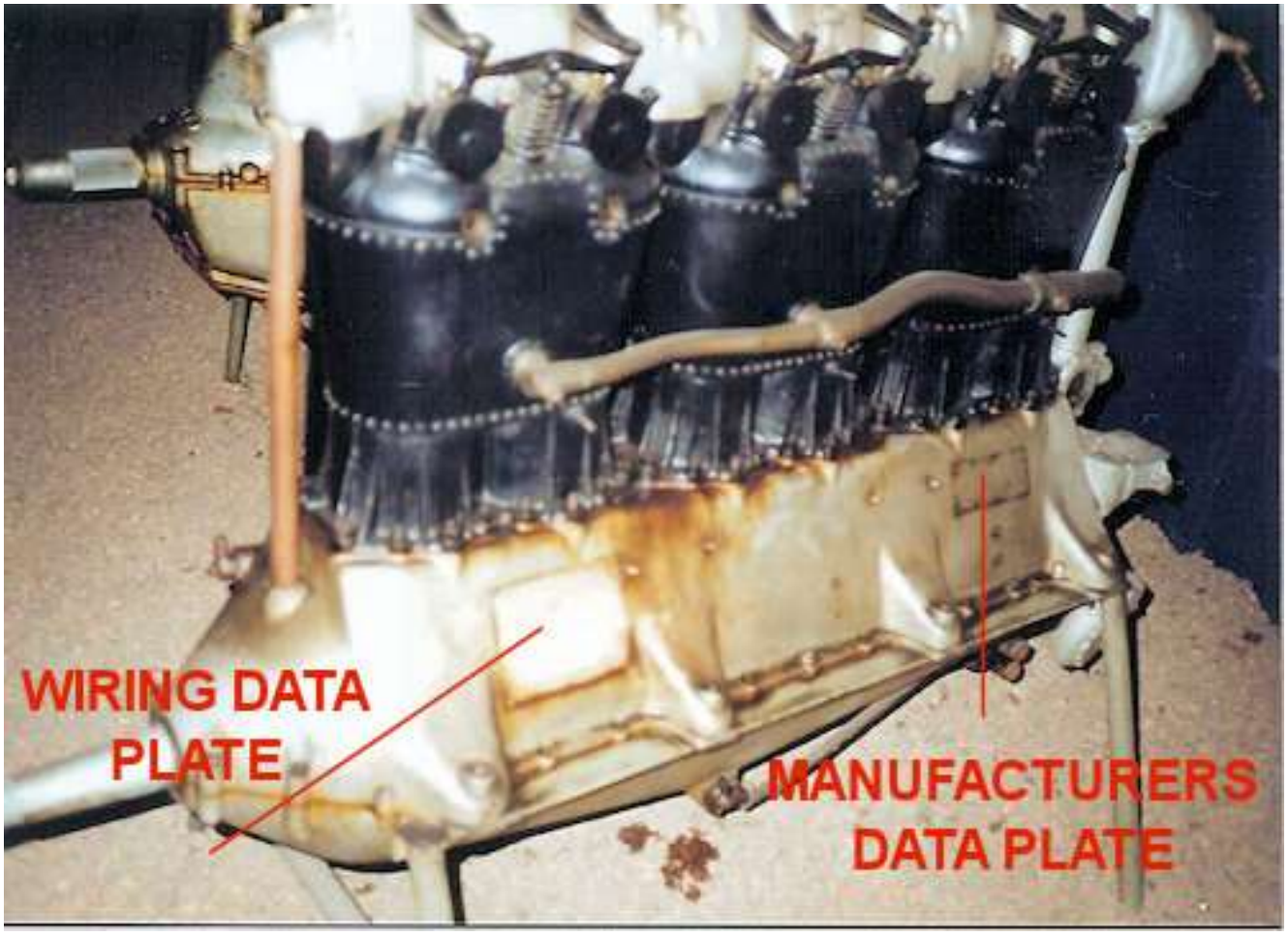
If desired you can lightly sponge along the centre areas of each pipe with 'Tamiya' Weathering Master Set B (Rust).

Engine data plates:

Two data plates were attached to the engine crank case. One was the manufacturers plate and the second the magneto and ignition leads data plate.

Manufacturers date plate

Magneto and ignition leads data plate.



Neither of the data plates are provided in the kit as decals. To print decals this small would be difficult to achieve clarity of print. **Therefore I used similar decals from my 'spares' to represent these data plates.**

Engine - build:

NOTE: *Refer to the photographs on page 123 for component locations. Use CA adhesive to secure components in position.*

Secure the two ignition lead support rails into the pre-drilled holes in the engines two rear cylinder jackets.

Secure the coolant feed pipe onto the top of the ignition support rail and the flexible ’hose’ to the rear of the water pump.

Secure the twin induction pipe assembly into the pre-drilled holes in the induction lugs on the top of the engine.

Secure the two interconnecting pipes into the pre-drilled holes in the induction pipes.

Secure the coolant return pipe onto the tube connectors at the top of the engine. Make sure the two pipes attached are routed through the gaps between the cylinders.

Brush ‘AK Interactive’ Kerosene (AK2039), thinned with White Spirit, over the engine (except the overhead valve gear) and brush to create oil and grime stains.

Brush ‘AK Interactive’ Aircraft Oil (AK2019), thinned with White Spirit, over the overhead valve gear and brush to create an ‘oiled’ weathering.

Secure the twelve spark plugs into the pre-drilled holes in the cylinder jackets.

NOTE: *In the following step the front ignition lead only is routed to its spark plug from the open, forward end of the support rail.*

Cut each of the spark plug leads and route them down and behind the ignition support rails.

Cut twelve lengths of 0.3 mm diameter ‘PlusModel’ lead wire.

Secure a wire into each of the pre-drilled holes in the front face of each magneto.

Route two of the wires from each magneto into the rear of the support rails and secure in position.

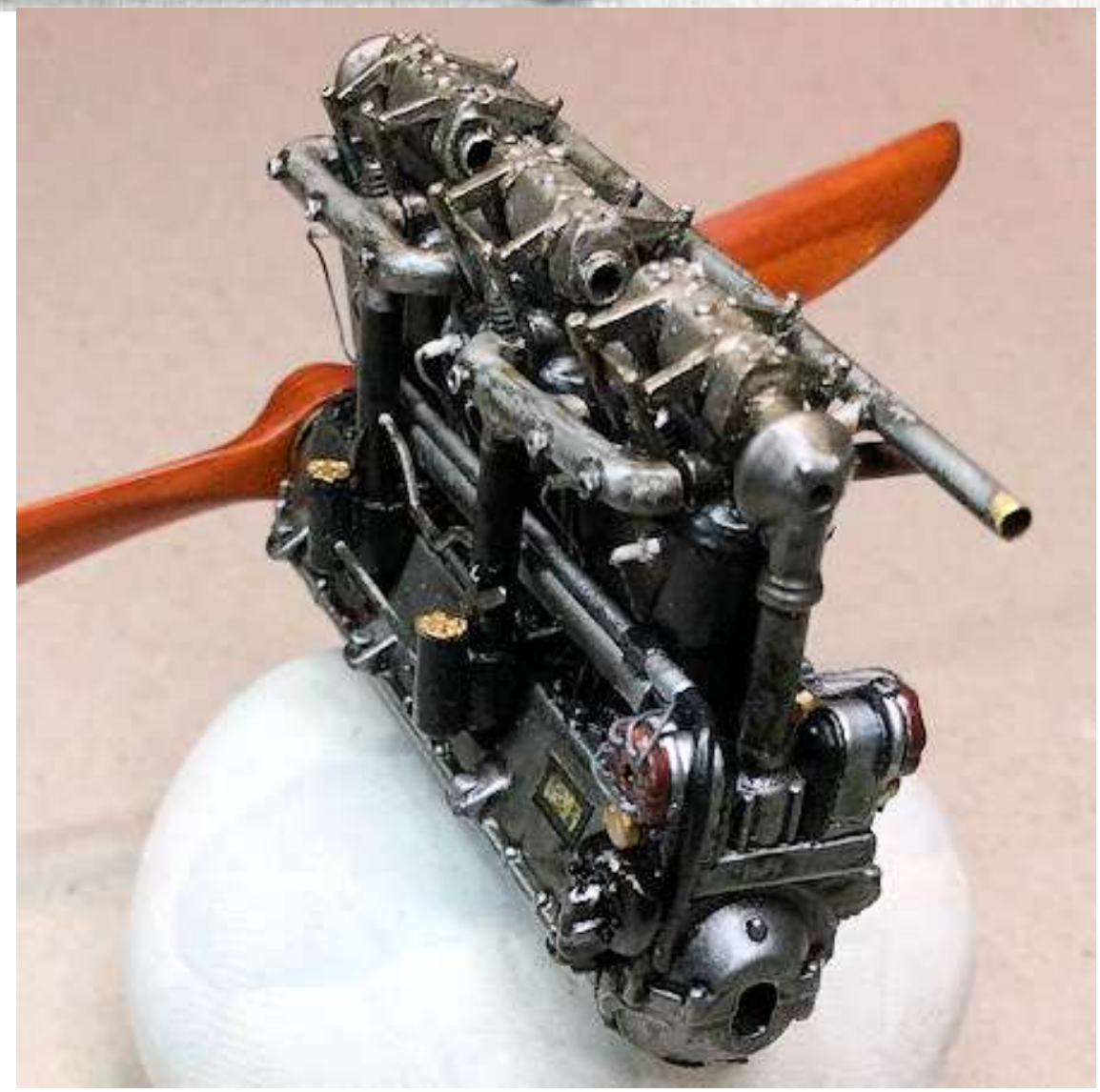
Route the remaining wires to the rear of the support rail and secure in position onto the two wires already installed.

Exhaust pipes:

NOTE 1: *The kit supplied exhaust pipes were intended to locate into depressions in the engine mountings. However as these kit parts are not being used, the parts created earlier will need to be 'butt' glued to the engine.*

NOTE 2: *During the next step, make sure the chamfered on the exhaust pipes is facing rear-wards (towards the propeller end of the engine).*

Secure each exhaust pipe onto the location lugs on the top, side of the cylinder jackets (opposite side to the side of the engine with the induction manifolds).



PART 9

COCKPIT WITH MODIFICATIONS

PART 9 - COCKPIT WITH MODIFICATIONS

NOTE 1: *All assembly of all parts is carried out **using CA adhesive**.*

NOTE 2: *The following assembly of the cockpit detail does not follow the instruction manual, but is the order that I found the easiest.*

Cockpit area:

The next step is to construct the cockpit area as the kit parts need to be modified and additional details added.

NOTE: *During the following step, take care when handling and working on the various cockpit parts. They are both small and fragile.*

Refer to the first four pages of the kit instructions:

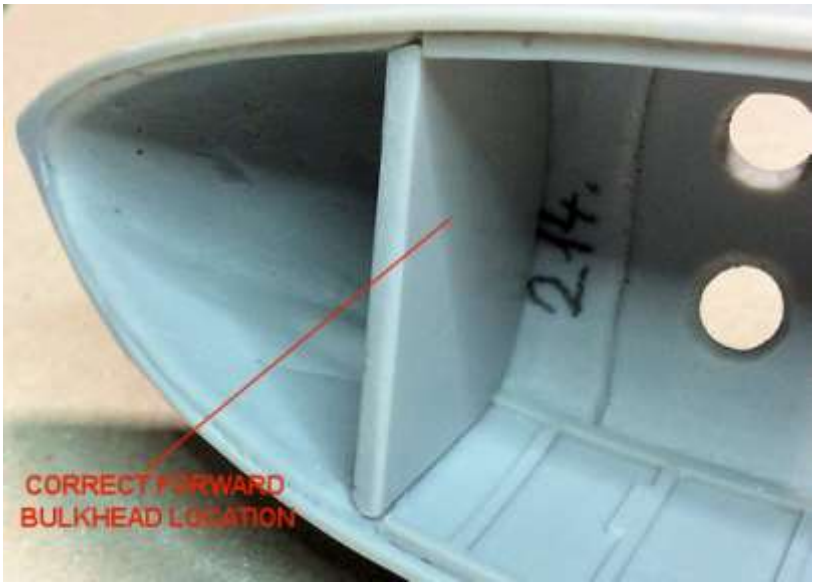
Remove the required resin parts from their backing sheet. Carefully scrape or sand away residual sheet resin.

Remove the required photo-etch parts from the sheet. Carefully cut or file off any sheet 'tags' from the edges of the parts.

If available, use a photo-etch bending tool or similar and form the photo-etch bulkhead part 6.

NOTE: *The instructions for locating the forward bulkhead (part 16) are incorrect and if followed, will result in the hull bottom (part 56) not fitting into the fuselage.*

Secure the forward bulkhead into the fuselage as shown in the following photograph. Make sure the tapered edge of the bulkhead angles down towards the fuselage nose. If fitted the wrong war around it will protrude from the bottom of the fuselage.



NOTE: *The rudder bar (part 41) is intended to fit into a small location on the rudder bar support on part 30. However this is probably too weak.*

Drill a hole of 0.4 mm diameter through the centre of the rudder bar and its floor support.

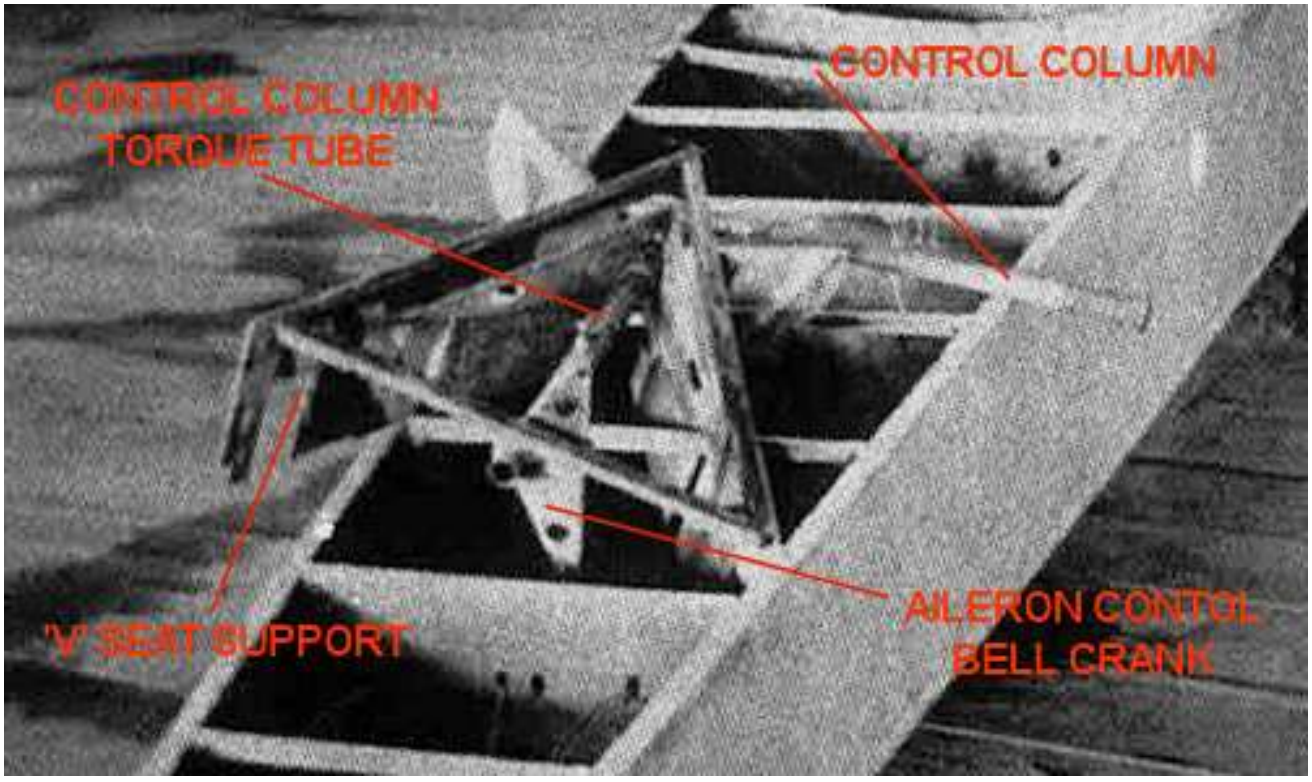
Cut a short length of 0.3 mm diameter tube (e.g. 'Albion Alloys' MBT03).

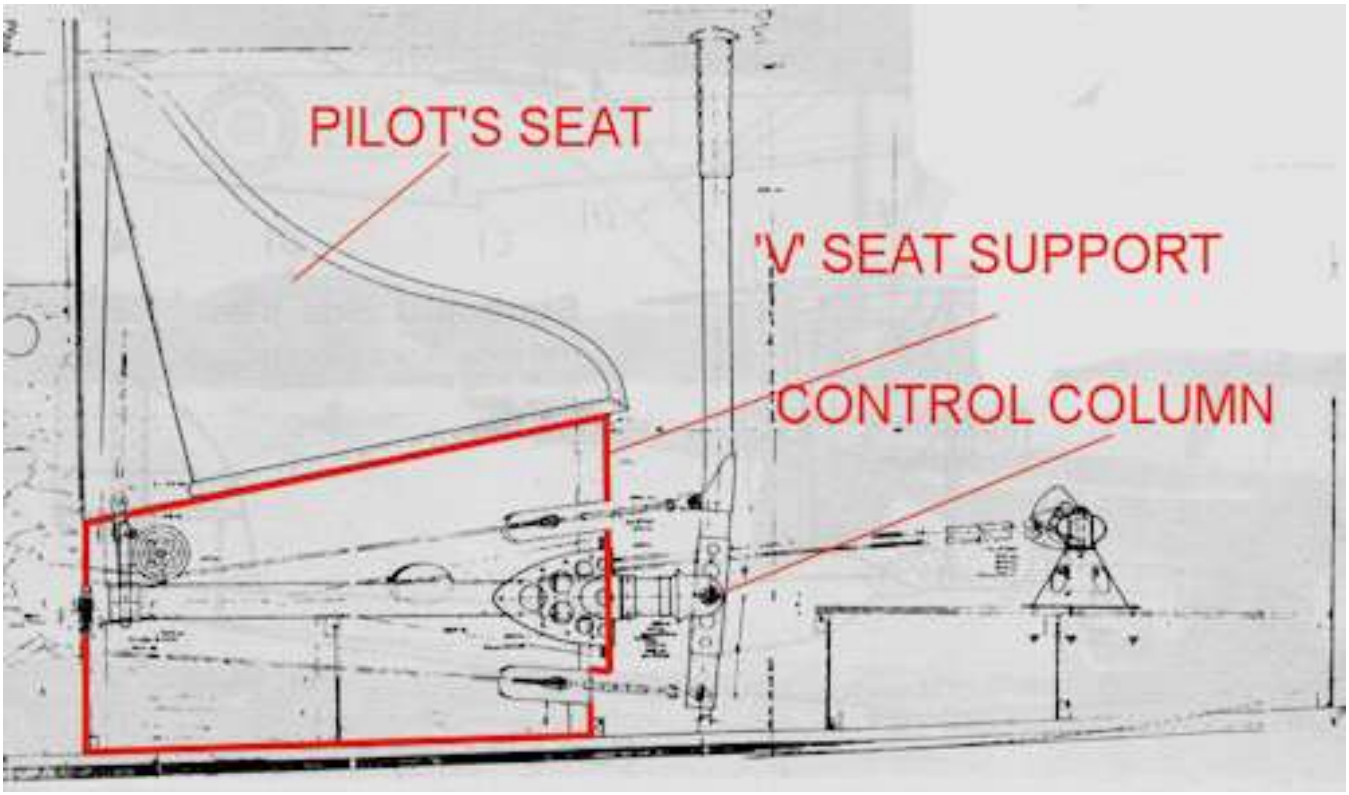
Insert the tube into the pre-drilled hole in the rudder bar and secure in position.

Insert the tube into the pre-drilled hole in the floor support and secure in position.

Pilot's seat support:

The pilot's seat was supported, from underneath, by a 'V' shaped support, which also acted as support for the control column assembly. This support is not supplied in the kit.





To represent this 'V' support for the pilot's seat:

Cut from thick paper or 0.5 mm plasticard two 'plates' that can be fitted under the pilot's seat and support frame. These 'plates' should contact the rear inside edge of the seat support frame then angle inwards each other centrally under the front of the seat, leaving a gap between the two of 2.0 mm.

File a small notch into the underside of the rearmost cross member on part 30 (to give the control column torque tube better adhesion).

Location the control column (part 37) as shown in the instructions, securing the torque tube in position in the created notch.

Secure the pilot's seat support onto the hull floor (part 56) as shown in the instructions. Make sure the seat support is positioned centrally on the hull floor.

NOTE: *The pilot's seat when fitted needs to be further forward on the support frame than shown in the instructions. This is to avoid the rear of the seat fouling the rear bulkhead in the fuselage when inserting the cockpit assembly.*

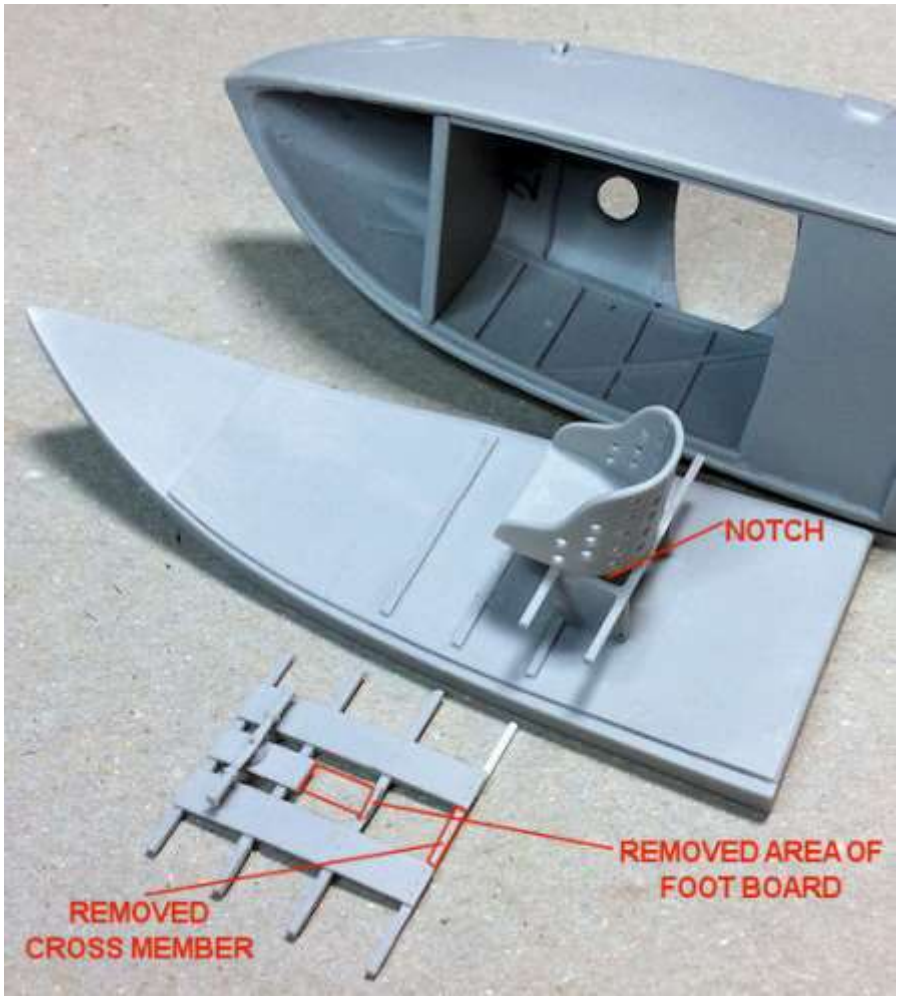
Secure the pilot's seat onto the seat support with the bottom, rear edge inline with the rear edge of the rear cross member on the seat support frame. Make sure the seat is positioned centrally on the seat support frame.

NOTE: *Modification of the foot boards is required to allow fitting of the control column, keeping it reasonably clear of the front of the pilot's seat.*

As shown on the following photo-graph, carefully cut away the rear section of the centre foot board and the rear cross member, which allows the control column to be fitted further forward.

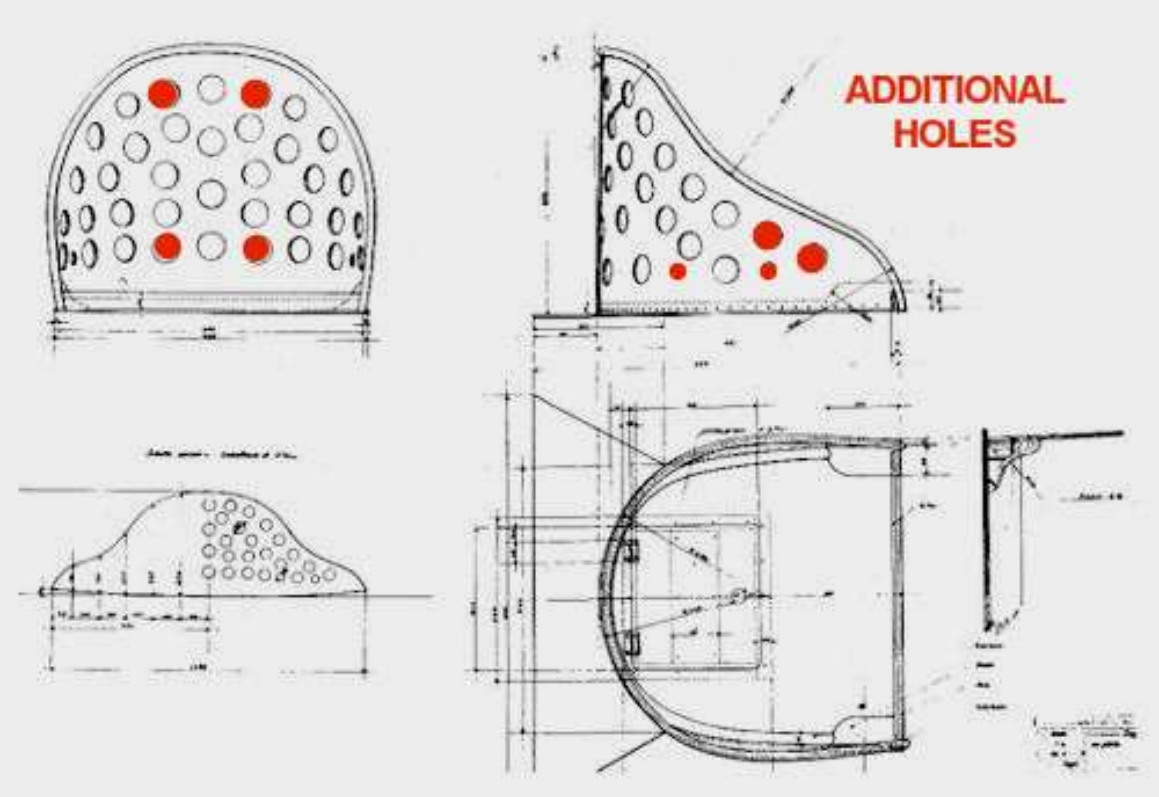
On the rear cross member pre-moulded onto the hull floor, cut away the central portion of the member to the inside edge of the seat support frame. Mark the centre of the central cross member and cut a notch to allow the torque bar of the control column (when fitted) to be in contact with the hull floor.

Press a point into the floor boards (3 across each joint to the cross members, to represent the nail heads.



Pilot's seat:

The pilot's seat supplied in the kit is of good quality. However the pre-moulded lightening holes in the seat back differ slightly from official drawings. For authenticity some additional holes can be drilled in the seat back.



Using a drill of 1.0 mm diameter, mark and carefully drill holes through the seat back (8 larger holes indicated in red on the drawing).

Using a drill of 0.8 mm diameter, mark and carefully drill holes through the seat back (4 smaller holes indicated in red on the drawing).

Seat belt slots:

The seat belts passed through slots in the seat back, rather than over the sides of the seat, as shown in the instructions.

Carefully drill 0.8 mm diameter holes on both sides of the pilot's sat, between the holes as shown on the following photograph.

Carefully cut out the slots with a straight edged blade to create the slots.

Seat thickness:

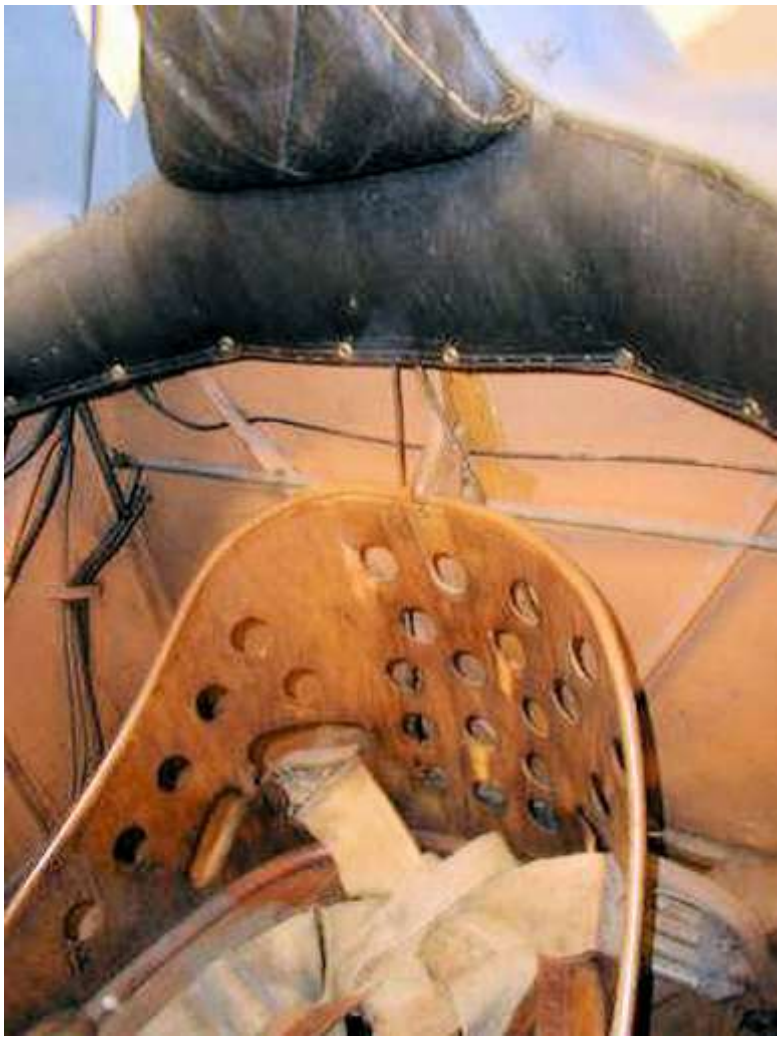
The seat, as supplied in the kit, has a too thick seat back. The actual seat back was made with thinner plywood than represented on the kit supplied seat.

Using a flat sanding stick or similar, carefully sand away the rear surface of the seat to reduce it to a more representative thickness.

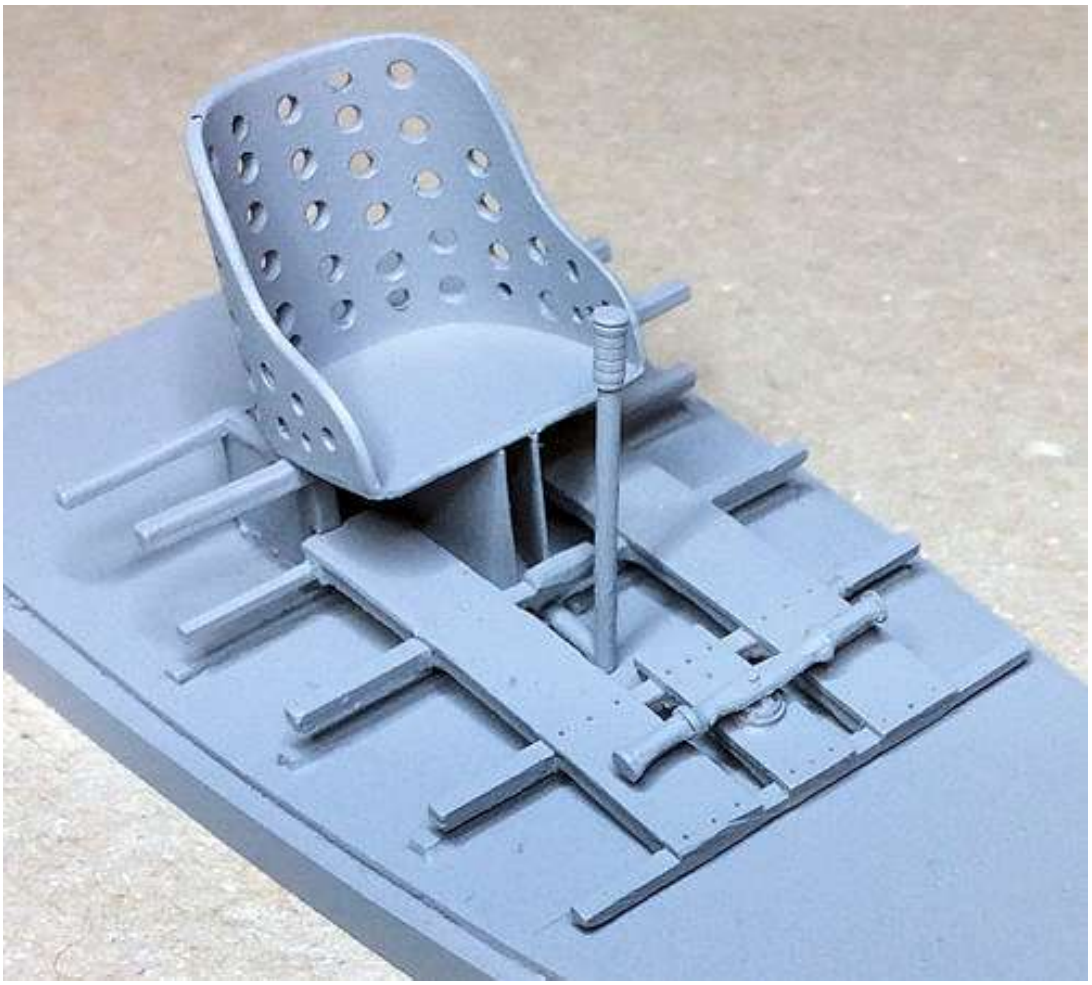
Seat rolled edge:

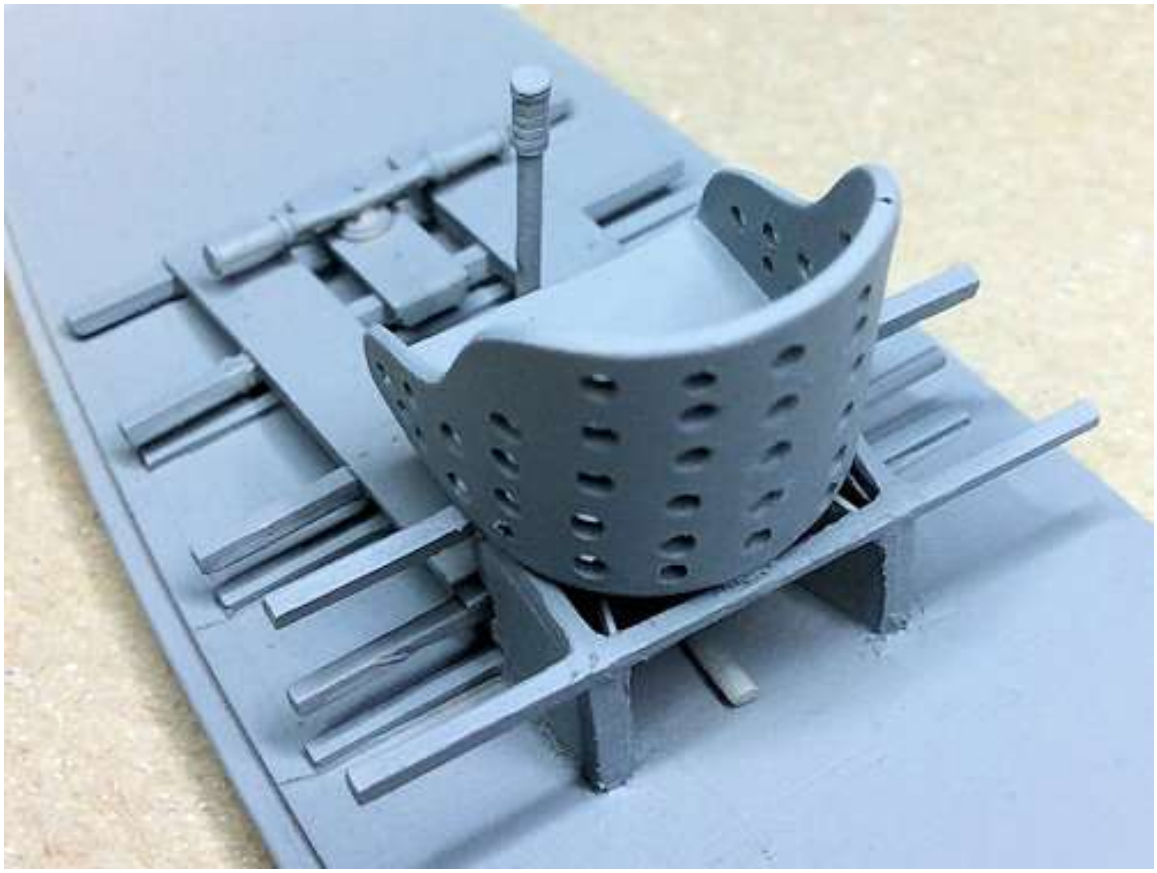
The seat had a rolled edge around the seat back, to cover the flat edge of the seat back. This rolled edge is not represented on the kit supplied seat.

Using 'PlusModel' 0.4 mm diameter lead wire (or similar), carefully secure a length around the seat back with thin CA adhesive.



NOTE: *The following photographs show the original, unmodified pilot's seat (refer to pages 132 and 133 of this build log).*





Shoulder padding:
Photographs of the aircraft cockpit show shoulder padding attached to the rear cockpit edge, which with the padded head rest gave the pilot some protection. This shoulder padding is not supplied with the kit.

To represent the shoulder padding:

NOTE: *The surface of the shoulder padding does not have to be smooth, as it was padded leather and subject to wear and deformation.*

Using CA adhesive, secure the head rest (part 20) onto the fairing of the fuselage.

Using modelling putty (e.g. 'Milliput' two part putty or similar), roll out a length of the putty and position it onto the cockpit rear bulkhead, under the fitted head rest.

Form the putty around the cockpit rear edge and against the rear bulkhead and cockpit sides.

Using a point (e.g. tooth pick) lightly impress 'stud' fasteners around the bottom of the padding.

Carefully remove any excess putty then leave the added shoulder padding to fully cure.

Once fully cured, carefully scrape or sand the 'Milliput' to shape it and better replicate leather padding.

Seat fixture:
The photo-etch supplied with the kit has part 19, which is intended to represent a curved support for the top of the pilot's seat, although I could not find any references to this type of seat support. However photographs do show a fixture connecting the top, rear edge of the seat to the rear bulkhead of the cockpit.

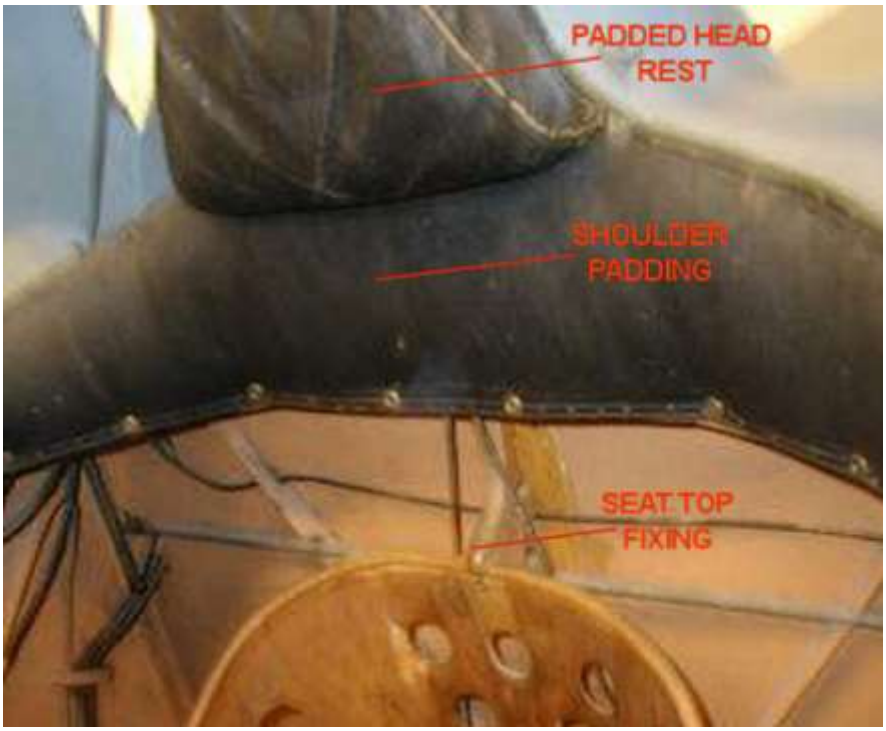
To represent the seat fixture:

Locate the hull floor and seat assembly into the fuselage.

Lightly mark the top centre of the pilot's seat onto the cockpit rear bulkhead.

Cut two short lengths of 'PlusModel' 0.5 mm plastic rod.

Using CA adhesive, secure the two rods together on the rear bulkhead, centrally over the pilot's seat.



Seat belts:

NOTE 1: *The supplied 'HGW Models' seat belts are assembled using photo-etch parts 28 and 29 from the kit supplied photo-etch sheet.*

NOTE 2: *When assembling the seat straps, use CA adhesive. To avoid the adhesive soaking through the seat belts and sticking to the working surface, assemble the belts on a shiny surface, such as tile. When holding down the belt joints to allow the adhesive to set, keep the belt moving over the shiny surface, which should stop the adhesive sticking the belt to the working surface.*

NOTE: *The pilots seat has had to be positioned further forward on its support frame. The seat belts anchors should be located on rear cross members of the seat support frame. The anchor straps should be used rather than the photo-etch anchors (28), otherwise the straps won't reach over the seat.*

Following the instructions, assemble the seat belts ('HGW Models' Macchi M.5 belt set - HPH 32035R), but use the anchor straps, not the photo-etch anchors 28..

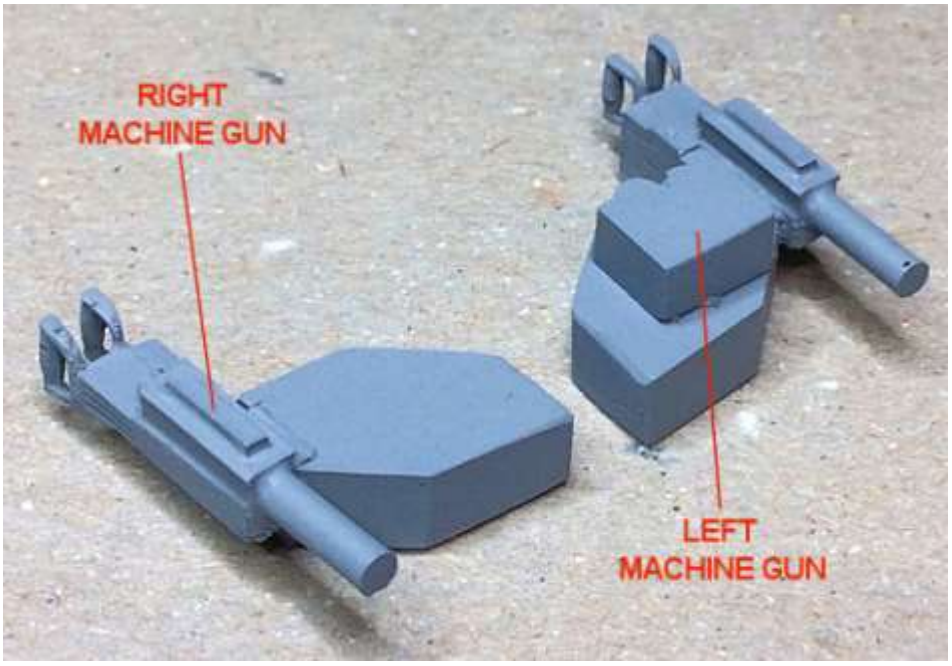
Brush over the assembled seat belts with 'AK Interactive' Filters (Wood AK-261) thinned with White Spirits.

Weapons:

NOTE: *Take care when handling the two machine gun bodies (parts 44) as the handles are very fragile and easily broken.*

Refer to the instructions and assemble the right mounted machine gun (parts 44, 22 and 25). Make sure the parts are correctly orientated.

Refer to the instructions and assemble the left mounted machine gun (parts 44, 22, 23 and 25). Make sure the parts are correctly orientated.



Cockpit modifications required:

The supplied kit parts for the cockpit appear to have been partly based on a Swedish M.5, which differed in some respects to the Italian M.5. The cockpit components supplied in the kit will need to modified or repositioned to better represent the actual Italian M.5 aircraft cockpit.

The two machine guns need to be positioned farther rearwards in the cockpit and closer to the cockpit sides.

Kit photo-etch part 15 is a ratcheted lever which is connected to a control leading from the left side of the cockpit coaming and up to the engine. This is possibly a shutter control for the front of the engine, which does not seem to have been fitted to Italian M.5 aircraft. Therefore is has will not be used for this build.

In addition to the kit supplied parts, the following modifications will be required:

I found that the instrument panel support bar (kit part 39) is not long enough to span the cockpit as shown in the instructions, its position is too close to the pilot and also the outer ends stop the two machine guns from being positioned correctly in the cockpit.

Two pipes from the fuel contents gauge and oil pressure gauge along the top, right side of the cockpit (out and up the right support strut to the engine).

Two gun trigger cables.

Half compression lever and control (right side fuselage).

The resin control rod on kit part 33 is far to frail and easily broken. Therefore this was cut away to be replaced during the build.

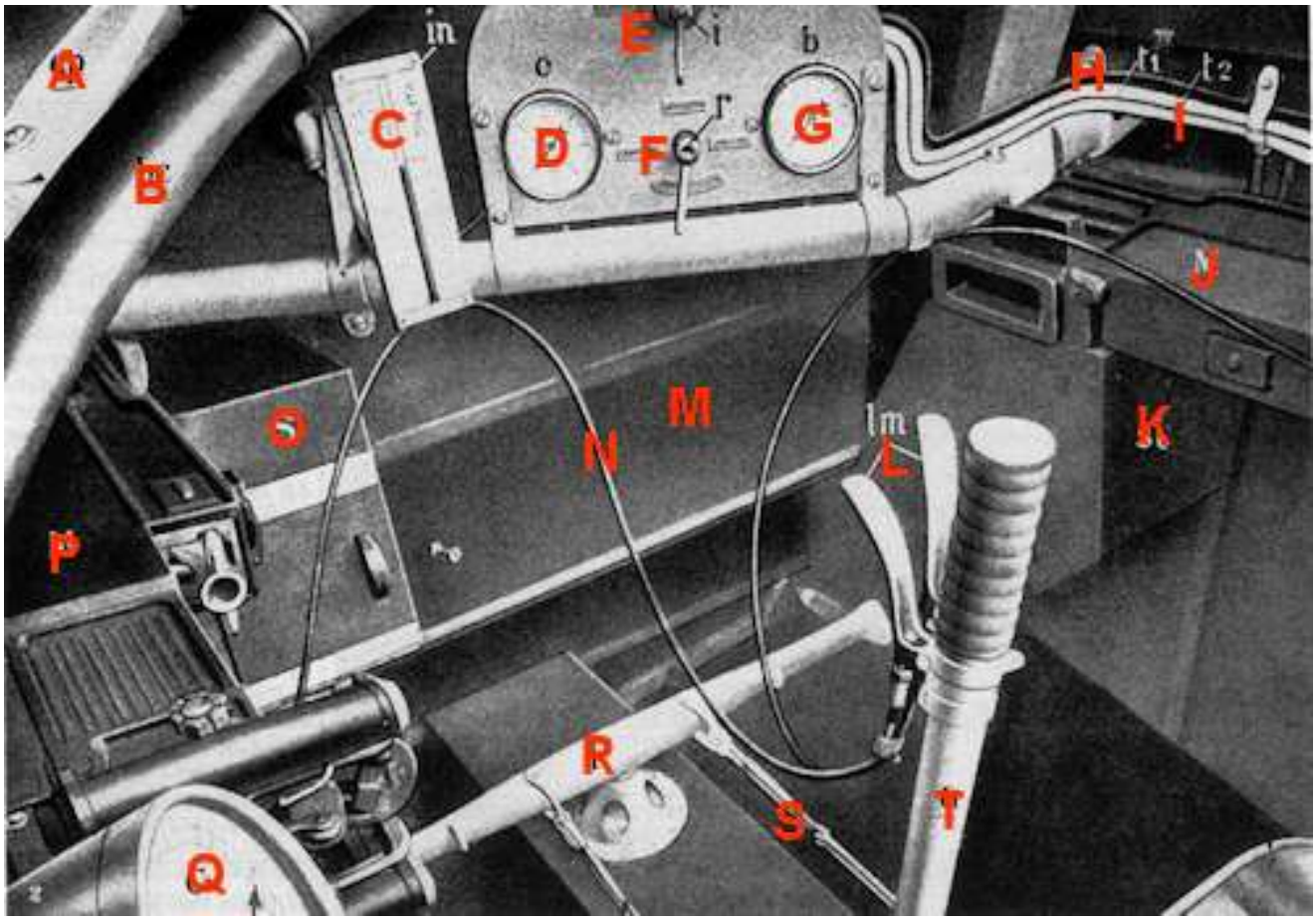
Magneto switch and wiring (left side fuselage).

Fuel mixture/spark advance levers and controls (left side fuselage).

Starter magneto and wiring (left side fuselage).

Glazed covers for the two fuselage ports.

Details from the aircraft manual



A = Windscreen

B = Cockpit padding

C = Climb indicator

D = Oil pressure gauge

E = Pressure control/release valve

F = Air pump selector

G = Fuel contents gauge

H & I = Fuel/oil pipes

J = Right machine gun

K = Spent cartridge container (right)

L = Gun triggers

M = Storage container

N = Gun trigger cables

O = Spent cartridge container (left)

P = Left machine gun

Q = Tachometer

R = Rudder bar

S = Rudder control cables

T = Control column

NOT SHOWN:

Aileron control cables.

Half compression lever (right side fuselage)

Magneto switch (left side fuselage)

Mixture/spark advance levers (left side fuselage)

Starter magneto (left side fuselage)

NOT REQUIRED:

Camera shutter/camera hatch operating levers

Instrument panel, indicator and support bar: *(Refer to the previous photograph)*

To replace the kit part 39, cut a length of 1.0 mm diameter rod (e.g. ‘Albion Alloy’s or similar).

Using kit part 39 as a guide, bend the ends to shape, leaving more length than required to span the cockpit.:

One bent end should be longer than the other.

The shorter bent end should be to the right side of the fuselage.

The central section of the bar, when installed, should face to the left of the pilot’s seat.

Assemble the photo-etch climb indicator (PE14 and 18) using thin CA adhesive. This requires bending of the two ‘legs’ around the instrument panel support bar.

NOTE 1: *If decals are to be used on PE 17 (fuel and oil gauges), do not paint either instrument face as shown in the kit instructions. Reverse the PE17 panel when fitting to PE22, as both of the instrument impressions will not be required.*

NOTE 2*: The two photo-etch switches (PE30 and 31) were not used.*

Assemble the photo-etch instrument panel (PE17, 23 x 2 and 22) using thin CA adhesive. This requires bending of the ‘leg’ around the instrument panel support bar.

NOTE: *In the following step, make sure the panel and indicator are correctly position on the rod. The instrument panel support bar is fitted into the cockpit such that when both the climb indicator and instrument panel are installed, they are angled towards the pilot’s left.*

Position both the panel and indicator on the central section of the support bar and secure with CA adhesive.

Drill a hole of 0.4 mm diameter through the assembled panel, into the centre of the two switch locations.

Bend two short lengths of 0.3 mm diameter tube (e.g. ’Albion Alloy’s MBT.3 or similar) to 90 degrees and insert them into the drilled holes. Secure in position using thin CA adhesive.

Scrape or sand away the underside of the cockpit forward decking, to prevent contact with the tops of the installed instrument panel and climb indicator.

Trim both ends equally until the support bar can be inserted between the sides of the cockpit forward decking and above the pre-moulded cockpit side frames.

Machine guns - mounting:

When test fitting the two machine gun assemblies, I found that they were both angled inwards and not close enough to the fuselage sides. Therefore modification to the guns and inside of the fuselage was required.

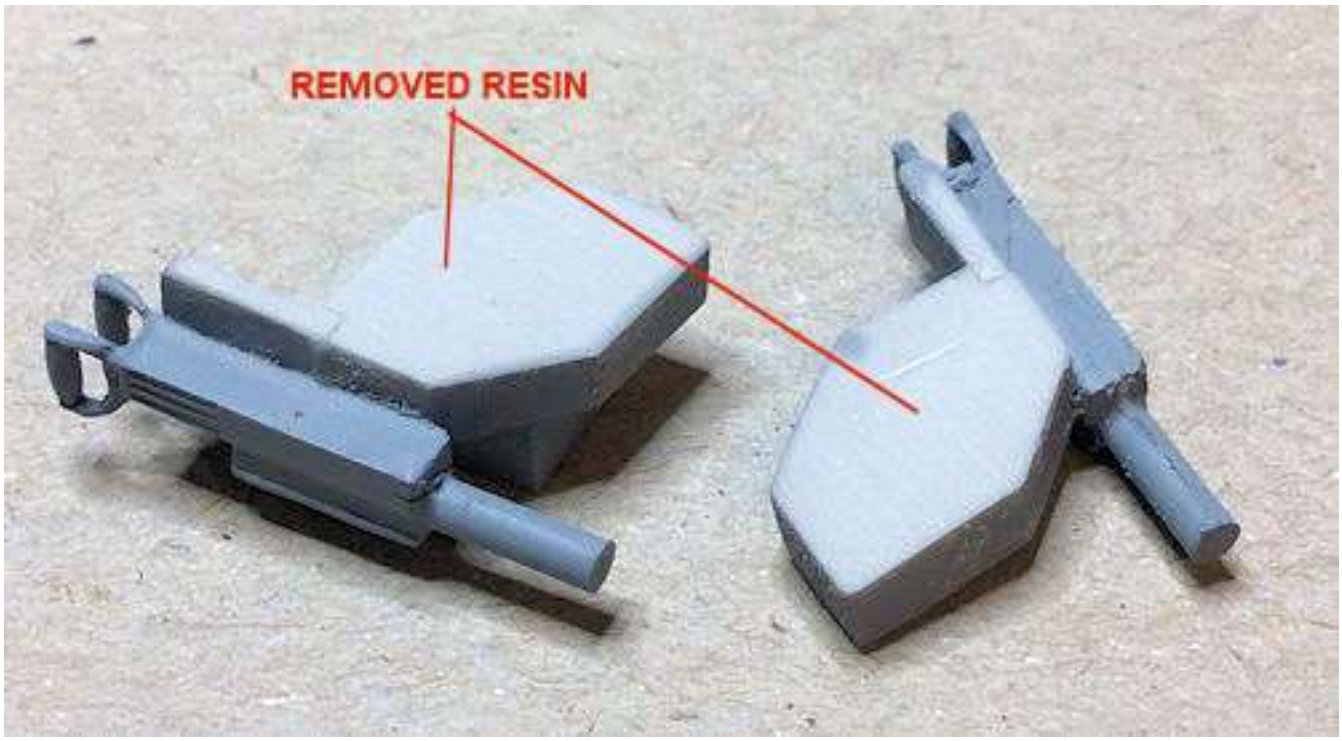
Scape or chisel out the cockpit side frames inside the fuselage, as shown on the following photographs. This allows the two machine guns to sit closer to the fuselage.

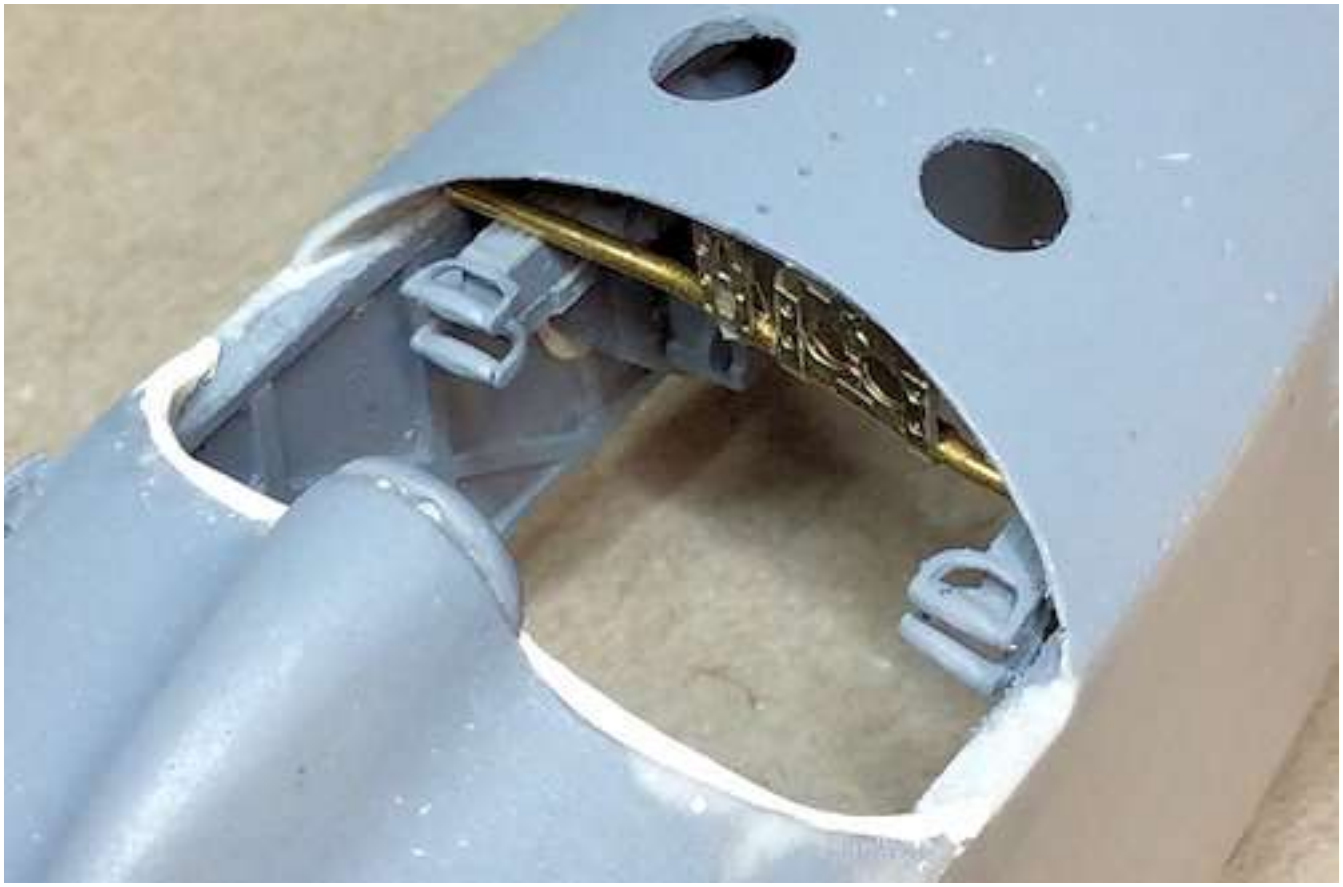
Scape or sand the outboard faces of the machine gun ammunition containers, as shown on the following photographs. The surfaces should be slightly angled with more resin removed from the forward ends of the containers. This allows the two machine guns to sit closer to the fuselage.

Test fit the instrument panel assembly into the fuselage and check that when positioned, the two machine guns sit close to the fuselage sides with the gun handles


REMOVED RESIN


REMOVED RESIN


REMOVED RESIN



Cockpit - forward padding:

The forward edge of the cockpit had padding fitted, which is not represented on the kit fuselage.

To represent the forward cockpit padding:

Cut a length of 'ANYZ' Black or Silver braided line 0.5 mm diameter (AN011).

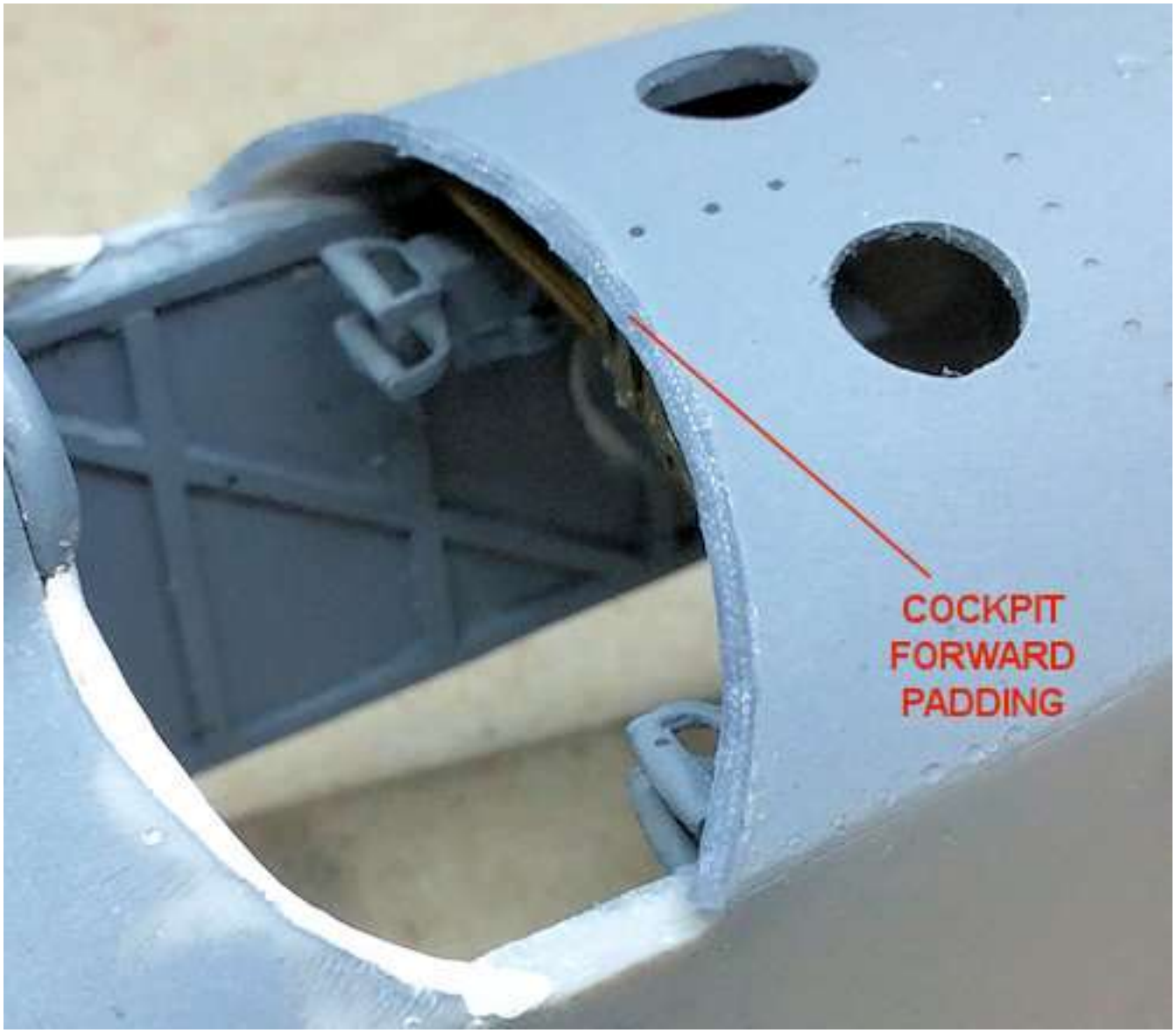
Apply thin CA adhesive to one end of the cockpit forwards edge.

Locate one end of the braided line onto the adhesive on the cockpit edge.

Working in steps, apply thin CA adhesive along the cockpit edge, positioning the braided line as you go.

Carry on until the braided line reaches the opposite end of the cockpit edge and trim to length.

Apply thin CA adhesive along the entire length of the braided line to reinforce the bond.



Cockpit side - step plates:

Bend the two step plates (PE8) at 90 degrees.

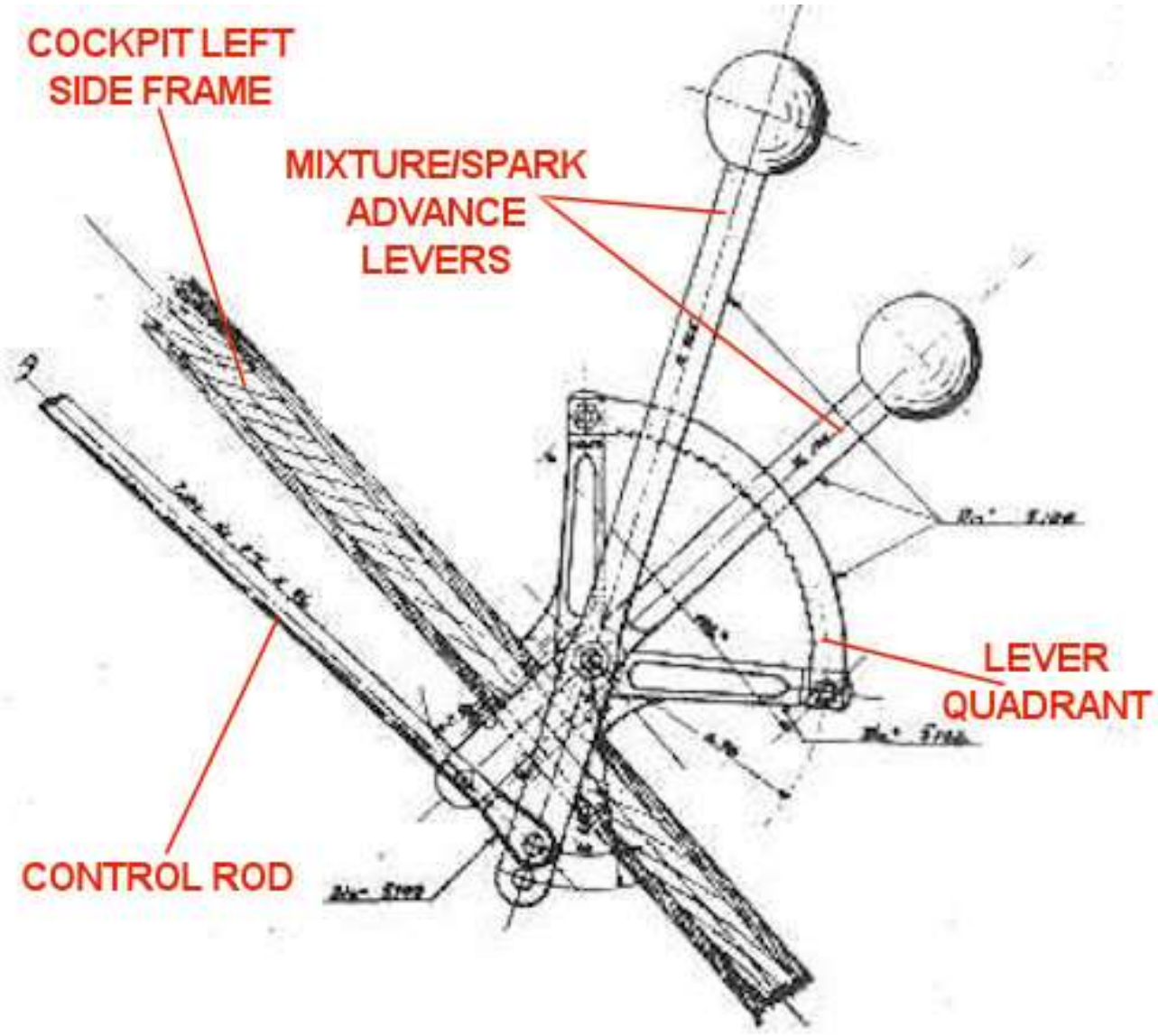
Position the step plates onto the top of the fuselage sides, between the applied Milliput cockpit rear padding and the cockpit forward braided line padding. Make sure the plates do not foul the padding.

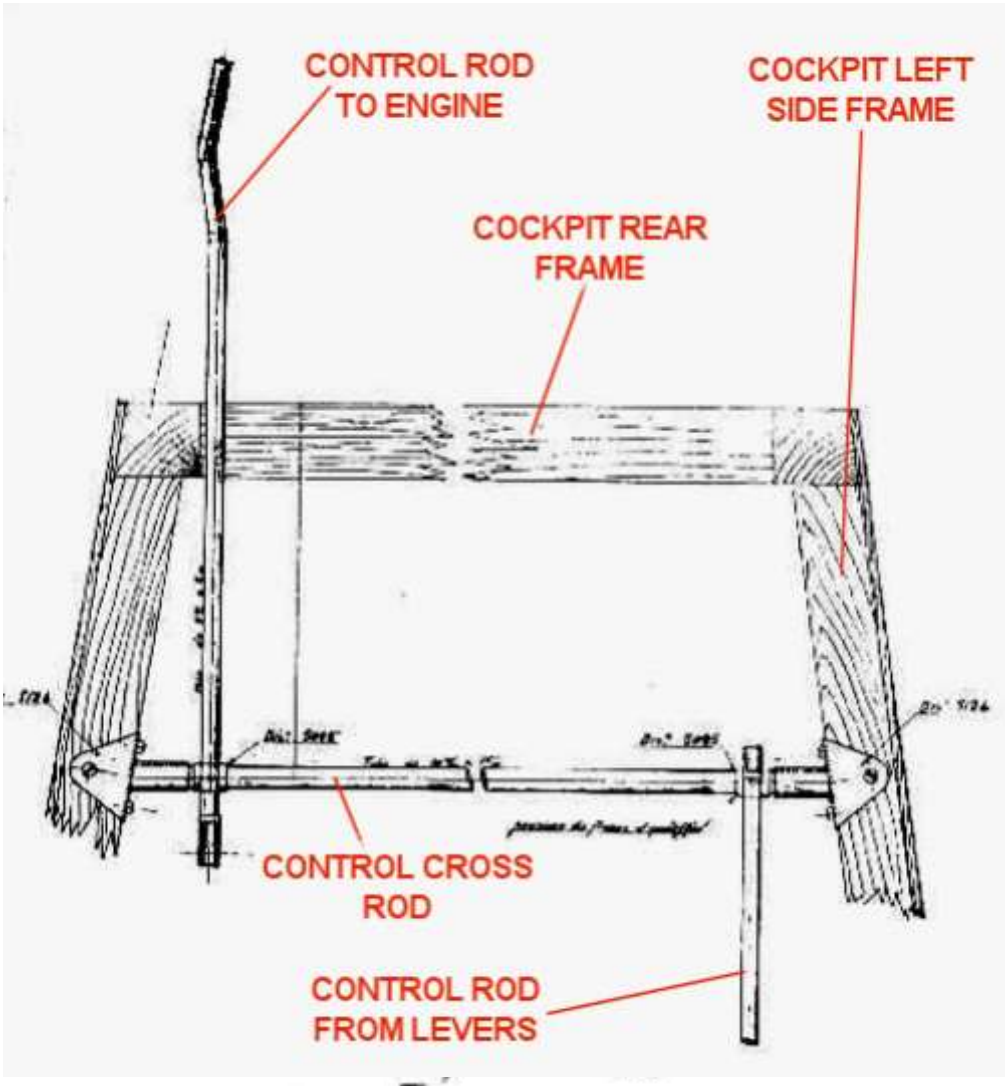
Secure the plates in position using CA adhesive.

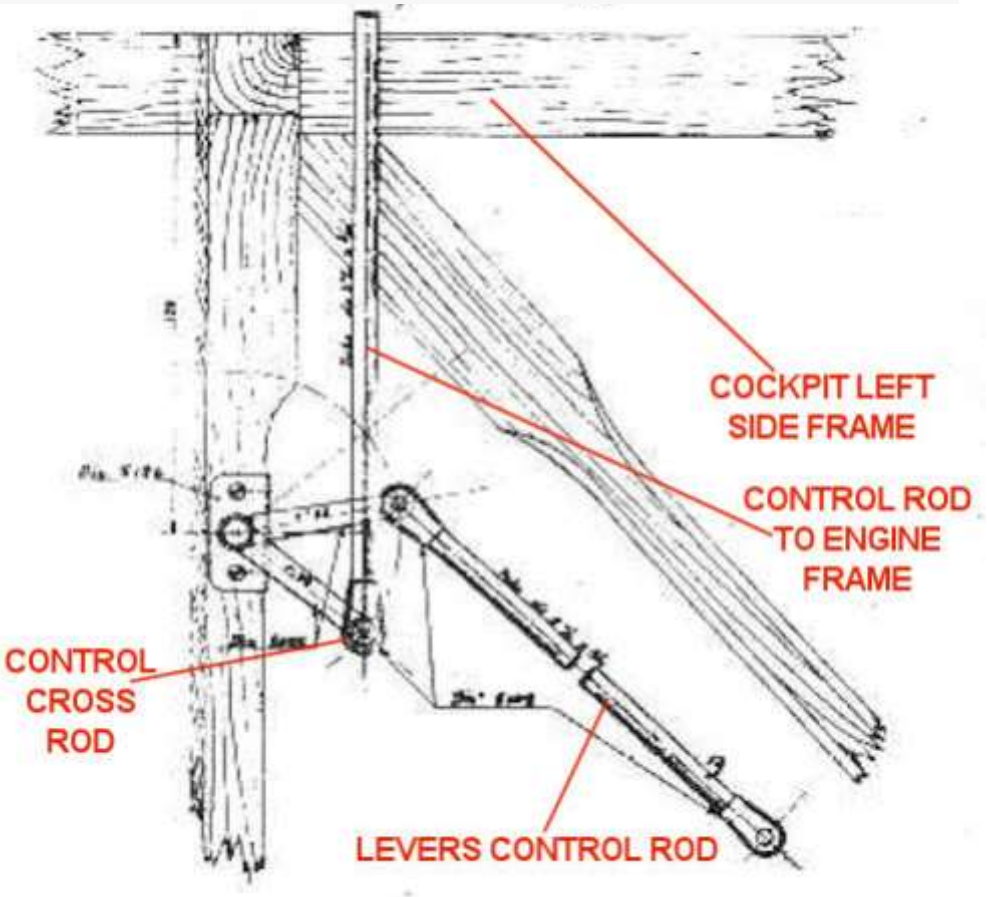
Fuel mixture/spark advance controls:

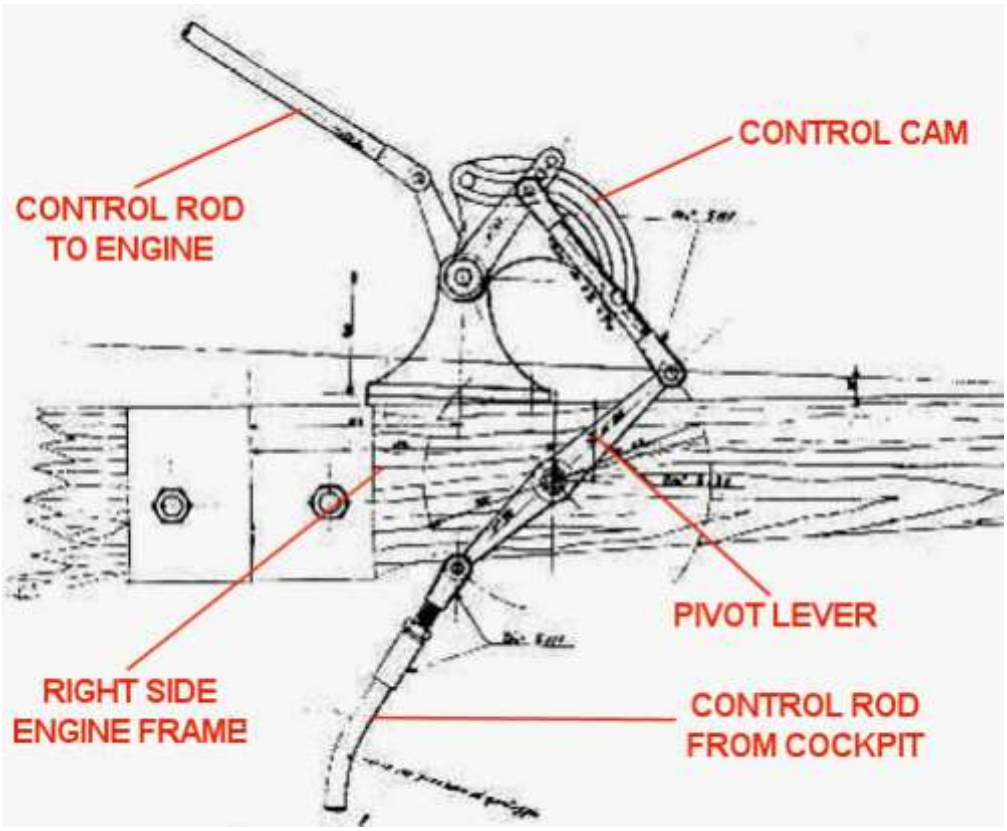
NOTE: *The following explanation of the engine fuel mixture and spark advance controls is based only on my interpretation of the Macchi drawings. Some of the inter-reactions between the control levers and control cams is not fully understood.*

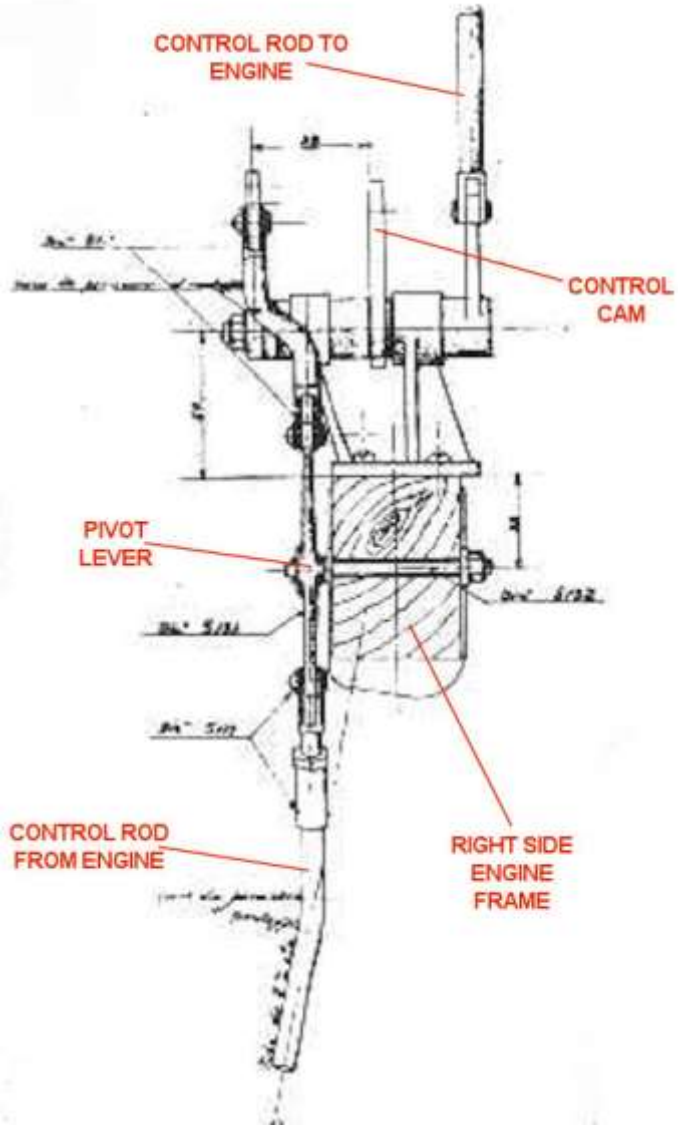
The fuel mixture and spark advance levers were located on the cockpit left side frame. The levers were interconnected on the control quadrant and to a single control rod, which was routed to the left rear of the cockpit. The rod connected to a control rod which was routed across the rear of the cockpit and there connected to control rod, which was routed up to the right side of the engine support frame. Here the rod was connected to a pivot lever, the other end of which connected to a short control rod, connected to cam lever. On the opposite side of the control cam shaft was a control rod, which was routed to the combined fuel mixture control rod and the spark advance control rod. The fuel mixture control rod was connected to the carburettors and the spark advance control rod to the magneto and via a cross shaft to the magneto on the other side of the engine.
When the control levers were operated by the pilot, movement of the levers moved the control rod in one direction or the opposite, causing the run of control rods to ultimately operate the engine fuel mixture and spark advance control rods. This adjusted the fuel mixture at both of the carburettors and altered the firing of the spark plugs from both of the magnetos.

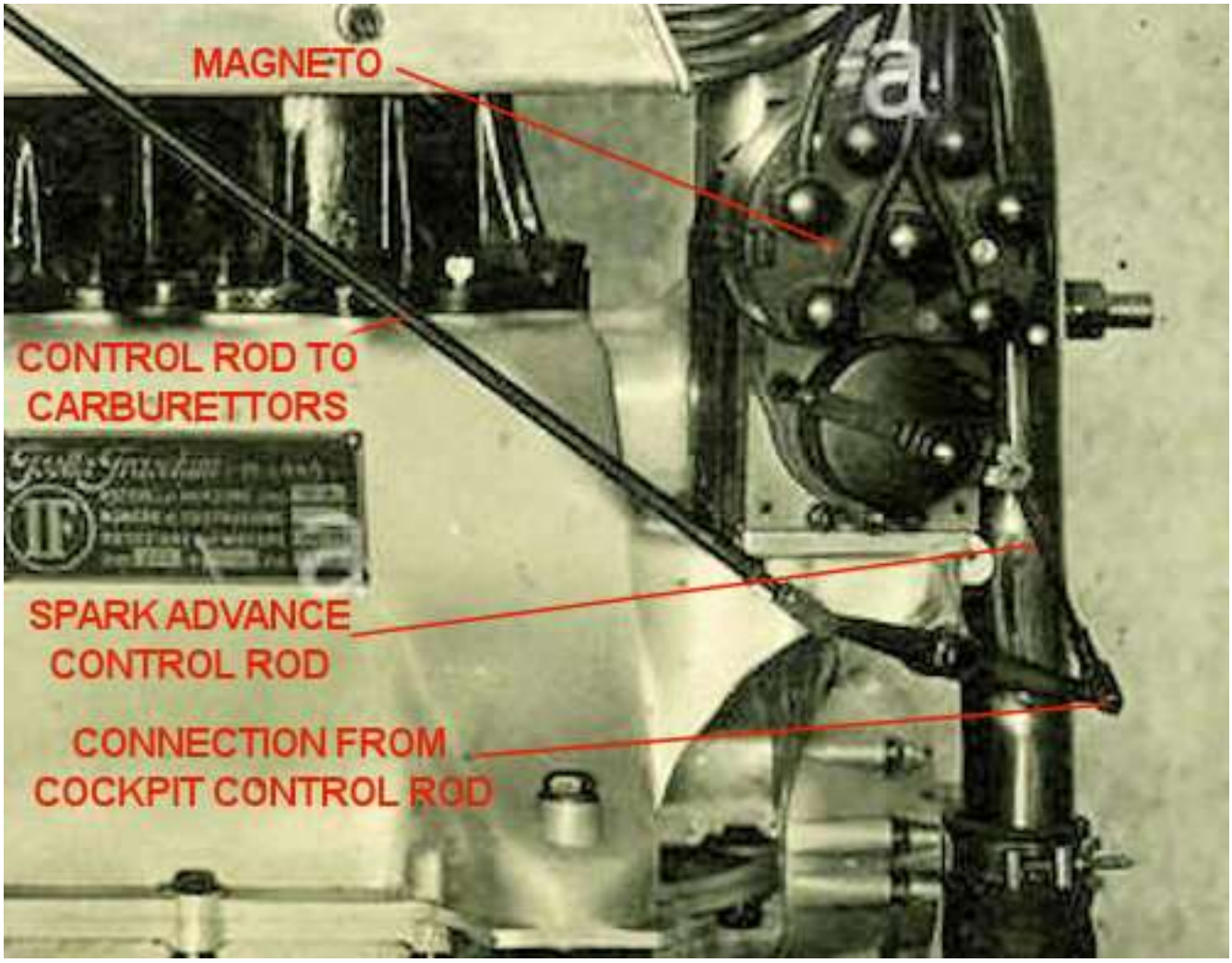


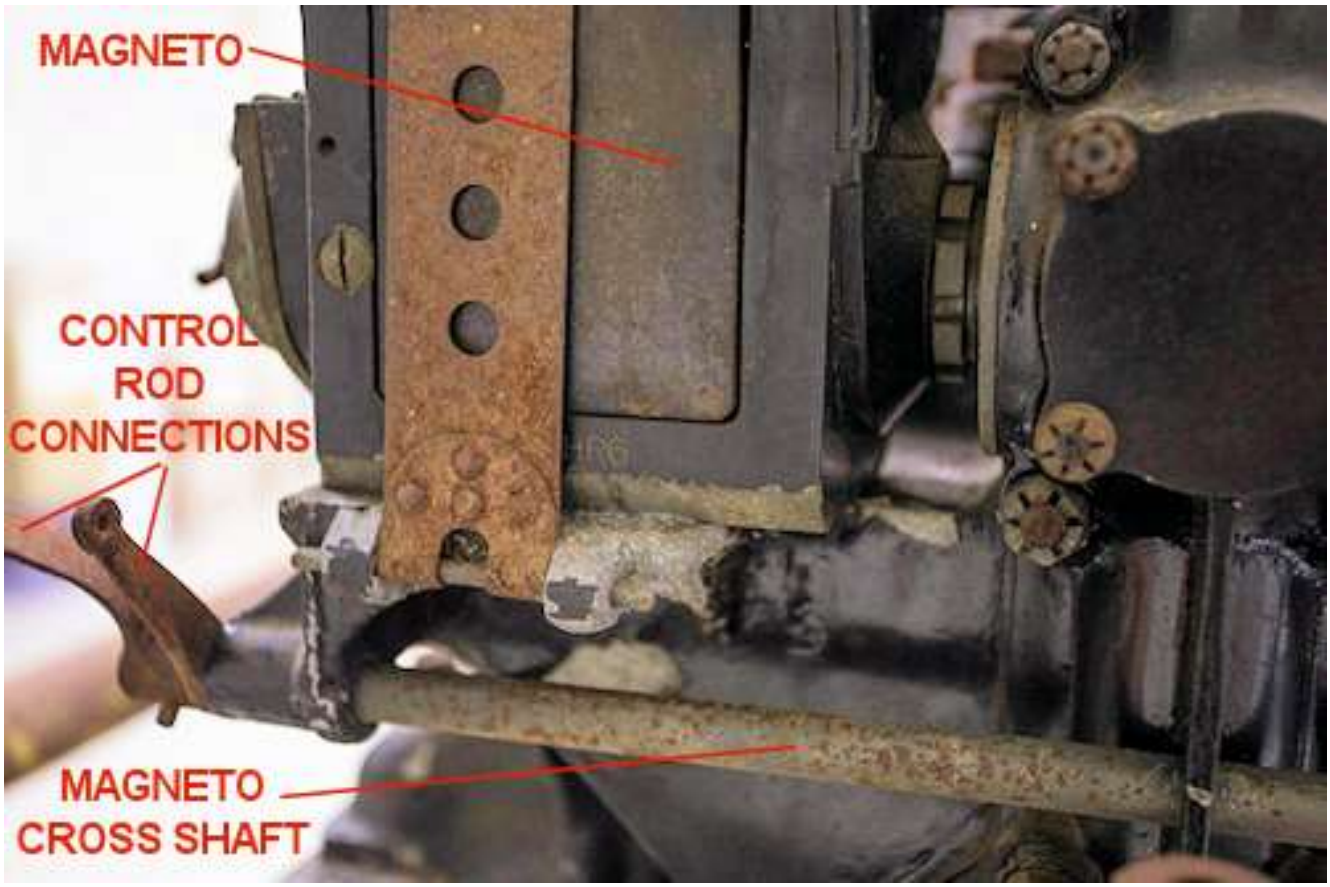

CONTROL ROD
TO ENGINE
COCKPIT LEFT
SIDE FRAME
COCKPIT REAR
FRAME
CONTROL CROSS
ROD
CONTROL ROD
FROM LEVERS


COCKPIT LEFT
SIDE FRAME
CONTROL ROD
TO ENGINE
FRAME
CONTROL
CROSS
ROD
LEVERS CONTROL ROD


CONTROL CAM
CONTROL ROD
TO ENGINE
PIVOT LEVER
RIGHT SIDE
ENGINE FRAME
CONTROL ROD
FROM COCKPIT


CONTROL ROD TO
ENGINE
CONTROL
CAM
PIVOT
LEVER
CONTROL ROD
FROM ENGINE
RIGHT SIDE
ENGINE
FRAME


MAGNETO
CONTROL ROD TO
CARBURETTORS
SPARK ADVANCE
CONTROL ROD
CONNECTION FROM
COCKPIT CONTROL ROD


MAGNETO
CONTROL
ROD
CONNECTIONS
MAGNETO
CROSS SHAFT

To represent the Fuel mixture and Spark advance controls:

NOTE 1: *Only the cockpit area will be modified at this stage in the build. The controls external to the cockpit will be added later in the build.*

NOTE 2: *Refer to the following photographs for guidance.*

Cut away the long rod from the resin throttle quadrant (part 33), as this is too thin and can easily be broken.

Secure the remaining levers quadrant to the cockpit left side frame using CA adhesive.

Cut a length of 0.4 mm diameter tube (‘e.g. ‘Albion Alloy’s’ MBT04 or similar).

Trim the length of the tube so it fits between the bottom of the levers quadrant and pre-moulded cross rod on the cockpit rear bulkhead.

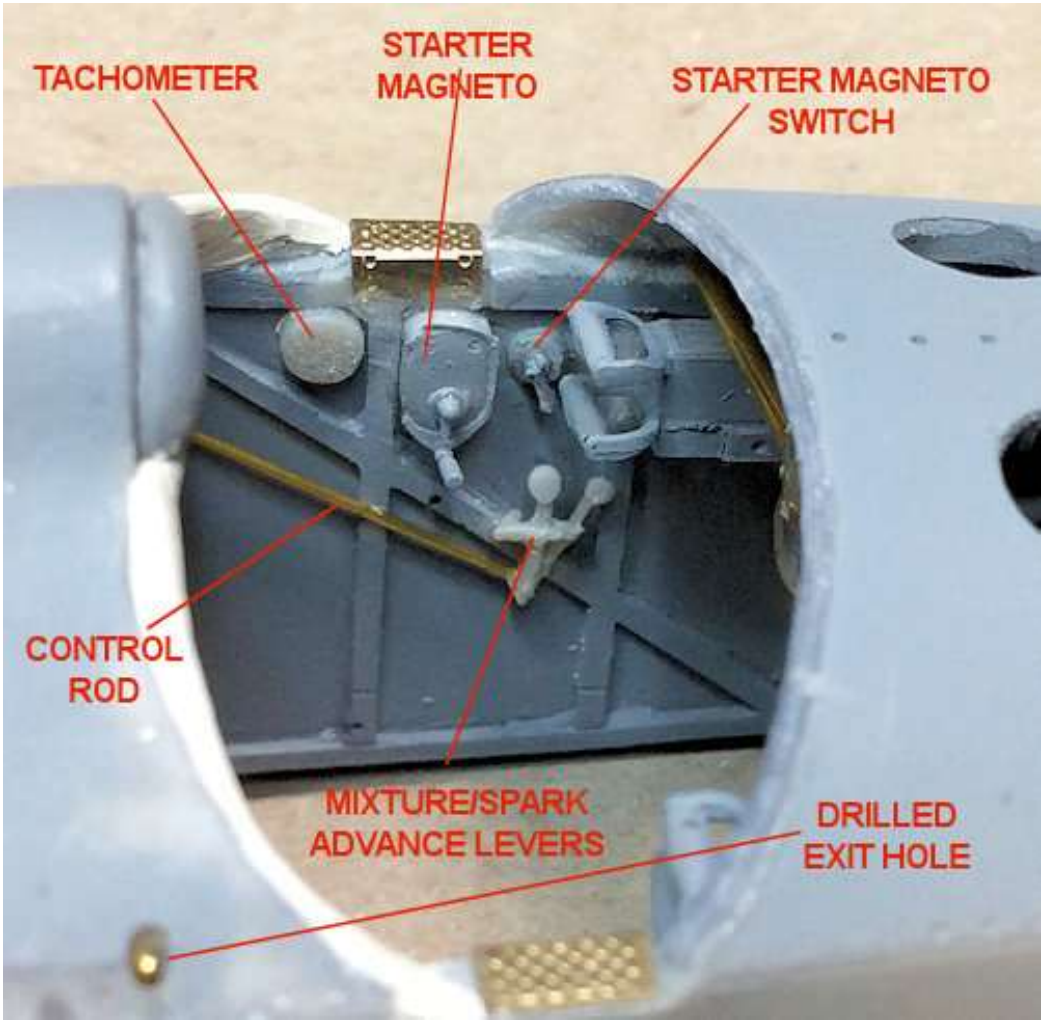
Secure the tube in position using CA adhesive.

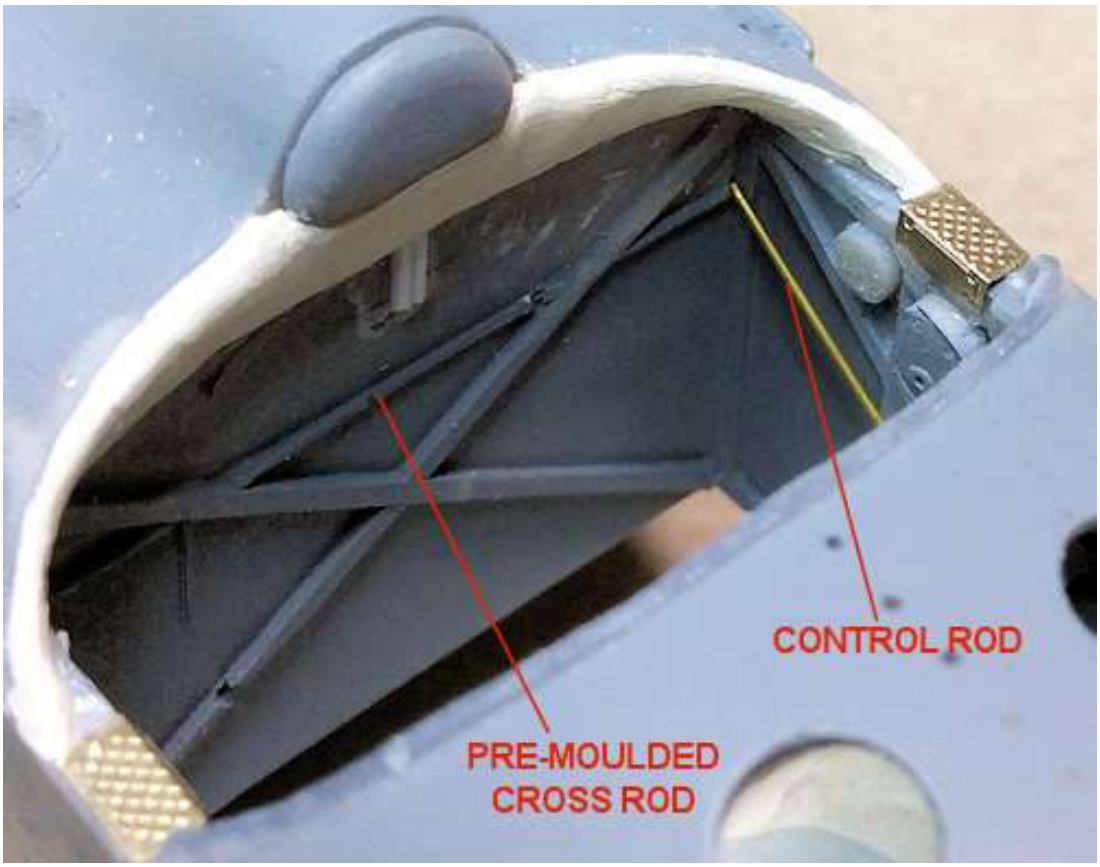
At the opposite side of the cockpit rear bulkhead, chisel away the resin frame in the top corner. Remove the frame upwards from the pre-moulded cross rod.

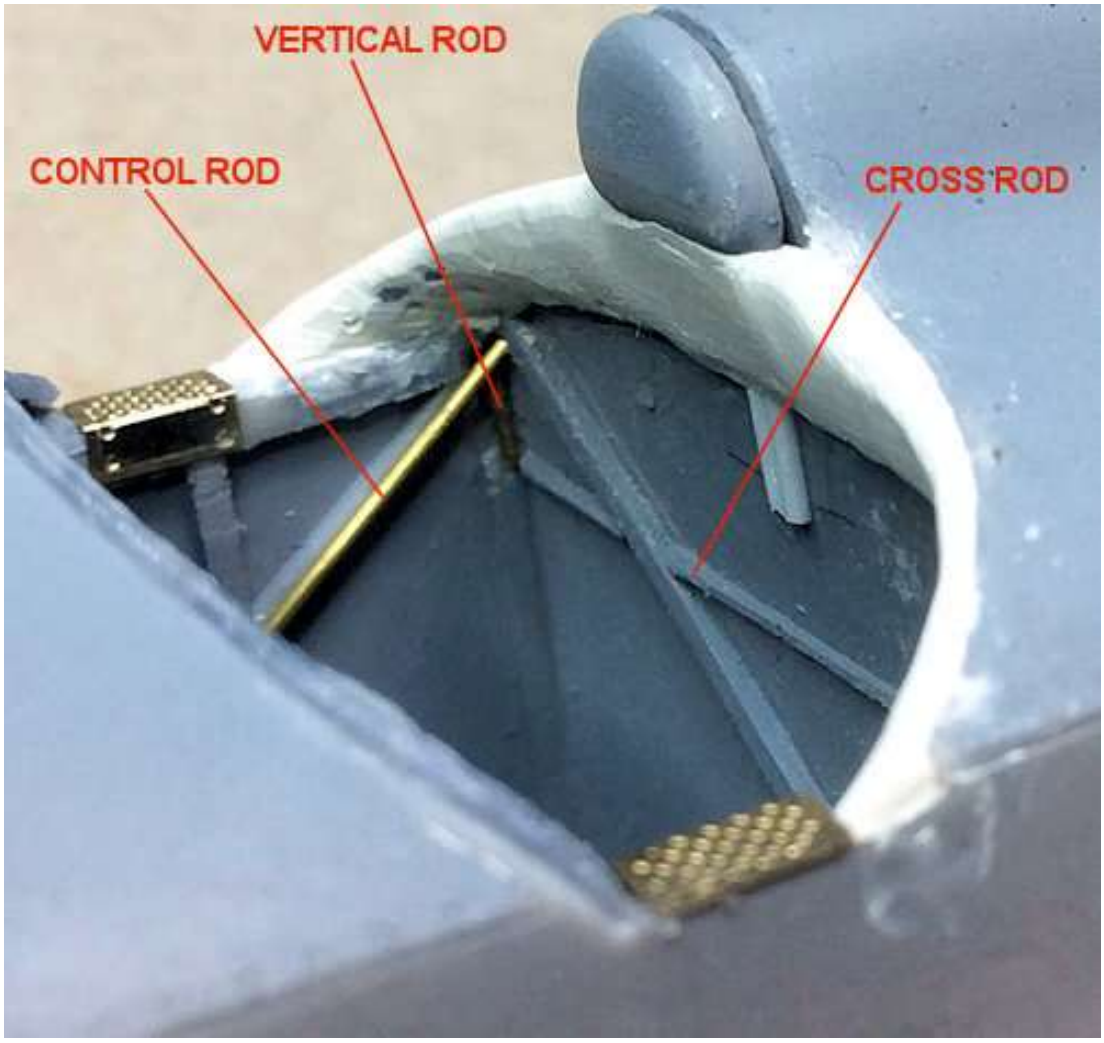
Drill a hole of 0.8 mm diameter through the fuselage, vertically down into the cockpit to align with the chiselled out corner.

Cut a short length of 0.4 mm diameter tube (‘e.g. ‘Albion Alloy’s’ MBT04 or similar). The tube should be long enough to be able to be inserted into the drilled hole and align with the pre-moulded cross rod, but be just below the top of the drilled hole.

Secure the tube in position using CA adhesive.




CONTROL ROD
PRE-MOULDED
CROSS ROD


VERTICAL ROD
CONTROL ROD
CROSS ROD

Half compression control:

A half compression control lever was located on the cockpit right side frame. The purpose of this control is uncertain.

To represent the Half compression control:

NOTE: *Only the cockpit area will be modified at this stage in the build. The controls external to the cockpit will be added later in the build.*

NOTE 2: *Refer to the following photographs for guidance.*

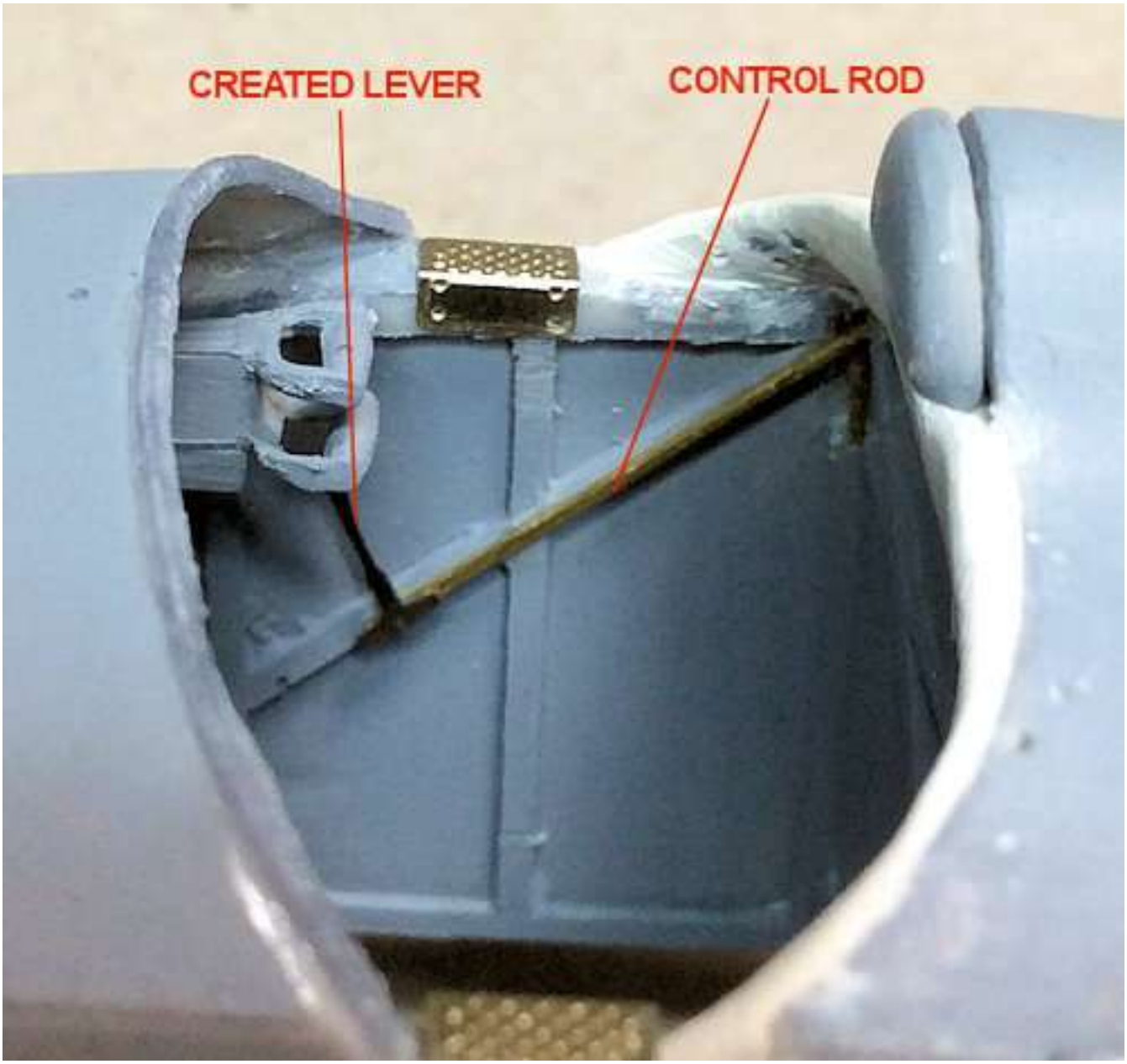
Create a suitable lever from 0.2 mm thick plastic card or use a lever from your 'spares'. I use a photo-etch lever from my 'spares'.

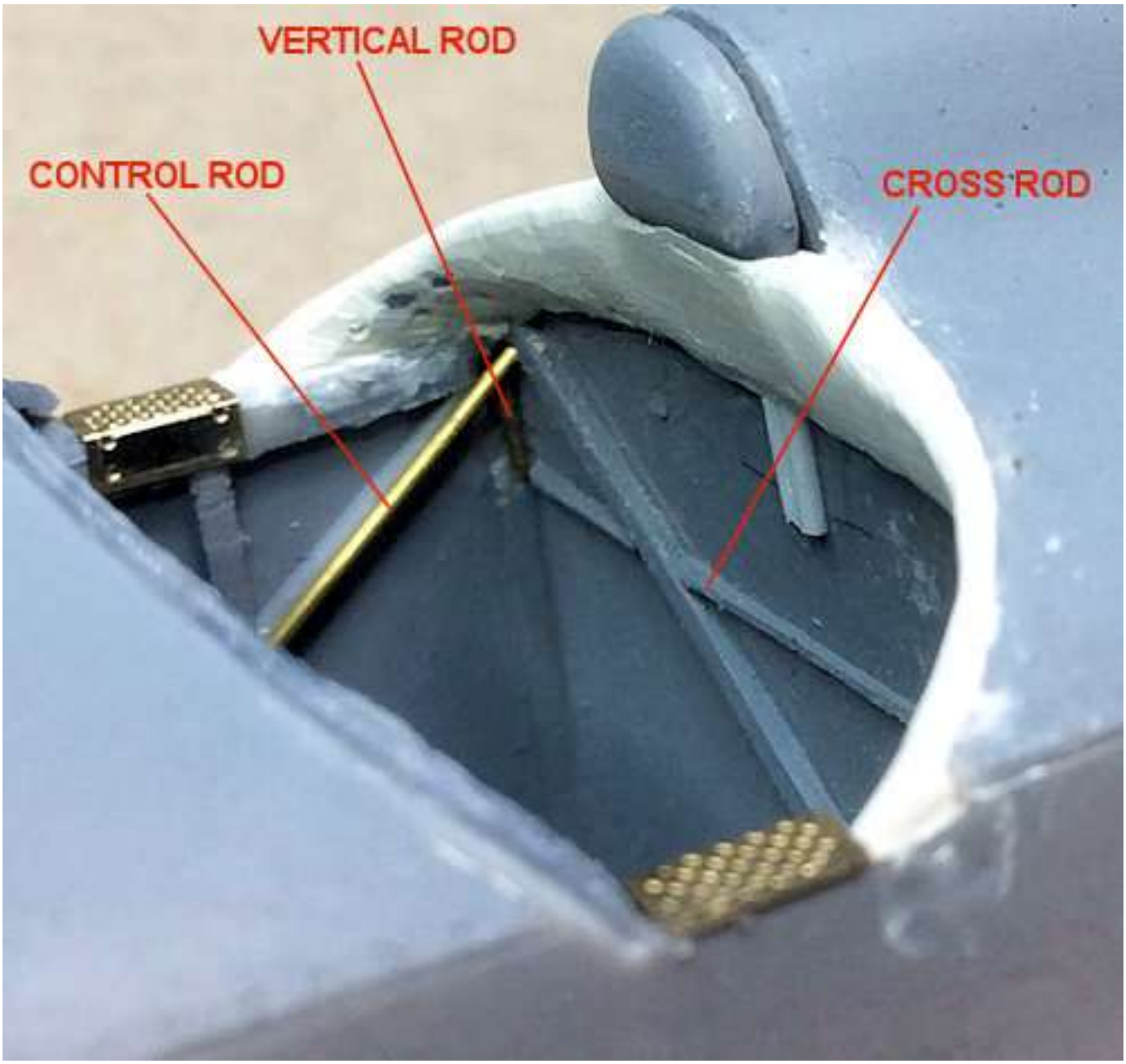
Cut a length of 0.4 mm diameter tube ('e.g. 'Albion Alloy's' MBT04 or similar).

Trim the length of the tube so it fits between the created lever and the chiselled corner of the cockpit rear bulkhead.

Secure the cut tube to the bottom of the created lever using CA adhesive.

Secure the lever/tube in position using CA adhesive.





Starter magneto and wiring:

A starter magneto was fitted to the left side frame of the cockpit and was operated by the pilot to pre-charge the engine ignition system. The kit does not supply this component so an aftermarket item was required - 'Taurus Model' 1:32 Magneto starter and switch (D3230b).

NOTE 1: *The wiring for the Starter magneto will be added after the painting of the cockpit is completed. The wiring external to the cockpit will be added later in the build.*

NOTE 2: *Refer to the following photographs for guidance.*

To represent the Starter magneto and its wiring:

Carefully separate the starter magneto and handle from the 'Taurus Model' set and clean up the cut faces and edges as necessary.

Secure the starter magneto in position on the cockpit left side using CA adhesive.

Secure the operating handle to the magneto using CA adhesive.

Magneto switch and wiring:

A magneto isolation switch was fitted to the left side frame of the cockpit as a safety switch to prevent inadvertent operation of the engine ignition system. It was switched by the pilot during the engine start sequence. The kit does not supply this component so an aftermarket item was required - 'Taurus Model' 1:32 Magneto starter and switch (D3230b).

To represent the Starter magneto switch and its wiring:

NOTE: *The wiring for the switch will be added after the painting of the cockpit is completed.*

Carefully separate the magneto switch from the 'Taurus Model' set and clean up the cut faces and edges as necessary.

Secure the starter magneto in position on the cockpit left side using CA adhesive.

Secure the switch lever to the switch using CA adhesive.

Tachometer:

The engine Tachometer gauge was located on the left side frame of the cockpit and gave the pilot indications of the engine speed. The gauge was connected to the engine by a drive cable which was turned in relationship to the rotational speed of the engine crank shaft.

To represent the Tachometer:

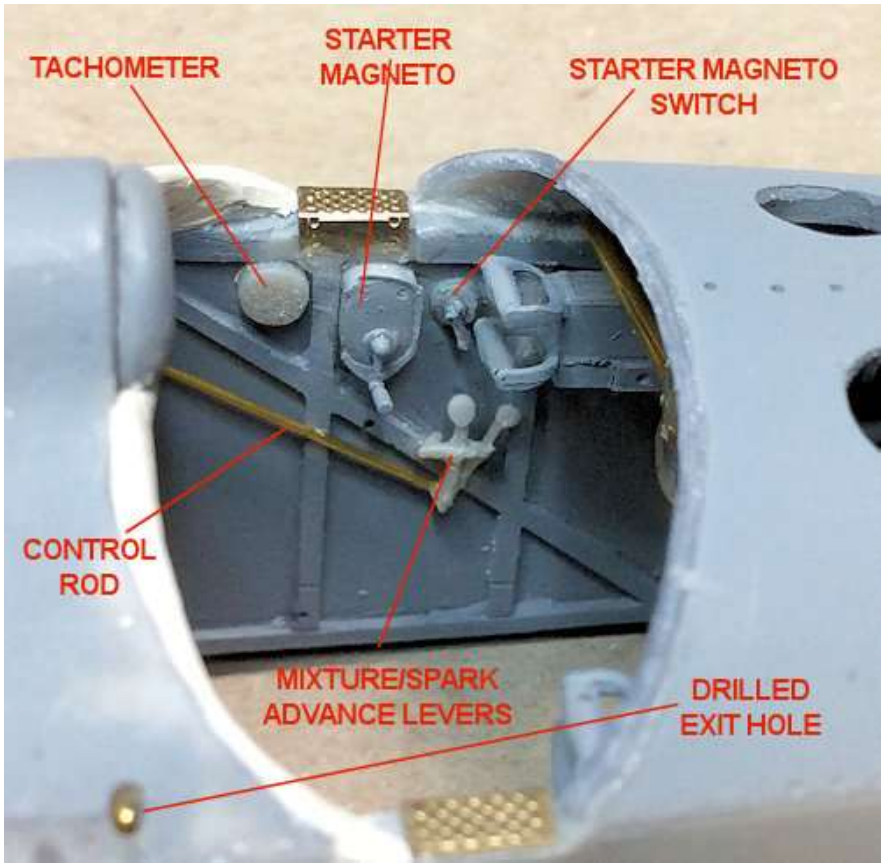
NOTE 1: *Only the cockpit area will be modified at this stage in the build. The tachometer drive cable external to the cockpit will be added later in the build.*

NOTE 2: *I felt the resin Tachometer supplied in the kit was slightly oversized and its body was too long. Therefore I chose to discard it and make a gauge from spare sprue.*

NOTE 3: *Refer to the following photographs for guidance.*

Cut a piece of kit sprue of approximately 2.5 mm diameter and 2.5 mm deep.

Secure the sprue in position (see following photograph) on the left side of the cockpit, using CA adhesive.



Control column - trigger levers:

The kit supplied photo-etch control column triggers (PE5 and 16) for the two machine guns are too flat and over sized. I discarded them and made a representation of the triggers instead.

Cut a short length of 0.3 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT03 or similar).

Bend the tube around a 1.0 mm diameter rod to form a ‘U’ shape.

Hold the semi-circular bend of the tube then bend the two ‘legs’ at 90 degrees.

Trim the length of the two legs.

Position the created triggers onto the control column, below the hand grip and with the two legs facing forward.

Secure in position using CA adhesive.

Cockpit - painting and decals:

Before further modifications and assembly of the cockpit are carried out, the painting of the cockpit and its components should be done.

Make sure the cockpit area and all components are free from any surface defects.

Airbrush the cockpit area and all components with a grey primer (e.g. ‘AK Interactive’ Grey AK758 or similar).

Cockpit and components - primed and dry assembled

Airbrush the cockpit area, the instrument panel, cockpit foot boards and bottom of the fuselage/ seat assembly with 'Tamiya' Dark Yellow (XF60).

Refer to Part 2 (Wood Effects) of this build guide and apply your desired wood finish. I chose to use 'DecoArt Crafters Acrylic' (water based) oil paints - Burnt Umber, as the fuselage external wood colour is dark.

Airbrush several light coats of a semi-matte sealer (e.g. 'Alclad' Light Sheen ALC-311 or similar).

Using the following paints or equivalents, brush paint:

Rudder bar - Tachometer - Step plates (x2) - Starter magneto:
'Tamiya' Rubber Black (XF85)

Control column -**Instrument panel support bar** -**Instrument panel side supports - Climb indicator surround** - **Control rods** - **Starter magneto handle** - **Starter magneto safety switch lever - Forward bulkhead container - Control column gun trigger levers:**
'Mr. Colour' Stainless Steel (213)

Control column grip - **Pilot's seat cushion** - **Machine gun handles** - **Cockpit padding (front and rear)** - **Pilot's headrest:**
'Tamiya' Hull Red (XF9), highlighted with 'Humbrol' Leather (62)

Machine guns:
Mr. Colour' Iron (212), highlight by sponging with 'Tamiya' Weathering Master Set C (Silver)

Ammunition containers:
'Mr. Colour' Stainless Steel (213)

Instrument panel switch levers (x2) - **Starter magneto safety switch:**
'Mr. Colour' Brass (219)

Climb indicator strip:
'Tamiya' White (XF2)

Fuel mixture/Spark advance levers - **Half compression lever :**
'Mr. Colour' Stainless Steel (213), 'Tamiya' Hull Red (XF9)

Handles - (**Fuel mixture/Spark advance levers** - **Half compression lever**):
'Tamiya' Hull Red (XF9)

Decals:
NOTE: *The fuel contents and oil pressure gauges on the instrument panel were represented by the use of aftermarket decals, as was the Tachometer.*

Brush a clear sealer onto the two instrument recesses on the instrument panel and over the face of the Tachometer. Use 'Tamiya' Clear X22 or similar.

Cut out two appropriate sized fuel and oil gauges from the .'Airscale' Generic WW1 instruments (AS32) set to fit the faces of the gauges.

Cut out an appropriate sized Tachometer gauge from the .'Airscale' Generic WW1 instruments (AS32) set to fit the face of the Tachometer gauge.

Apply the decals to the instrument panel and Tachometer.

Apply 'MicroSol' setting solution to the dried decals.

Cockpit - assembly:
Once the cockpit and its components have been painted and decals applied, the assembly of the cockpit area can be carried out.

Secure the pilot's seat cushion onto the seat with CA adhesive.

Pass the straps of the two seat belts through the slots cut in the seat back. Position the seat belts and secure in position, using CA adhesive.

Locate the pilot's foot boards assembly into the two cut-outs in the seat supports with the forward cross member onto the cockpit floor and secure in position, using CA adhesive.

Locate the control column through the gap between the added seat supports and in position on the cockpit floor, using CA adhesive.

NOTE: *For guidance, refer to the photographs on pages 138 and 140.*

Secure the instrument panel assembly in position with CA adhesive. Insert between the sides of the cockpit forward decking and above the pre-moulded cockpit side frames.

Secure the two machine guns in position on the fuselage side walls, using CA adhesive.

Secure the metal container in position on the forward bulkhead, using CA adhesive.

Locate the two kit supplied instrument bezels over the two instruments on the panel and secure in position using 'MicroScale' Krystal Clear.

Locate a suitable sized instrument bezels from your 'spares' over the Tachometer decal and secure in position using 'MicroScale' Krystal Clear.

Fuel and oil pipes:

A fuel contents pipe from the fuel tank inside the fuselage behind the pilot was routed along the right side of the cockpit to the fuel contents gauge on the pilot's instrument panel. Additionally an oil pressure pipe from the engine was routed down and along the right side of the cockpit to the oil pressure gauge on the pilot's instrument panel.

To represent the oil pressure and fuel contents pipes:

NOTE 1: *Only the cockpit area will be modified at this stage in the build. The pipes external to the cockpit will be added later in the build.*

NOTE 2: *Refer to the photograph on page 140 for guidance.*

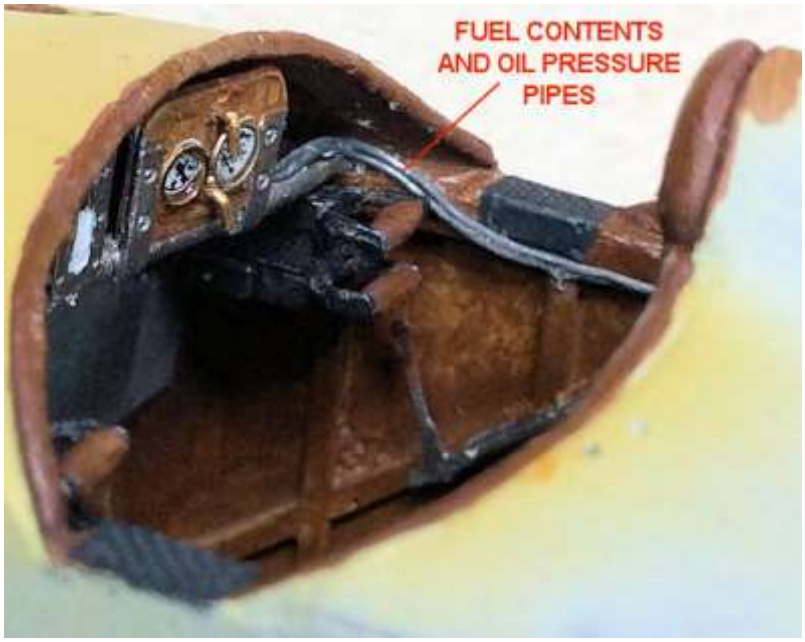
Cut two lengths of 0.3 mm diameter 'PlusModel' lead wire or similar.

Position one end of each behind the installed instrument panel and secure in position, using CA adhesive.

Carefully bend the wires together and across to the right cockpit side and along the side frame to the corner at the fuselage side/cockpit rear bulkhead.

Bend the two ends vertically up that corner, trimming to length.

Secure the wires in position using CA adhesive.



Rudder control cables:

The rudder control cables were attached to each side of the pilot's rudder bar in the cockpit and from there were routed rearwards, under the pilot's seat, through the fuselage to under the fuselage support fairing for the fin. The cables exited the fuselage and were routed below the tail plane and connected to the rudder horn at each side of the rudder. The control horn was fitted to the rudder post and below the actual rudder assembly. Moving the cockpit rudder bar left or right would pull on the rudder control horn, rotating the rudder post and therefore the rudder left or right.

To represent the two rudder control cables in the cockpit:

NOTE: *Refer to the photograph on page 140 for guidance.*

Cut two short lengths of 0.4 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's' NST04 or similar).

Cut two lengths of 0.12 mm diameter mono-filament (e.g. 'Steelon' mono-filament or similar).

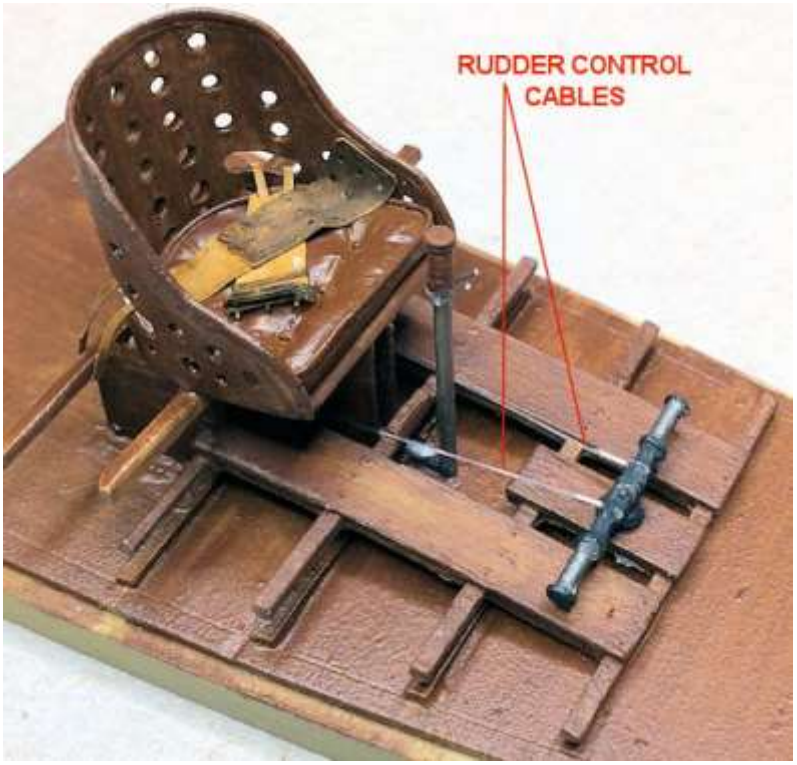
Secure one end of each line to the top of the rudder bar, close to the centre, using CA adhesive.

Slide the cut tubes onto the lines and secure them against the rudder bar, using CA adhesive.

Pass the other end of the two lines through the pilot's seat support frame (if necessary drill a small hole through the sides under the seat).

Gently pull the lines taut and secure them onto the cockpit floor under the pilot's seat, using CA adhesive.

Cut away the excess lines.



Aileron control cables:

The pilot's control column was connected to a torsion bar which was routed rearwards under the pilot's seat. At the rear end of this bar was a bell crank with an aileron control cable connected to each side of the bell crank. These control cables were routed up and out of the fuselage through apertures in the fuselage rear decking, at each side behind the pilot. From here the cables were routed up and into the underside of the upper wing. The cables were routed around pulleys and outboard to other pulleys, which turned the cables rearwards and out of the wings upper and lower surfaces to the upper and lower control horns on the ailerons.

NOTE: *The two aileron control cables will be fitted later in the build.*

Tachometer drive cable:

Although a Tachometer was fitted to the left side of the cockpit, There is no information available as to where the drive cable was routed between the engine and the Tachometer. The opposite side of the cockpit has the engine control rods and fuel/oil pipes fitted, which are routed up and out of the cockpit and up the to the engine on the forward support strut. Therefore I'm assuming the Tachometer drive was routed to the same strut.

To represent the Tachometer drive cable:

Cut a short length of 0.3 mm diameter 'PlusModel' lead wire or similar.

Position one end on the rear side of the Tachometer and secure in position, using CA adhesive.

Carefully bend the wire up and back along the left cockpit side frame to the corner at the fuselage side/cockpit rear bulkhead.

Trim the wire to length and secure in position using CA adhesive.

Starter magneto and switch - wiring:

The starter magneto would have been routed to the engine magnetos. Therefore I'm assuming the wiring was routed up and out of the cockpit and up the to the engine on the forward support strut, along with the engine control rods, Tachometer drive and fuel/oil pipes.

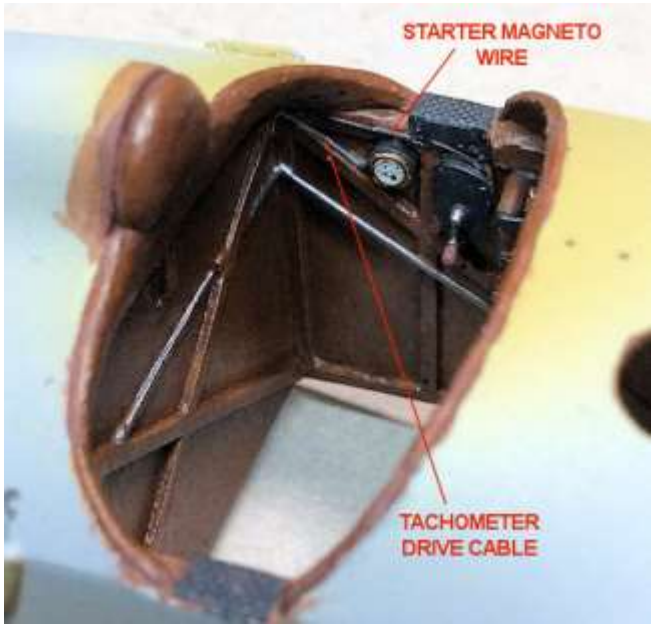
To represent the starter magneto wires:

Cut a short length of 'INIFI Model' 0.135 mm black rigging line.

Position one end on the forward side of the Starter Magneto and secure in position, using CA adhesive.

Route the line over the top of the magneto and rearwards along the left cockpit side frame to the corner at the fuselage side/cockpit rear bulkhead.

Trim the line to length and secure in position using CA adhesive.



Gun trigger cables:

NOTE: *Refer to the photograph on page 140 for guidance.*

Each of the two machine guns were fired by the pilot operating the gun triggers, located at the forward, top side of the control column. Each trigger was connected to its machine gun by a trigger cable.

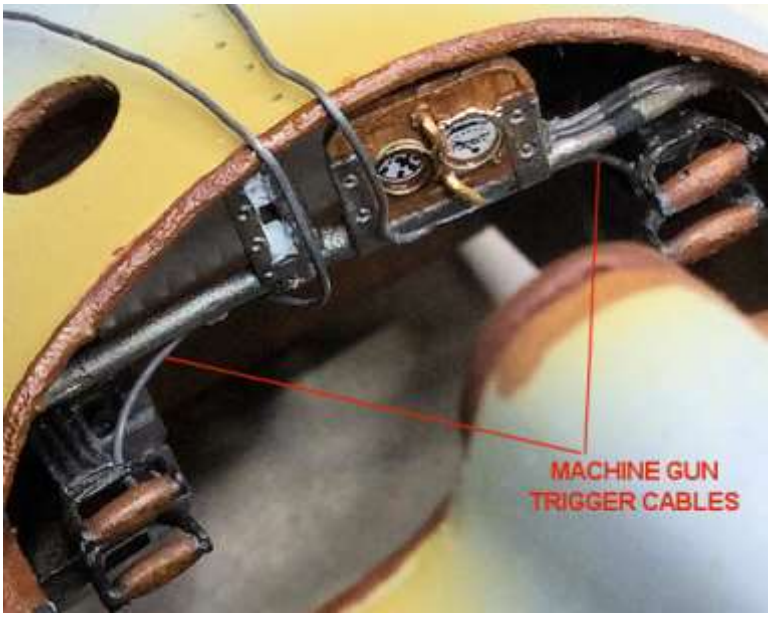
To represent the gun trigger cables:

Cut two lengths of 0.3 mm diameter 'PlusModel' lead wire or similar.

Position one end of each wire centrally on the inner side of the breech blocks of the two machine guns and between the gun handles. Secure in position, using CA adhesive.

Carefully bend the wires to loop them up to and under the instrument panel support bar and secure the wires in position using CA adhesive.

Carefully bend the wires up and forward over the fuselage decking. This will keep the wires out of the wat until the cockpit floor is fitted.



Weathering:

Airbrush a light coat of a semi-matte sealer (e.g. 'Alclad' Light Sheen ALC-311 or similar) to seal the applied paints.

Refer to Part 3 (Weathering) of this build log and apply a 'Flory Models' clay wash (Dark Dirt) over the painted components and assemblies.

Leather finish:

Brush paint a light coat of 'Tamiya' Semi-Gloss Clear (X35) over:

The leather padding and head rest around the cockpit rear edge.

The rim padding around the front edge of the cockpit.

Pilot's seat cushion.

Control column hand grip.

Window ports:

The two window 'ports' in the decking panel, forward from the cockpit, were prepared earlier in this build. Now painting of the cockpit and its components has been carried out and before the cockpit floor/lower hull is fitted to the fuselage, the window 'ports' should be completed.

To represent the windows of both 'ports':

Cut a strip of thin, clear acetate. The acetate strip should be wide enough to cover both 'ports' and long enough to span the underside of the 'ports' with the ends located over the top of the installed machine guns.

NOTE: *During the next step, do not apply the CA adhesive too close to the edges of the two ports, otherwise adhesive may spread onto the visible area of the acetate.*

Apply a small amount of CA adhesive to both sides of the two ports.

Carefully insert the acetate strip and secure in position by pressing it down onto the applied CA adhesive. Make sure as much of the acetate strip as possible is in contact with the model surface. If necessary 'in-fill' the edges of the strip with CA adhesive. This will prevent seepage of the 'Krystal Clear' when applied.

From outside the fuselage, apply a layer of 'MicroScale' Krystal Clear into the openings of both 'ports'. Do not 'fill' the ports in case the acetate strip is not fully in contact with the model surface, in which case the Krystal Clear may drain past the strip.

Once the Krystal Clear has set and sealed the ‘ports’, further layers of Krystal Clear can be applied to fill the ports to flush with surface of the decking panel.

Cockpit - assembly (continued):
Final assembly of the cockpit can now be completed.

Make sure the two lead wires for the machine gun trigger cables are clear of the fuselage and cockpit floor mating faces.

Make sure all paint and primer is removed from the fuselage and cockpit floor mating faces.

NOTE: *Due to the curved shape of the fuselage/hull of this model, you may have difficulty in clamping the parts together after assembly. In this case you will have to hold the parts together by hand until the adhesive has set enough to maintain the joints.*

Apply CA adhesive along the mating faces on the bottom of the fuselage and over the mating faces at the nose of the fuselage and the flat ’keel’ area at the rear.

NOTE: *The cockpit floor assembly and its location in the fuselage may not be as precise as you might expect. This is due to the kit being resin and the limitations in moulding processes and also maybe due to slight warping or distortion, which can happen with resin parts.*

Locate the cockpit floor assembly into the fuselage and make sure it is fully in contact and aligned as best as possible.

Clamp or hold the cockpit floor in the fuselage until the CA adhesive has set enough to maintain the joints.

Once the adhesive has set, in-fill any obvious joint gaps with CA adhesive.

Sand along the joints and especially around the nose of the fuselage, as there may be slight mis-alignment between the fuselage and the installed cockpit floor.

Check for any remaining gaps or depressions and if necessary fill with CA adhesive or a modelling putty (e.g. ‘Perfect Plastic Putty’ or similar).

Final sand the joint areas and nose of the fuselage to a smooth, blemish free finish.

Airbrush a grey primer (e.g. ‘AK Interactive’ Grey-758 or similar) and once dry, check filled seams and re-fill, prime and re-check until the seam joint is not visible.

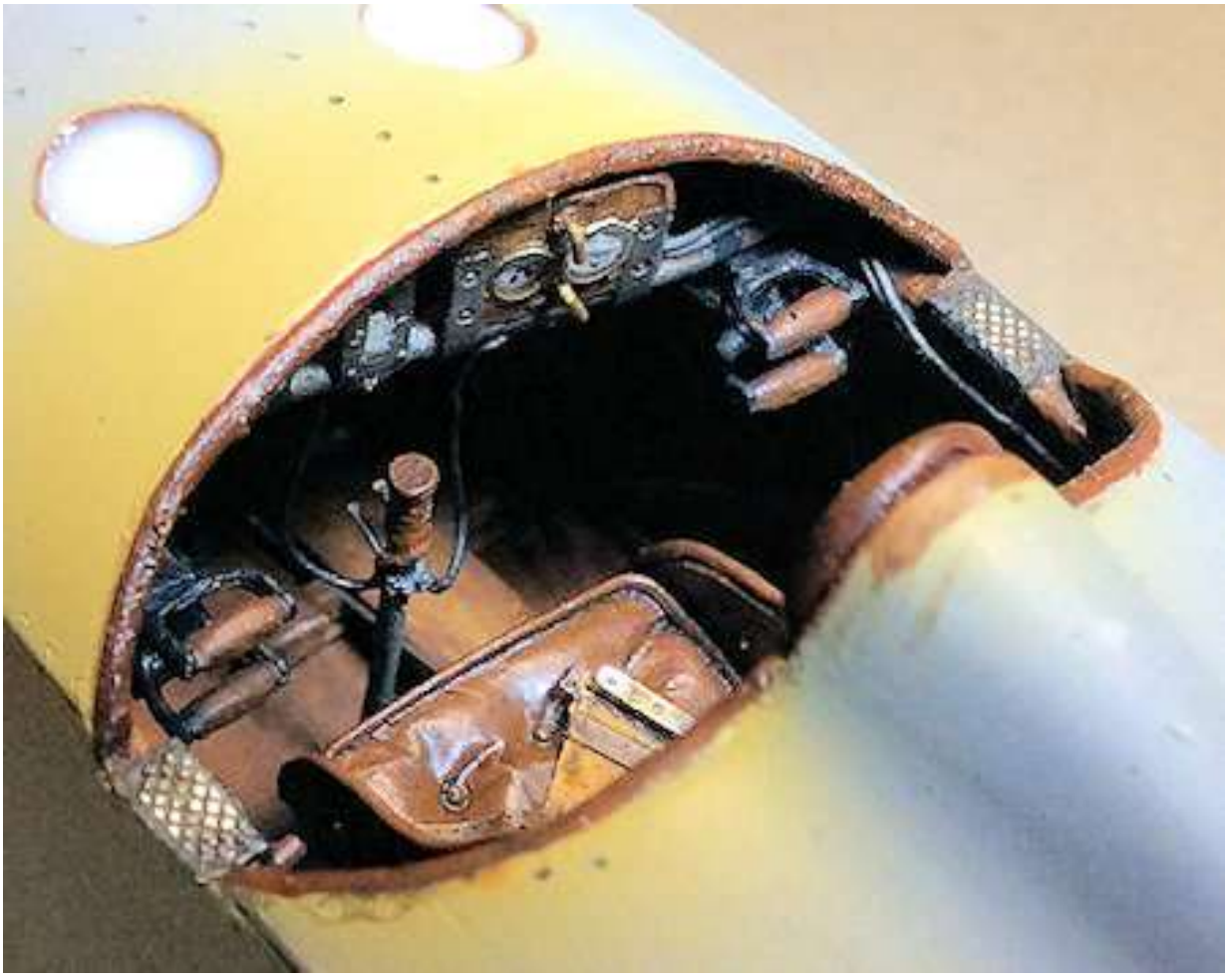
If there is still a fine seam line, apply by brush ‘Mr. Surfacer 1200’ in several layers. Once dry carefully wipe the excess away with ‘Mr. Colour’ levelling thinners.

Carefully manipulate each of the lead wires representing the machine gun trigger cables. Loop them down from where they are adhered to the instrument panel support bar and back up to the triggers on the control column.

Trim the lead wires to length.

Secure the lead wires to the control column triggers using CA adhesive.

NOTE: *In the following photographs, the ‘white’ discs’ is ‘Krystal Clear’ applied in the window ‘ports’. which hadn’t fully set and cleared when the photographs were taken.*



PART 10

CONSTRUCTION WITH MODIFICATIONS

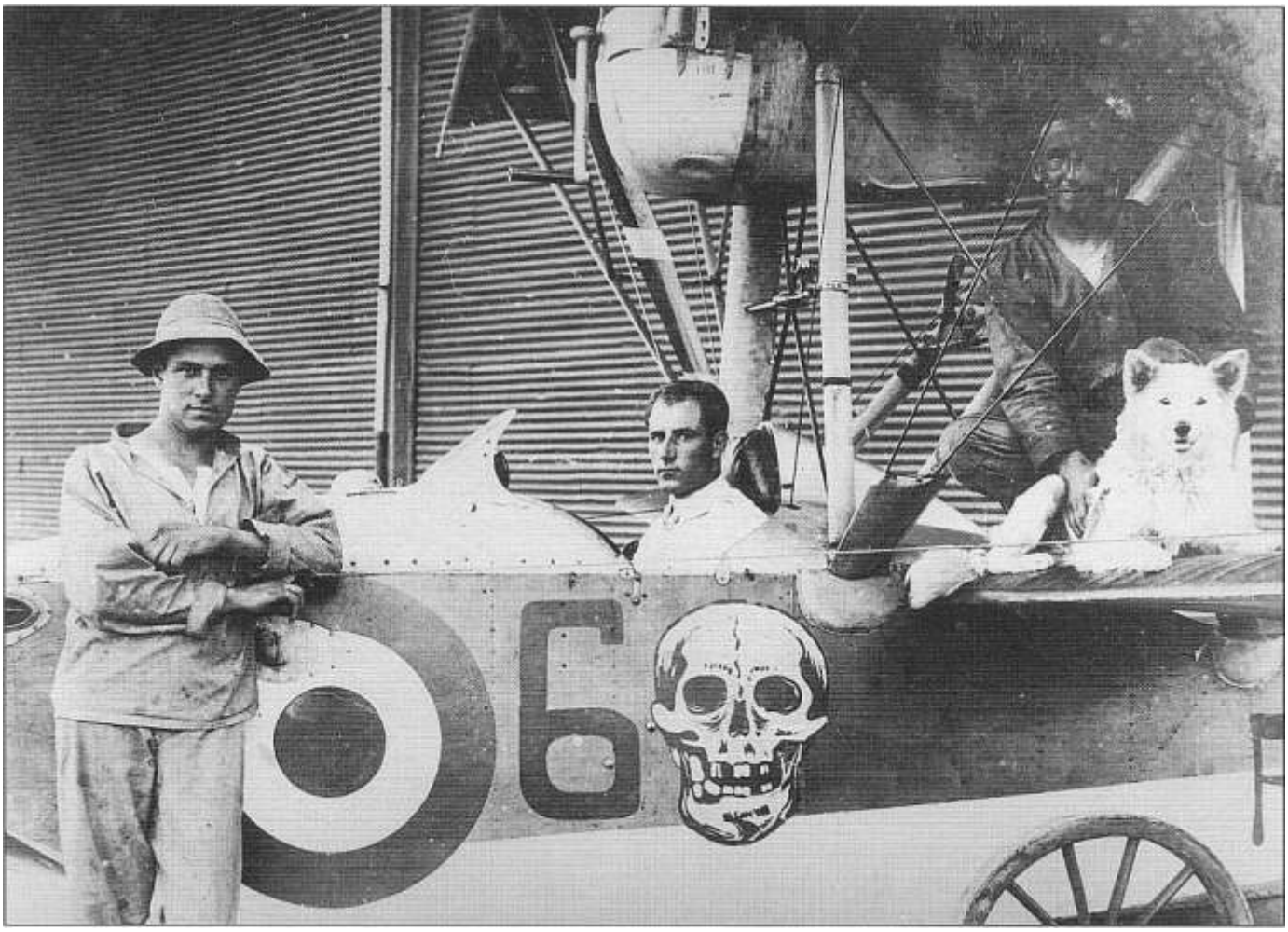
PART 10 - CONSTRUCTION WITH MODIFICATIONS

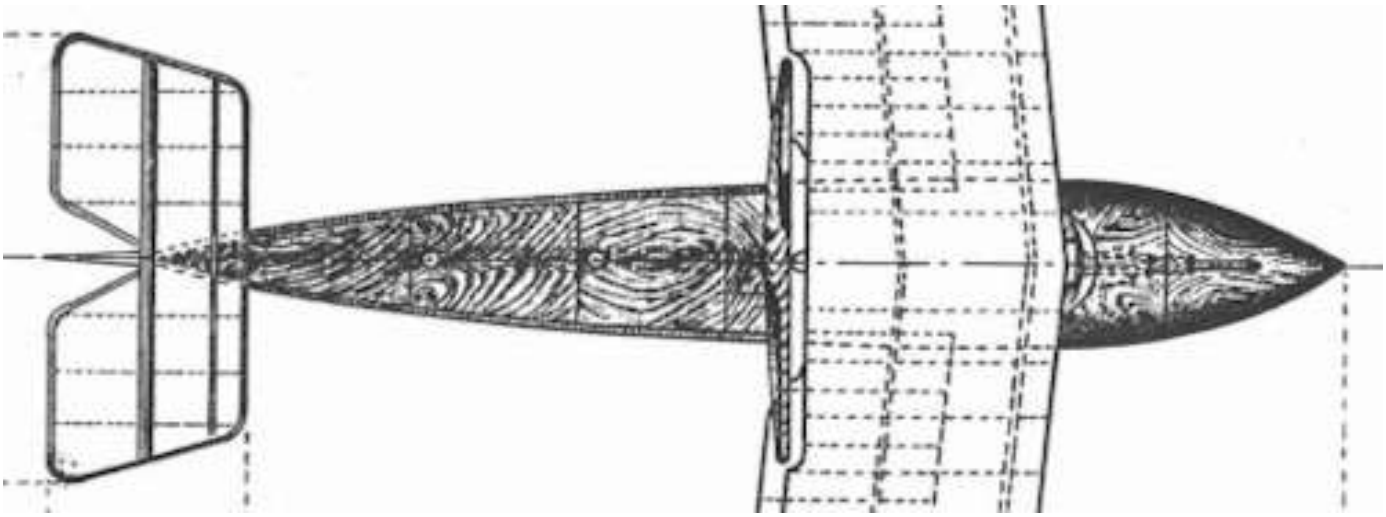
NOTE 1: *All assembly of all parts is carried out **using CA adhesive**.*

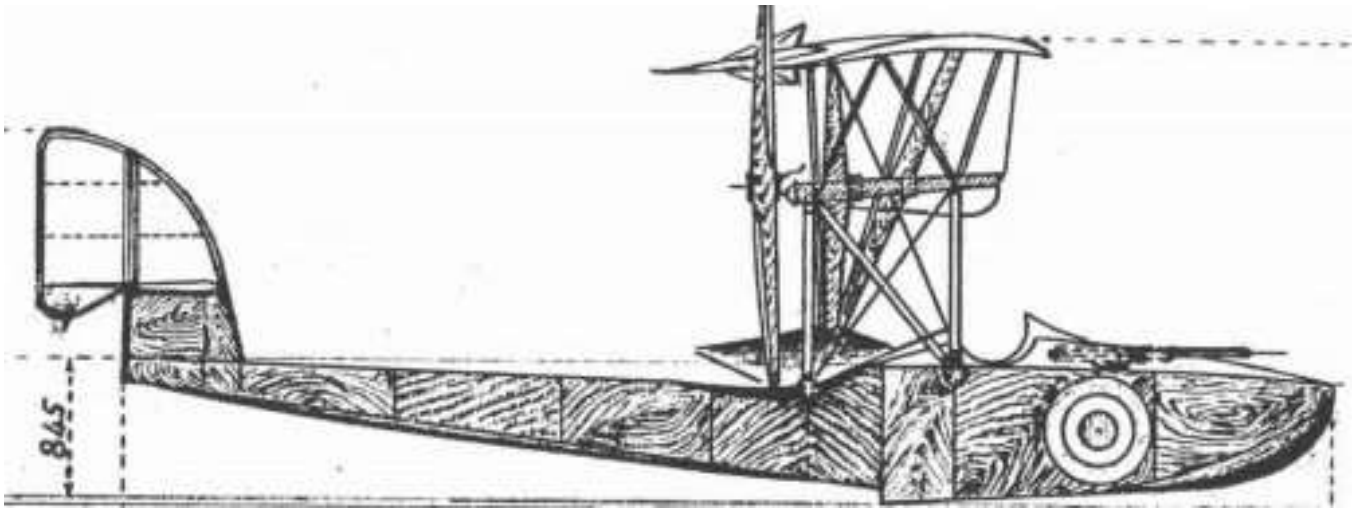
NOTE 2: *The following assembly does not follow the instruction manual, but is the order that I found best.*

Fuselage:

As can be seen on the following illustrations and photograph of the actual aircraft, the fuselage covering consisted of nailed marine plywood panels. The panels were treated against water penetration.







The resin fuselage of this model does not have these nailed panel lines. As the lower half of the fuselage and forward decking were painted, those areas would have less visible nail lines. .

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

Nailed wood panel lines:

Using the previous drawings as a guide, pencil mark the various nail lines.

Use an appropriate tool (e.g. 'Rosie the Riveter' 1.0 mm 1:32 spoked wheel tool) along the marked nail lines to represent the nail lines.

Use a pencil rubber to remove the drawn pencil guide lines and lightly sand the lines to remove lifted resin.

Clean the surfaces using alcohol wipes or similar.

Metal panel screw lines:

Use an appropriate tool (e.g. hollow point riveting tool or similar), mark screw 'heads' around the two fuselage gun barrel ports and the two rigging plates.

Lightly sand the screw heads to remove lifted resin.

Clean the surfaces using alcohol wipes or similar.

Fuselage - painting:

Mask off the cockpit and the two window 'ports'.

Airbrush the fuselage with a white primer (e.g. 'AK Interactive' White AK759 or similar).

Lightly sand the primed surfaces to remove any roughness and to create a smooth finish.

Airbrush a light sealing coat over the entire fuselage (e.g. 'Alclad' Light Sheen ALC –311, 'Tamiya' Semi Gloss X35 or similar).

Wood panels:

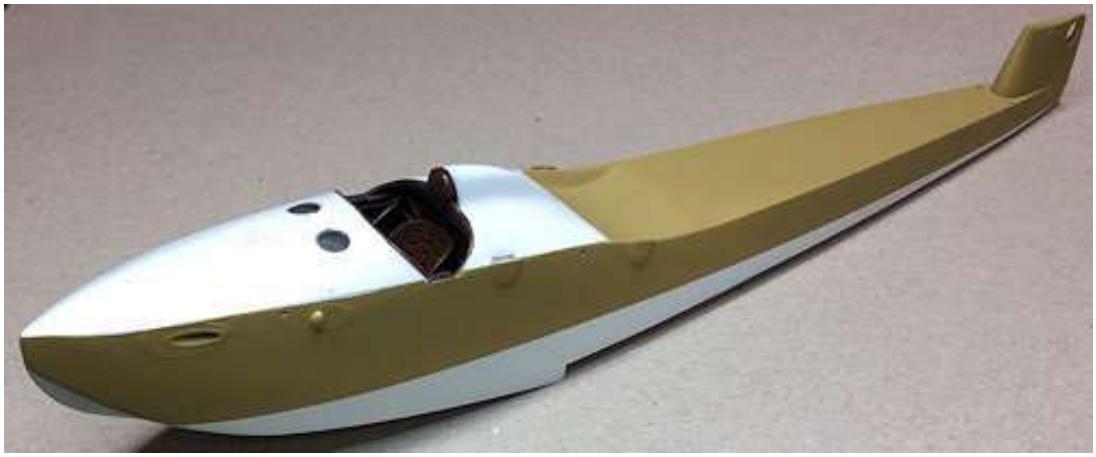
NOTE 1: *Applying a base colour for the wood panels is necessary before applying an oil paint wood effect. This base coat will show through slightly and enhance the grain of the wood.*

NOTE 2: *The fuselage was covered with single lengths of varnished plywood, secured in position by nailing the wood to the internal structure of the fuselage. The grain of the woof was horizontal along the fuselage (with the airflow).*

Refer to the kit colour instructions - **Fully mask** off all white required areas (lower fuselage, cockpit forward decking and decking behind the cockpit.

Airbrush 'Tamiya' Dark Yellow (XF60) over the wood panel areas.

Carefully remove all applied making, to lessen the possibility of tape residue contaminating the model surface and the chance of it lifting paint from the model if left on for too long.



Once dry, mask off all white required areas (lower fuselage, cockpit forward decking and decking behind the cockpit.

Refer to Part 2 (Wood Effects) of this build log and apply the desired wood effect. I chose to use ‘DecoArt Crafters Acrylic’ (water based) oil paint (Burnt Umber). It’s best to initially apply the oil paint with a larger brush or a piece of sponge, then if necessary using a ’fan’ brush, lightly brush to create a wood grain effect. *This needs to be carried quickly as the oil paint is fast drying.*

Carefully remove all applied making, to lessen the possibility of tape residue contaminating the model surface and the chance of it lifting paint from the model if left on for too long.

Once dry, mask off all white required areas (lower fuselage, cockpit forward decking and decking behind the cockpit.

Airbrush a light sealing coat over the wood effect areas fuselage with a semi-matte sealer (e.g. ’Alclad’ Light Sheen ALC-311, ‘Tamiya’ semi gloss X35 or similar), with a few drops of ‘Tamiya’ Clear Yellow (XF24) added, to give a varnished wood effect. Repeat if the first layer dries to a matte finish.

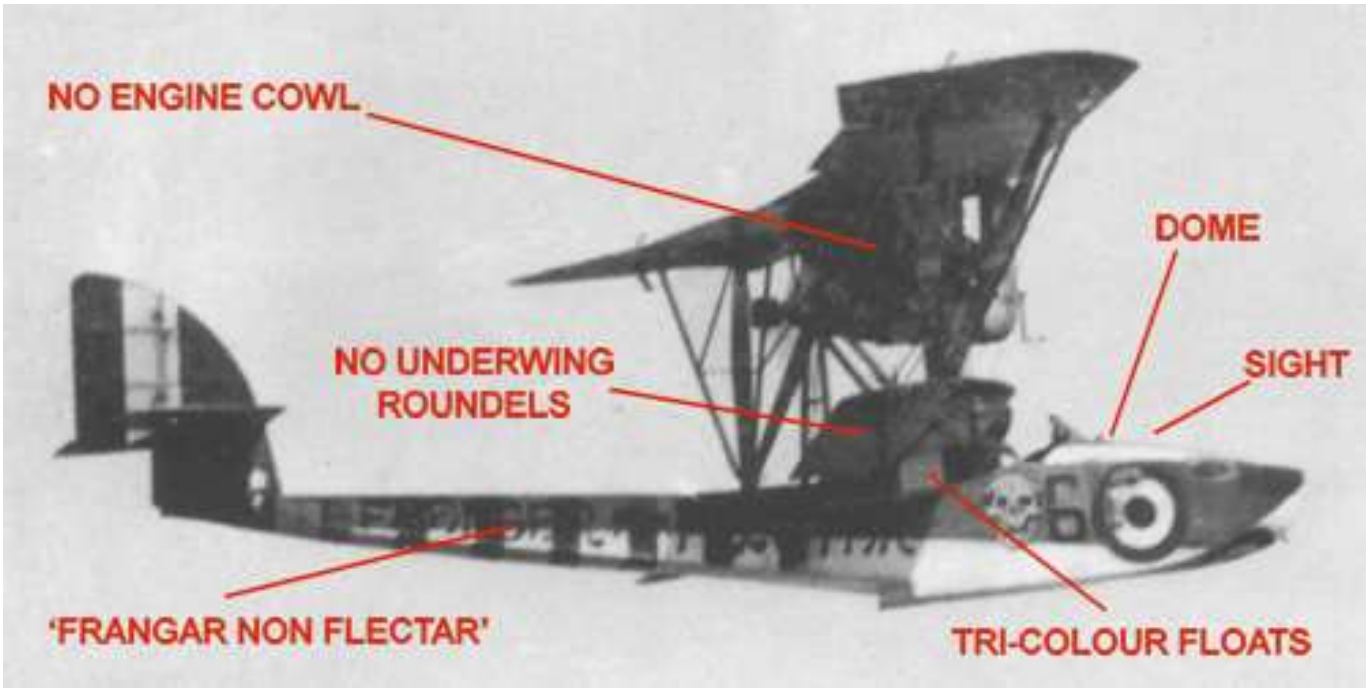
Airbrush a light sealing coat over the fuselage with a semi-matte sealer (e.g. ’Alclad’ Light Sheen ALC-311, ‘Tamiya’ semi gloss X35 or similar).

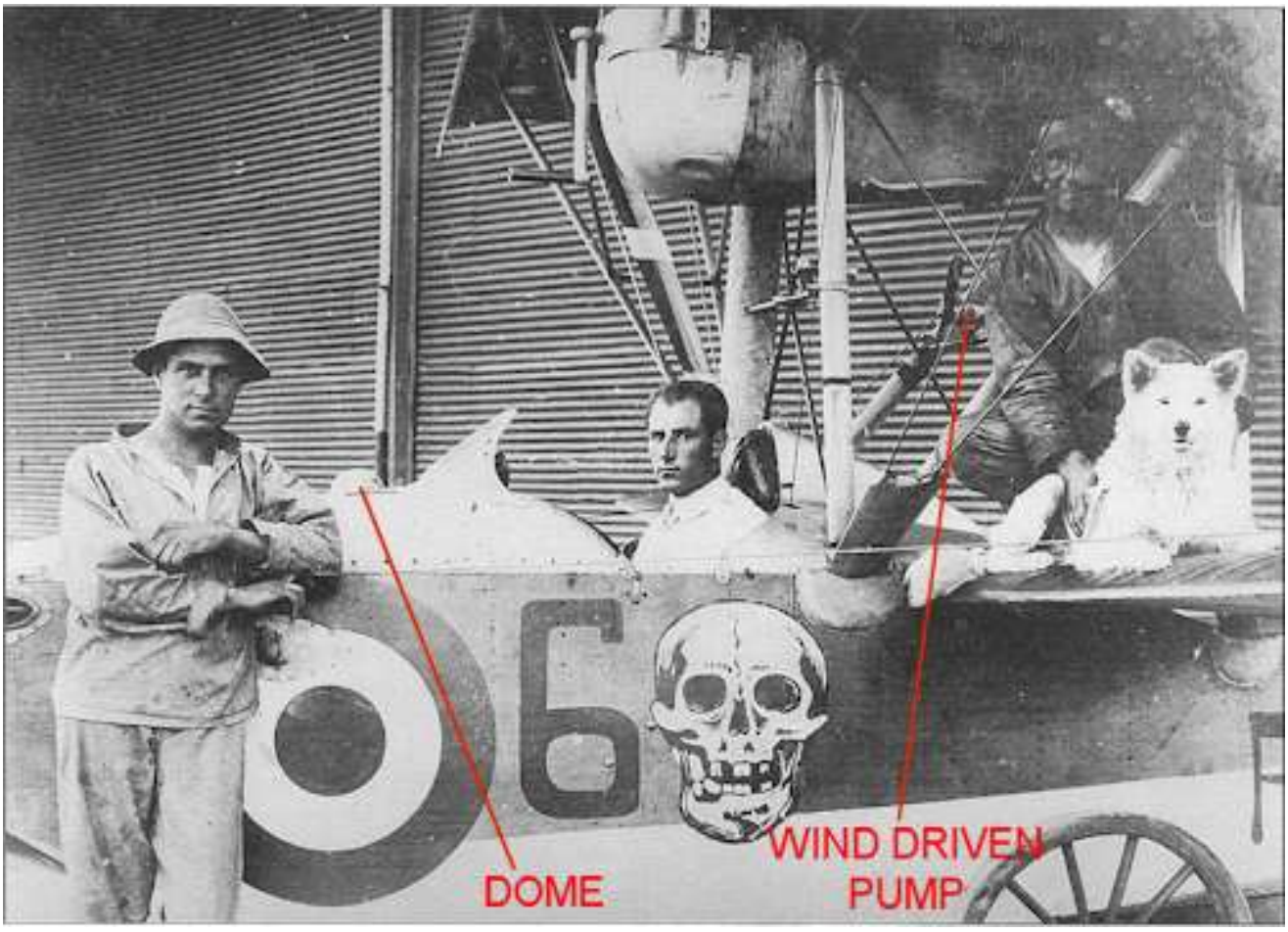
Carefully remove all applied masking, to lessen the possibility of tape residue contaminating the model surface and the chance of it lifting paint from the model if left on for too long.

<u>Compass binnacle:</u>

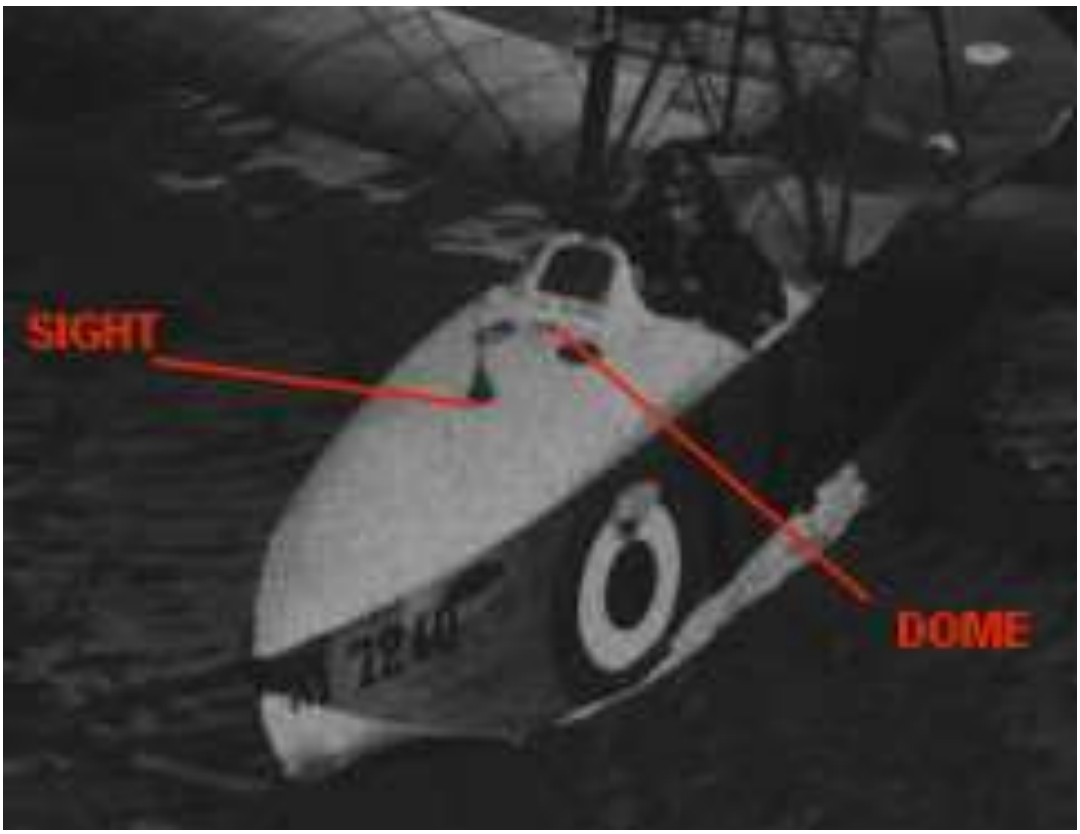
Many photographs of the cockpit decking, including of the aircraft being modelled, show what appears to be a ‘dome’ located between the two window ‘ports’, forward from the pilot’s windscreen. The purpose of this ‘dome’ in not confirmed, as it was not a standard fit on all Macchi M.5 aircraft. However it’s probable that the ’dome’ was in fact a type of binnacle housing a compass, which would make sense given the aircraft would have operated over the Adriatic Sea. That said, navigational landmarks would have been visible to the pilot’s as the Adriatic Sea was not considered an operational zone and many flights were carried out over land. Some binnacles had a convex glass front whilst others had protective sliding covers. Others had an internal mirror at the rear, which reflected the compass face enabling it to be seen from the pilot’s position.

The actual aircraft being modelled





Another example of a Macchi M.5



Examples of binnacles housing a compass

To represent the compass binnacle:

For the ‘binnacle’ I used a cockpit instrument from my ’spares’ collection.

Sand the instrument face to reduce the overall height.

Carefully cut instrument in half to create a semi-circle.

Using a round needle file, file into the flat (cut) surface to create a ’scalloped’ shape inside the ‘binnacle’.

Airbrush prime the ‘binnacle’ with a white primer (e.g. ‘AK Interactive’ White AK759 or similar).

NOTE: *For the next step mask the two window 'ports' in the cockpit decking.*

Brush a light sealing coat over the 'binnacle' location between the decking window 'ports' with a gloss sealer (e.g. 'Alclad' Aqua Gloss ALC-600, 'Tamiya' gloss X22 or similar).

Select an appropriate sized compass decal from the 'Airscale' Generic WW1 instruments (AS32) set.

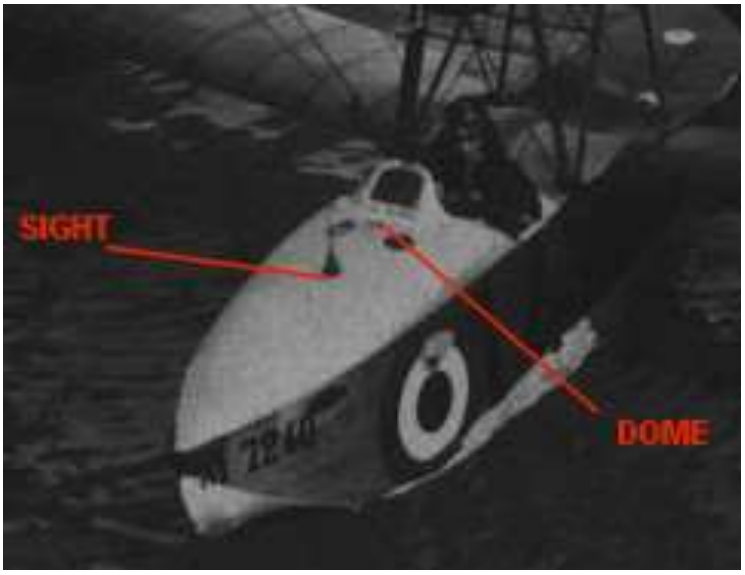
Apply the compass decal onto the cockpit decking location for the 'binnacle'.

Position the 'binnacle' over the decal with the cut-out facing towards the cockpit and secure in position, using CA adhesive.

To create the glass in the 'binnacle' carefully apply Vallejo' Still Water (26.230) until the cavity is filled.

Gun sight:

Many photographs of the cockpit decking show what appears to be a rudimentary gun sight.



To represent the gun sight:

For the gun sight I used another but smaller cockpit instrument from my 'spares' collection.

Sand the flat face to reduce the overall height.

Airbrush the 'dome with a white primer (e.g. 'AK Interactive' White AK759 or similar).

Secure the 'dome' in position centrally and forward from the two window 'ports', using CA adhesive.

Drill a hole of 0.3 mm diameter centrally into the top of the sight dome.

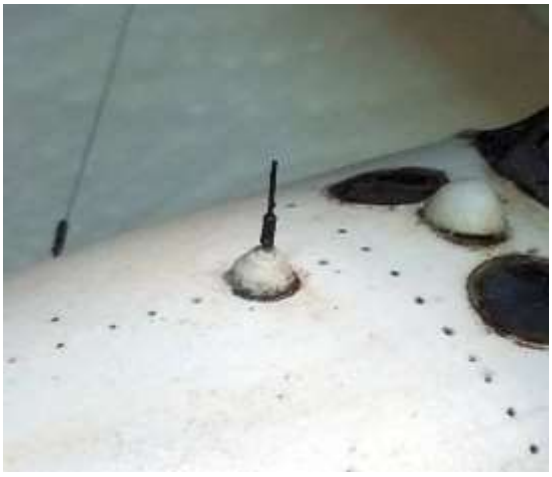
Cut a short length of 0.2 mm diameter Nickel-Silver rod (e.g. 'Albion Alloy's' NSR02 or similar).

Insert the tube into the drilled hole and secure in position using CA adhesive.

Cut a short length of 0.5 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's' NST05 or similar).

Slide the tube onto the 0.2 mm tube and secure in position using CA adhesive.

Brush paint the gunsight with 'Mr. Colour' Iron (212).



Pilot's windscreen:

Carefully cut the kit supplied windscreen from its base.

Sand the bottom mating face to obtain a good fit the decking on the fuselage (forward from the cockpit).

NOTE: *The kit supplied masks for the windscreen are not deep enough to cover the clear 'window' of the windscreen. Therefore additional masking will need to be cut to cover the bottom strip of the 'window (front and rear).*

Use the kit supplied masks to cover the clear area of the windscreen.

Airbrush prime the windscreen (e.g. 'Alclad' Gloss Black Base ALC-305 or similar).

Airbrush the windscreen (e.g. 'Alclad' Duralumin ALC-102 or similar).

Carefully remove the applied masking.

Position the windscreen on the fuselage decking and secure in position using a PVA (white glue) adhesive ('Micro' Krystal Clear or similar).

If the 'window' of the windscreen is not clear enough, carefully brush on aa acrylic gloss sealer (e.g. 'Pledge' Floor Care or similar).

Decals:

Airbrush a light coat of gloss sealer over the locations for the various fuselage decals, using a Gloss sealer (e.g. 'Alclad' Aqua Gloss 600, 'Tamiya' Gloss X22 or similar).

Apply the fuselage roundel under the front of the fuselage. To help the decal conform to the shape of the hull, you may need to slice the decal where it locates over the high point curve. Use a sharp curved scalpel blade.

NOTE: *To create the white decal backgrounds for the fuselage side roundels, I used a circle cutter ('ThinnerLine' circle cutter - see page 73) and white decal sheet.*

Cut two circles of white decal to the same size as the fuselage side roundels.

Apply the white circle decals to the fuselage sides.

Apply the two roundel decals on top of the white decal bases.

NOTE: *The two skull decals are predominately white and there need a white decal base, as for the roundels. Cute as close as possible around the skull decals then outline them onto the white decal paper. Then use a scalpel to cut out the skull shapes, making them slightly smaller than the kit decal (to avoid white decal showing at the edges).*

Refer to the kit colour instructions and apply the decals for the number 6, skulls and the M 7288 serial numbers. Smaller serial numbers were also located at the extreme rear of the fuselage.

These additional serial numbers are not supplied in the kit, but id desired, representations can be added by using similar decals from your 'spares'.

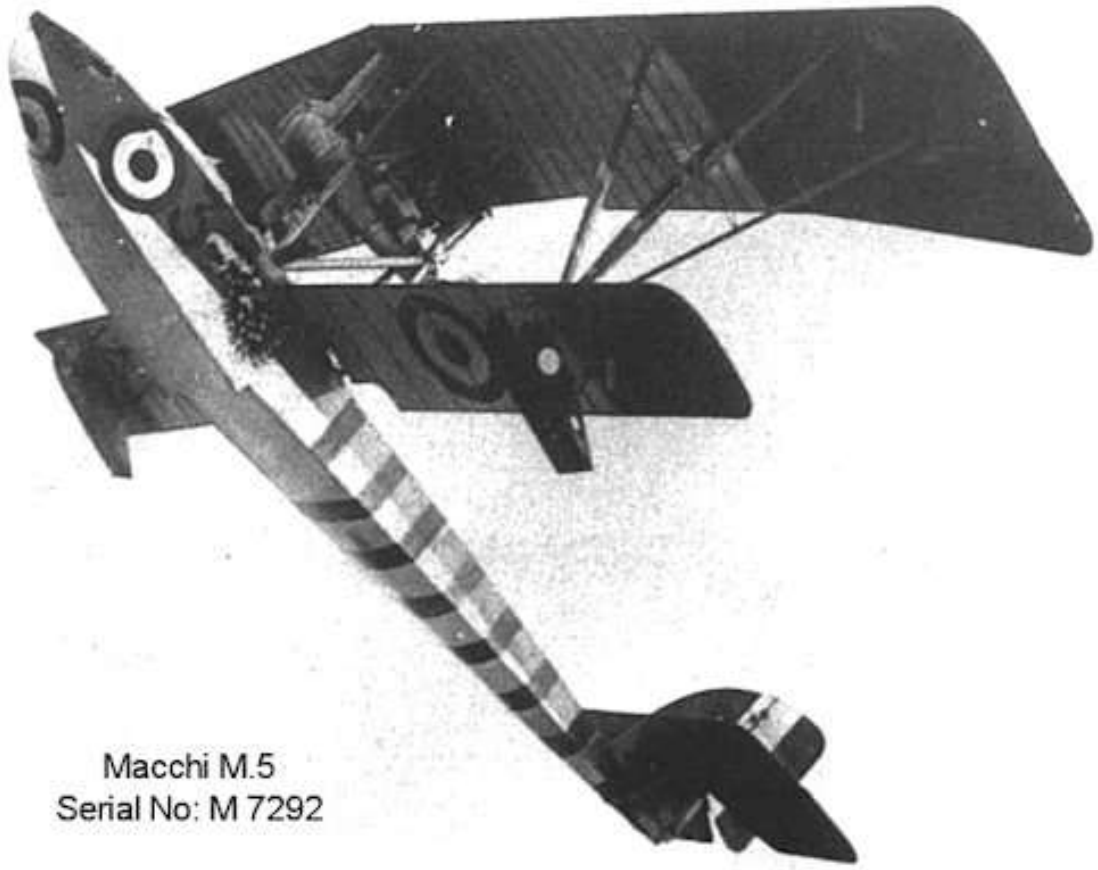
Check all decal edges and treat the decals with a decal solvent (e.g. 'MicroSol' or similar), to conform the decal to the surface contours.

Fuselage stripes:

This model depicts the Macchi M.5, Serial No. M 7288 of No.260a Squadriglla, operating from Venice during 1918. On the page following are photographs showing M 7288 in flight and also an in-flight photograph of Macchi M.5, Serial No: M 7292. Both aircraft operated with No.260a Squadriglla.

The colour illustrations in kit instructions show that the aircraft had alternate red and green stripes, equally spaced around the fuselage. The first (red) stripe appears to be located close to the curved recess in the top of the fuselage, which was necessary to clear the rotating propeller. The last fuselage stripe (green) was located slightly rearwards from the leading edge of the tailplane support fairing. The stripes were equally spaced along the fuselage.

Macchi M.5
Serial No: M 7288



Macchi M.5
Serial No: M 7292

However, when referring to the two photographs of the actual aircraft, it's evident that the M 7288 did not have the first two stripes (red and green) on the underside of the fuselage and M 7292 did not have the first (red) stripe on the underside of the fuselage . Either these stripes were never actually painted on these aircraft or if they were, the stripes had been gradually removed by contact with the beaching trolley or by water spray from the fuselage step at the rear of the 'keel' of the fuselage hull.
Therefore the first two stripes (red and green) on the fuselage underside of M 7288 will not be created.
With reference to the kit illustrations and the photographs, the first fuselage stripe (red) was located across the centre of the propeller recess on the top of the fuselage. The two fuselage side stripes continued down the lower edge of the fuselage, but were *angled slightly forwards at the bottom* so the stripes appeared vertical when the aircraft was in level flight.

<u>To represent the fuselage stripes:</u>

Refer to the kit colour instructions and lightly mark the centre location of the various stripes **on one side** at the underside edge of the fuselage. There are eight stripes in total, starting with a red stripe below the rear of the engine, then alternating to green and so on. From the first mark make sure the centre marks for each stripe are equally spaced.

For the first (under engine red stripe), mask all wood effects except where the fuselage stripe will be painted. Using the fuselage mark as a guide, make sure the masking for the stripe is correctly positioned on the fuselage sides and top only (this aircraft had no red stripe on the underside of the fuselage at this location). The width of the stripes should be approximately 5 mm.

Follow the same procedure to create the next rearwards (green) stripe, making sure the stripe masking is parallel to the red stripe (equally spaced) and is correctly positioned on the fuselage sides and top only (this aircraft had no green stripe on the underside of the fuselage at this location).

Continue in this way until all eight stripes are applied around the fuselage. The six remaining fuselage stripes were applied all around the fuselage (including the underside of the fuselage).

Make sure the areas between the stripes and any area that may be subject to airbrush overspray are masked.

Lightly brush 'Tamiya' White (XF2) to create white stripes.

Refer to the kit colour instructions and brush or airbrush the red stripes around the fuselage between the applied masking, using 'Tamiya' Red (X7).

Refer to the kit colour instructions and airbrush the green stripes around the fuselage between the applied masking, using 'Tamiya' Green (X5} mixed with approximately 15% of 'Tamiya' Grey Green (XF76).

Carefully remove all applied making, to lessen the possibility of tape residue contaminating the model surface and the chance of it lifting paint from the model if left on for too long.

Airbrush a light sealing coat over the stripes with a semi-matte sealer (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' semi gloss X35 or similar).

Engine strut fuselage mountings:

Brush paint the two engine support strut mounting on each side of the fuselage (visible under wood effect) with ‘Mr. Colour’ Aluminium (218) or similar.

Hatch panels:

Three photo-etch circular hatch panels are supplied in the kit. However these are very thin and easily bent and difficult to flatten without further damage. I chose not to use these photo-etch parts and instead used plastic card.

To represent the hatch panels:

Cut three discs from 0.2 mm thick plastic card to the same diameter as the photo-etch parts. I used a ‘ThinnerLine’ circular cutter (refer to page 73 of this build log).

Prime one side of each disc (e.g. ‘AK Interactive’ Grey AK758 or similar).

Brush paint the primed surfaces with ‘Mr. Colour’ Aluminium (218) or similar.

Cement the three discs onto the top of the fuselage over the pre-moulded hatch outlines.

Use an appropriate tool (e.g. hollow point riveting tool or similar) to mark the six fasteners around each disc (use the photo-etch parts as a guide for positioning).

Gun ports and barrels:

The Macchi M.5 was fitted with different configurations for the machine guns, but the most often seen in photographs taken at the time were two machine guns ('FIAT' Revelli), located at each side of the cockpit. The barrels of the guns protruded slightly from gun ports at the forward sides of the fuselage.

Cut two short lengths of 0.7 mm diameter tube (e.g. 'Albion Alloy's' MBT07 or similar).

Prime the two tubes (e.g. 'AK Interactive' Grey AK758 or similar).

Brush paint the two tubes with 'Mr. Colour' Iron (212).

Lightly 'dry' brush the forward ends of each barrel with 'Tamiya' Rubber Black (XF85).

Brush paint the two gun port panels and the two rigging panels (visible under wood effect) with 'Mr. Colour' Stainless Steel (213) or similar.

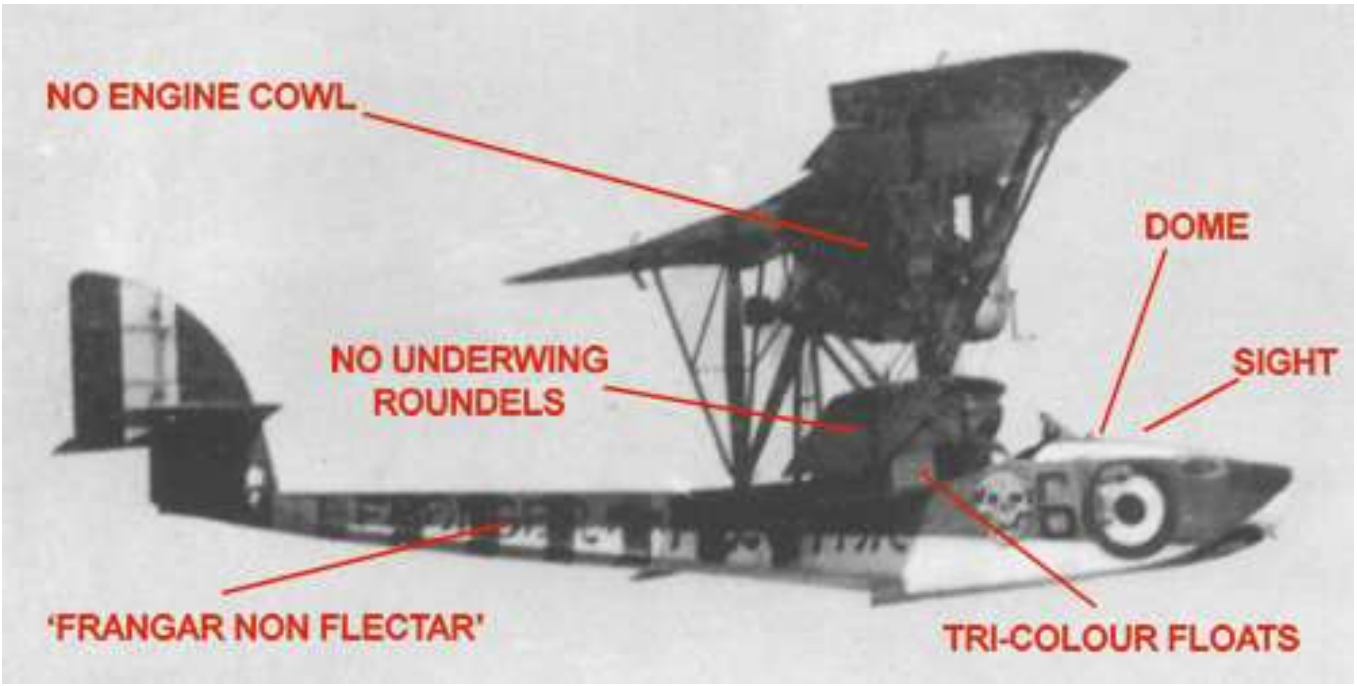
Locate each barrel into the pre-drilled holes in the rear of its gun port and trim the length to that shown in the above photograph.

Secure the barrels into their gun ports using CA adhesive.

FRANGAR NON FLECTAR' legend:

As can be seen on the following photograph, this actual aircraft carried the Latin legend *'FRANGAR NON FLECTAR'* along both sides of the fuselage. This legend is not supplied as a decal in the kit and therefore, if it is to be added, a mask should be made, as hand painting this legend is not really practicable.

NOTE: *I created the mask set on a 'Cricut Air 2' cutting machine, which is able to cut images in various materials (I used masking sheets) from an image created in 'Paint Shop Pro' software (or similar). The image is then imported into the 'Cricut' software and the image cut. If you don't have access to cutter of this type (there are others) and you feel your hand painting is not good enough, it would be best not to have the legend on the model.*
As the legend would have been hand painted, there is no known font I could use to create the mask. Therefore I chose the most similar font available (Mistral) and created the legend in Paint Shop Pro 2019.



Carefully position the masks onto the fuselage.

Airbrush light coats of ‘Tamiya’ Rubber Black (XF85) over the masks to create the legends.

Carefully remove the masks.

Airbrush a light sealing coat over the legends with a semi-matte sealer (e.g. ’Alclad’ Light Sheen ALC-311, ‘Tamiya’ semi gloss X35 or similar).

Weathering:

If desired, the fuselage paint work and decals can be weathered to add grime, slime and wear effects.

Mask off the two window ‘ports’ and the clear windscreen ‘windows (front and rear sides).

If the previously applied nail lines on the fuselage wood panelling has been filled with paints or sealing coats, carefully reapply the nail lines using the ’Rosie the Riveter’ 1:32 scale (1.0 mm).

If desired, very **lightly** sand the leading edges of the markings, particularly around the leading edges of the roundels and fuselage stripes. This will represent water wear.

Refer to Part 3 (Weathering) of this build log and, if desired, apply ‘Flory Models’ Dark Dirt clay wash, which will add a slight grubby appearance and show fine detail, such as the fuselage nail lines.

Once dry, remove the wash leaving your desired ‘weathered’ effect and seal the surfaces to protect the clay weathering.

Refer to Part 3 (Weathering) of this build log and, if desired, apply ‘Flory Models’ White clay wash, which will add a slightly ‘salty’ effect to the fuselage.

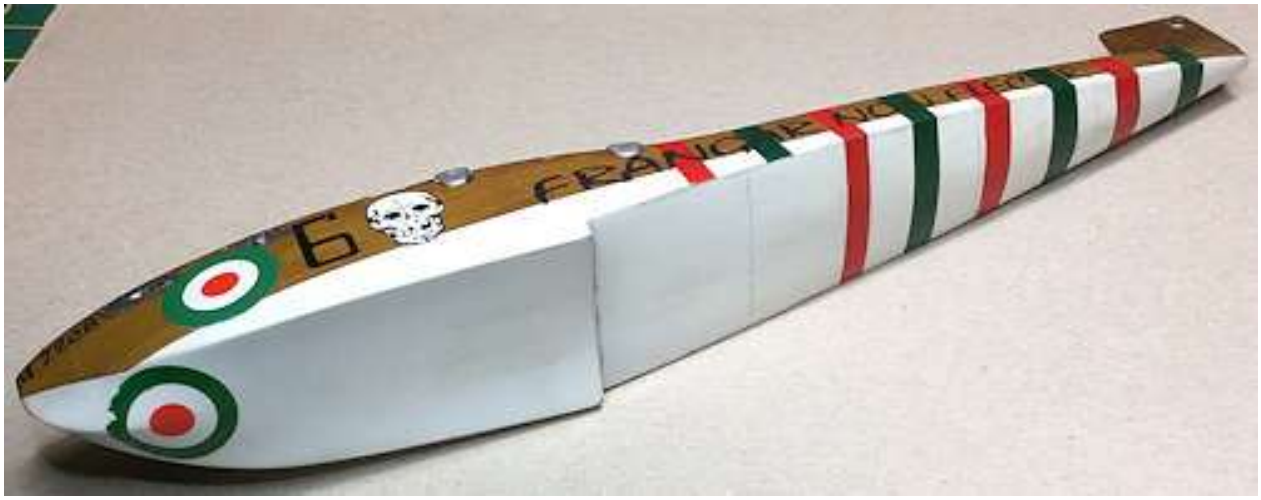
Once dry, remove the wash leaving your desired ‘weathered’ effect and seal the surface to protect the clay weathering.

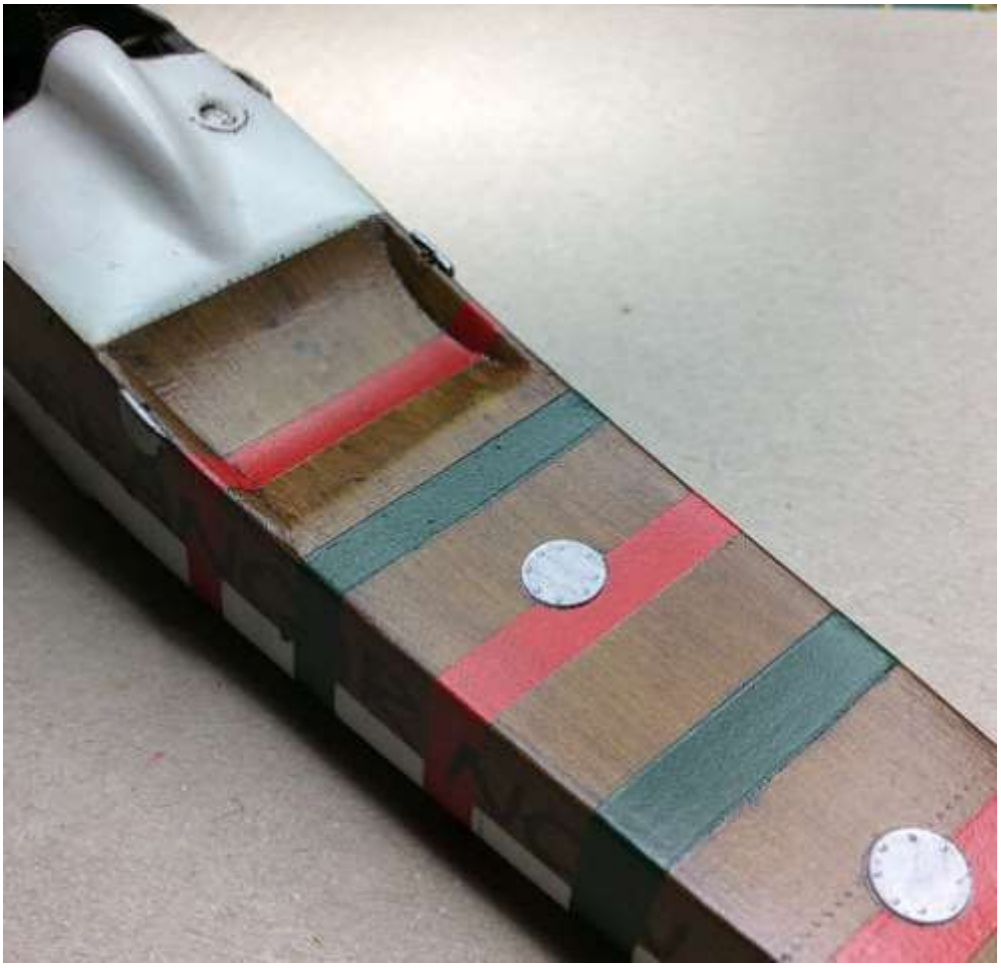
Final surface finish:

Make sure two window ‘ports’ and the clear windscreen ‘windows (front and rear sides) are masked.

Airbrush a light sealing coat over the entire fuselage (e.g. ’Alclad’ Light Sheen ALC –311, ’Tamiya’ Semi Gloss (X35) or similar).

Remove the masking from the two window ‘ports’ and the windscreen.





Wings:

NOTE: Before the wings are fitted to the model, the red, white and green 'tricolours' need to be applied, in addition to wing internal structure and shadowing. This also applies to the ailerons, tail plane and elevators.

Clear Doped Linen:

The colour of the Macchi M.5 wing upper surfaces was not standard, as some had a Clear Doped Linen (CDL) finish whilst others had green doped linen covering. The aircraft being modelled had a CDL finish applied to the upper surfaces of the wings. The Clear Doped Linen (CDL) covering for the upper surfaces of the wings of the Macchi M.5 was of a much lighter 'bleached' colour, almost a white colour and will be created using the 'Aviattic' CDL Bleached (ATT32044) decals. The underside CDL covering allowed a 'ghost' outline of the wing internal structure to show through, as light would have been able to penetrated through the CDL doped linen on the upper surfaces of the wings. The same applies to the tail plane and elevators, as they to were also covered in CDL. Additionally the Italian roundels on the upper surface of the top wing would have also 'ghosted' through the undersides.

The upper surface CDL of the wings would not have had light penetration from below and therefore very little, if any, of the wing internal structure would have been visible. The same applies to the surfaces doped with the red or green colours.

Roundels:

As can be seen on the following photographs, the 'white' inner circles on the upper wing roundels appear lighter than those on the fuselage. Also the shade appears to match the surrounding CDL wing covering. The assumption is that as the CDL covering was bleached and nearly white in colour, the roundel white inner rings were not actually painted, but left a CDL. Only the green and red colours were painted. For this reason the kit supplied decals will not be used but replaced with paint, using masks.

Underside red and green:

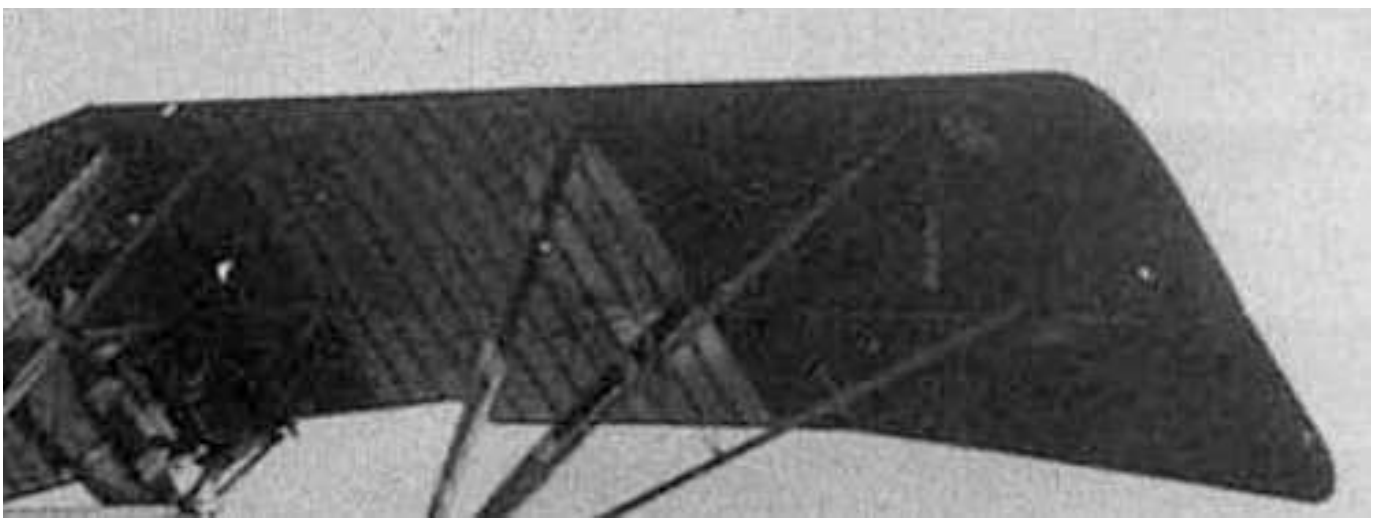
The undersides of both wings, outboard from the wing 'V' strut attachment locations, were painted with the Italian red and green colours. The central 'white' underside surfaces were not painted white, but were in fact left as the CDL finish.

Rib tapes:

The rib tapes on the wings were made of linen and were either stitched or doped in position to cover the stitching that held the linen wing covering onto the individual wing ribs. The rib tapes appear darker in colour than the surrounding CDL wing covering and were quite prominent. It is unlikely the rib tapes were painted with a coloured dope and more likely that as they were CDL strips of linen they effectively doubled the linen thickness over the wing ribs, causing a darker appearance.

NOTE: *The following photographs and illustration show typical CDL wing covering, wing rib tapes, roundels and the underside Green and red colours.*

Example of upper roundel ‘see through’



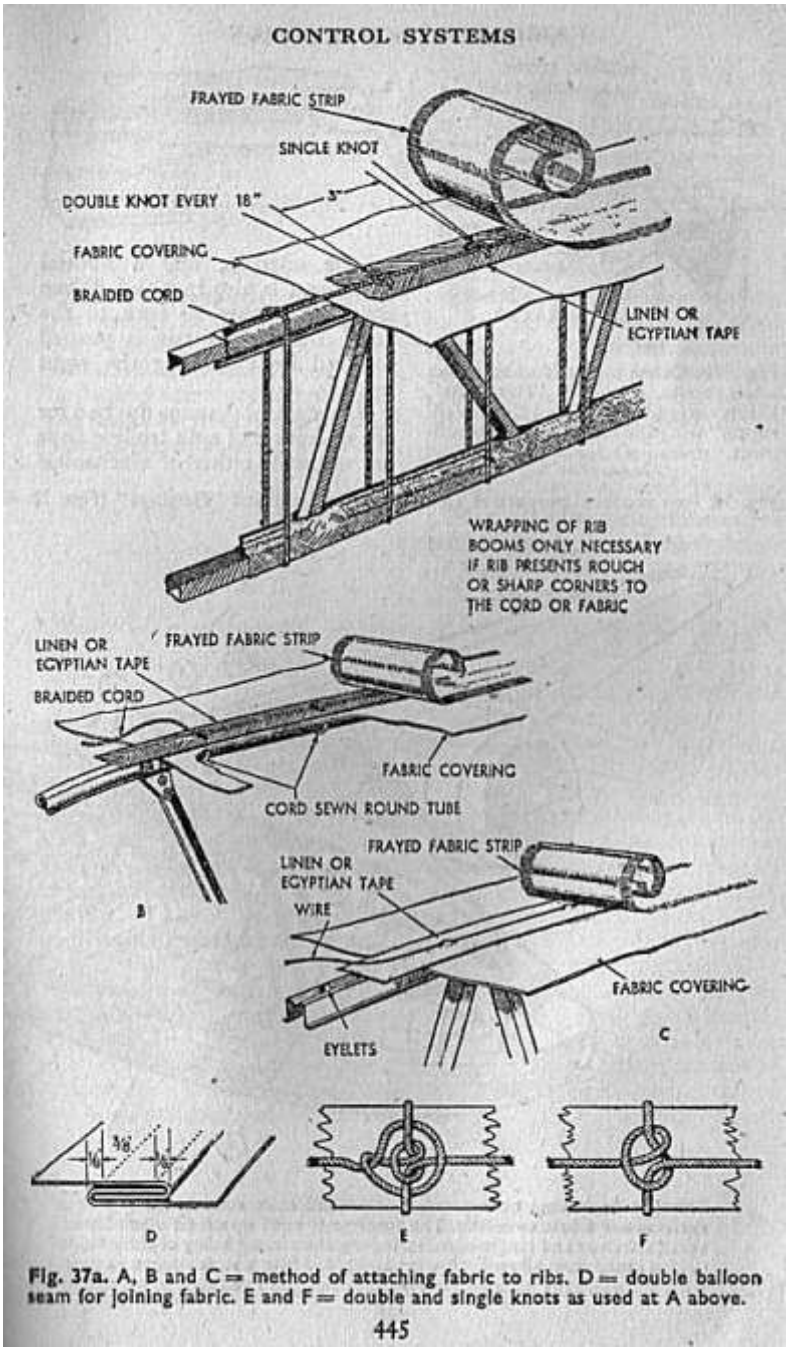


Fig. 37a. A, B and C = method of attaching fabric to ribs. D = double balloon seam for joining fabric. E and F = double and single knots as used at A above.

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General:

Make sure the kit parts 1 - 4, 6 and 7 are free of surface contaminants, such as resin mould release agent, grease from handling etc. If in doubt, wash the parts in warm water and washing up liquid then dry completely.

If necessary fill any imperfections using a modelling putty and sand the surfaces to create a smooth surface.

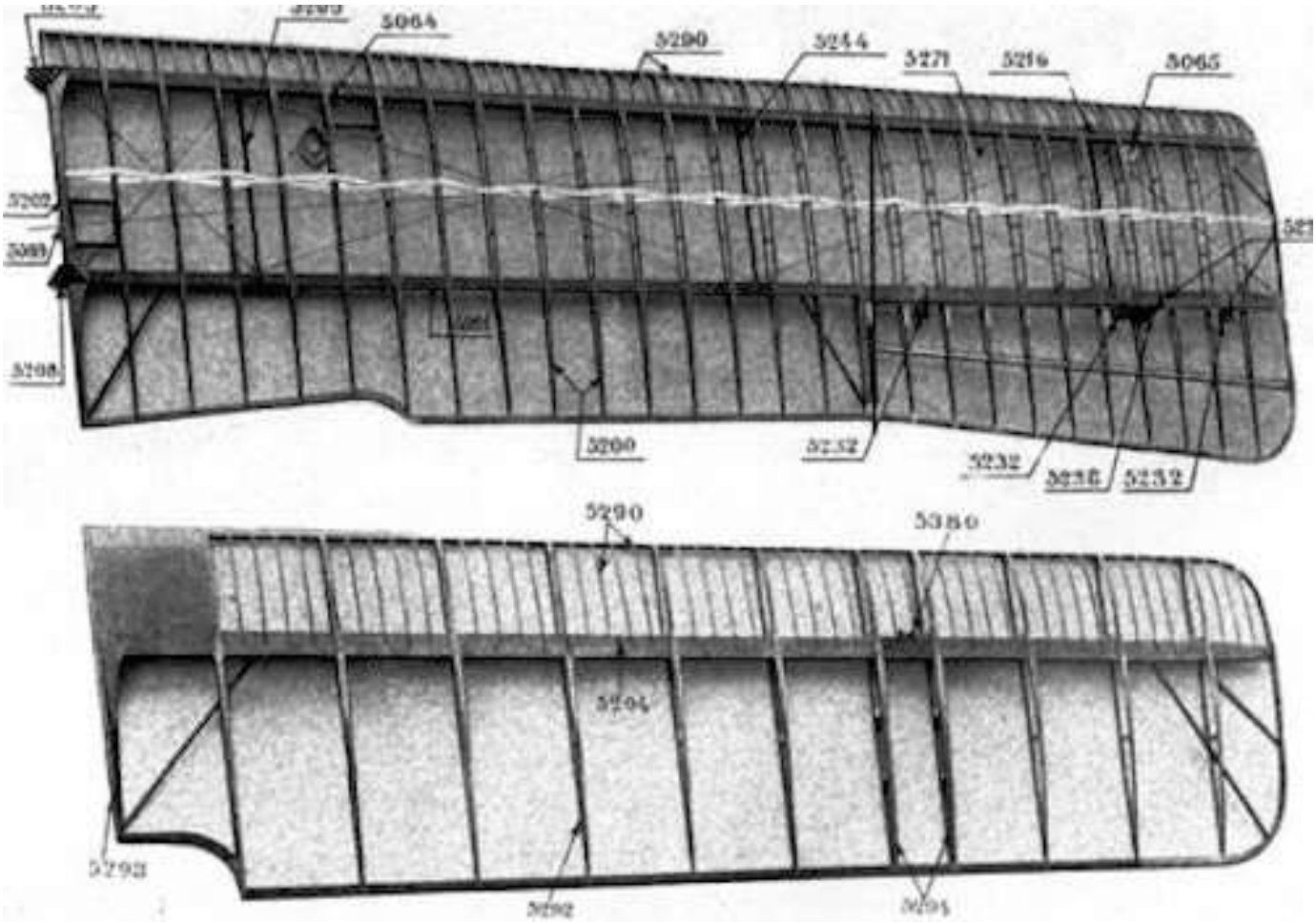
NOTE: *White primer should be applied to the undersides of the wings also, as this will give a good base colour for the decals applied later.*

Airbrush prime the parts using a white primer (e.g. 'AK interactive' White AK-759 or similar).

If necessary, lightly sand the surfaces to create a smooth surface.

NOTE: *The internal structure of the upper and lower wings and upper wing ailerons is shown in the following illustrations. The method of wing construction followed the French Nieuport aircraft designs. As can be seen, the structures consist of wing ribs, front and rear wing spars, bracing struts and cross bracing wires. The lower wing leading edge spars had a much wider chord than that of the upper wing, but unlike the upper wing, had no rear spar. The upper wing halves were joined at the centre line, whereas the lower wings were attached to the fuselage structure.*

Upper and lower wings - internal wing structures



Top wing - upper surfaces:

NOTE: *Refer to the photograph on page 184 for structural information.*

Mask off the wing front and rear spars.

Airbrush the wing spars using a thinned ‘Tamiya’ Smoke (XF19).

Remove the masking.

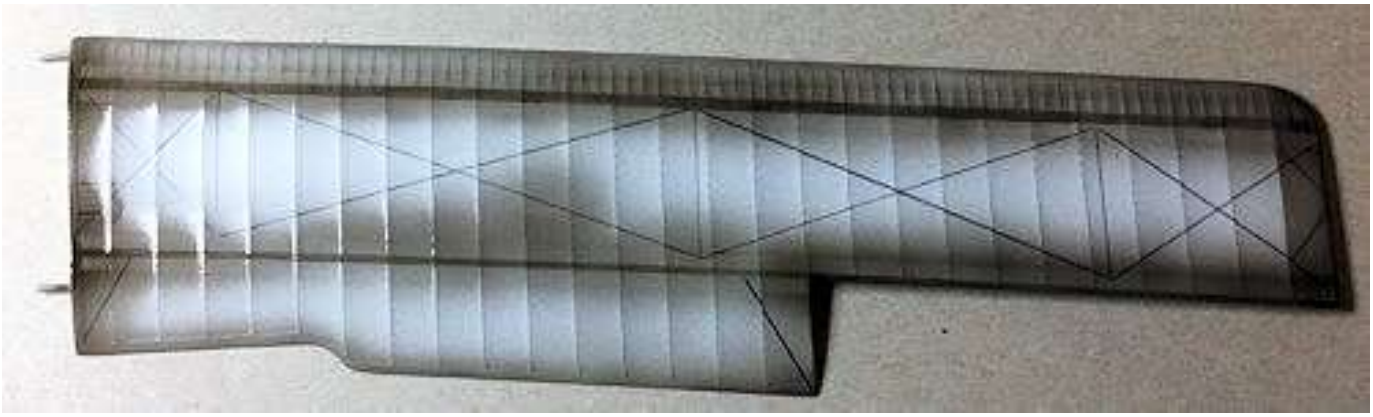
Using a pencil, draw on the cross bracing wires.

Using a pencil, draw on the four diagonal bracing struts.

Using a pencil, draw on the box at the top wing root.

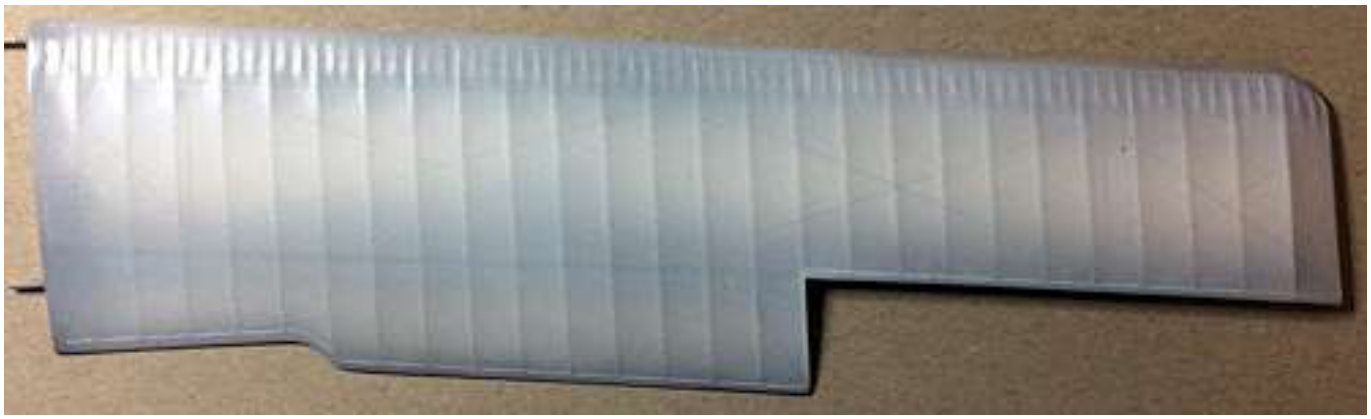
Airbrush wing shading using a thinned ‘Tamiya’ Smoke (XF19).

Examples of the top side of an upper wing.



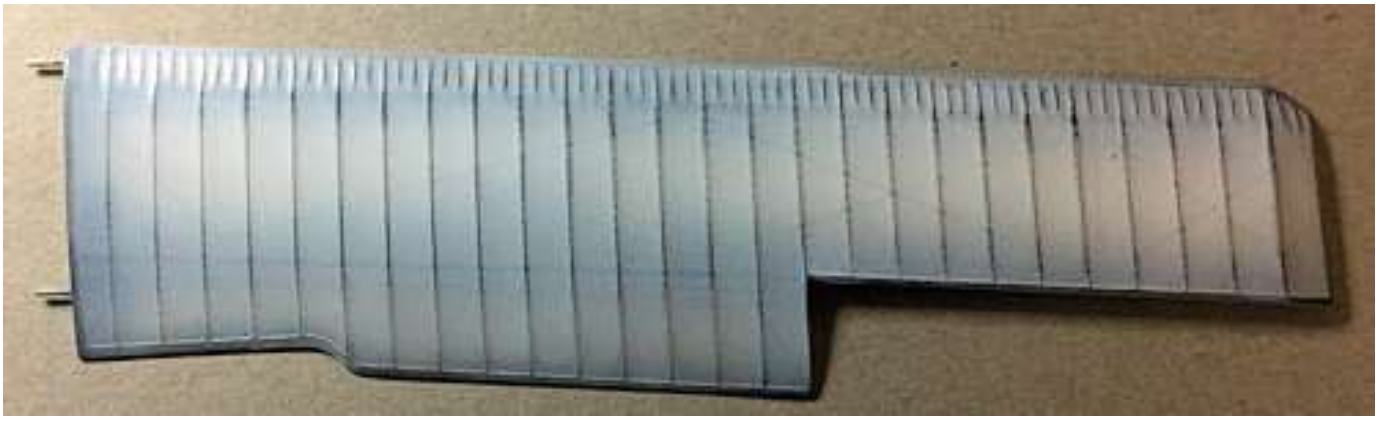
NOTE: *The following step is required to ‘knock back’ (lessen) the applied lines and the painted spars and shading. Otherwise they will show too strong through the CDL decals when applied.*

Airbrush a misting coat over the wings, using a white primer (e.g. ’AK interactive’ White AK759 or similar). The end result should be that the applied spars, lines and shading should be just visible through the white top coat.



Lightly sand or polish the surfaces to create a smooth surface and to highlight the raised wing detail, such as the wing ribs. Make sure you ‘flat sand’ over the raised detail so as to avoid sanding away the white surface between the raised details.

Airbrush a light coat of gloss sealer over the surfaces, using a Gloss sealer (e.g. ’Alclad’ Aqua Gloss 600, ‘Tamiya’ Gloss X22 or similar).



‘Aviattic’ CDL decal application:

NOTE 1: *The ‘Aviattic’ linen decals are unlike normal screen printed decals, in that when being applied, have the ability to be handled with slightly less care than normal and they have the ability to stretch slightly, which standard decals do not. That said, if you handle them too roughly, damage can occur.*

NOTE 2: *Make sure the model surface for each decal to be applied is clean and smooth or particles on the surface may cause ‘silvering’ (trapped air) under the decals when dry.*

NOTE 3: *The ‘Aviattic’ CDL decals being used are not ‘cookie’ cut to the shapes required. Therefore the decals must be hand cut to shape.*

Lay the wing **underside surface** down onto the **decal** side of the ‘Aviattic’ CDL Bleached (ATT32044) decal sheet.

NOTE: *During the following step, do not press too hard when tracing the outline as this may tear the decal.*

Using a pencil, lightly trace the outline of the wing onto the decal, leaving sufficient to wrap over the outer edges.

NOTE: *To aid in adhesion, you can mix a small amount of PVA (white glue) into the decal water.*

Wet the model surface with clean water.

Soak the decal in warm water with a small amount of PVA adhesive (white glue) for around 30 seconds or long enough to be able to move the decal on its backing sheet.

Carefully lift the decal on its backing sheet from the water. Make sure the decal does not fold over on itself, as it will be difficult to separate a fold once out of the water.

Carefully slide the decal off one end of the backing paper and position the decal end onto the wing and holding that end, slide out the backing paper.

Using large, flat brush or cotton buds, start to smooth out the decal at one end, removing any water from underneath and smoothing the decal onto the surface. Continue this along the length of the decal, taking care not to grip the decal surfaces with your fingers, as this will cause ripples in the decal.

Once the decal is smoothed down onto the model surface, apply pressure along the decal with soft and dry tissue paper or by finger pressure whilst wearing lint free cotton gloves. This will expel any remaining water and press the decal on to the model surface. Check over the decal to make sure there are no tears or folds, which need to be rectified before the decal sets.

Use a needle to carefully prick through the decal on any areas where air is trapped and can't easily be removed, such as wing strut location holes and pre-drilled rigging holes.

NOTE: *A hair dryer, set to medium heat, can be used to help the decal conform onto the surface. Obviously, don't have the heat setting to high or overheat the model part or you may damage both the decal and the part.*

Check for any decal round the wing edges and if necessary, gently sand away the unwanted decal.

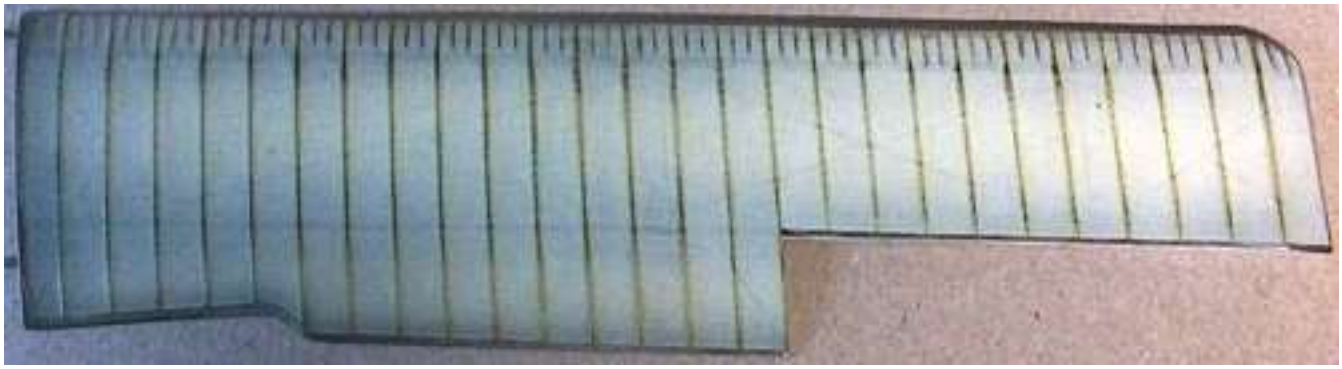
If necessary, apply 'Microscale' MicroSol around any lifted edges of the decals. 'Tamiya' X20A or 'Mr. Colour' Self Levelling thinners can also be used sparingly to 'seat down' areas of the decal that have lifted of the part or show evidence of 'silvering' (trapped air under the decal).

Allow these decals to fully set.

NOTE: *Even when applied and sealed, the decals can easily be damaged if handled roughly or accidently contacted by a sharp edge. Once decals have been applied, I use lint free cotton gloves when handling those surfaces.*

Cut 2.0 mm wide strips of the CDL decal, long enough to cover the chord of the wing (leading to trailing edge).

Apply each strip over the wing rib tapes as done for the previously applied wing CDL decal.

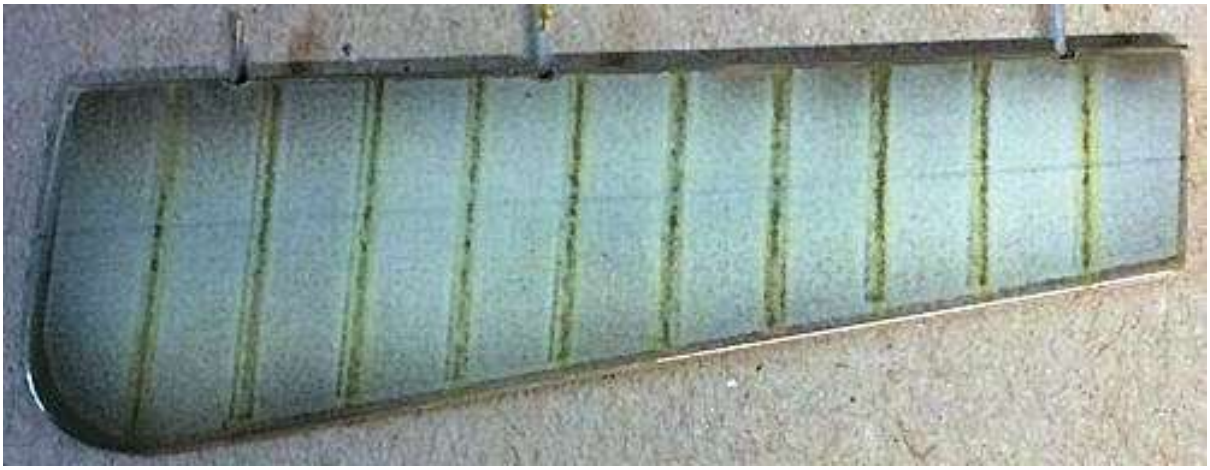


To protect the applied decals, airbrush a light coat of semi-matte sealer (e.g. Alclad' Light Sheen (ALC-311), 'Tamiya' Semi-Gloss (X35) or similar).

Top of ailerons:

NOTE: *Refer to the photograph on page 184 for structural information.*

The process for the applying the CDL surface finish is the same as for the upper wing, but with the aileron internal structure instead.



Upper wing - top roundels:

NOTE 1: *The assumption is that as the CDL covering was bleached and nearly white in colour, the roundel white inner rings were not actually painted, but left a CDL. Only the green and the red colours were painted. Masking and painting just the outer green and inner red for the roundels is and option, leaving the CDL decal exposed. However, the kit supplied decals will used, even though the inner ring is too white, as to apply masks over the existing decals will probably pull up the decals when removed. Also as the kit decals are 'translucent, they will allow a degree of 'show through' from the details underneath.*

NOTE 2: *Refer to the kit instruction illustration for positioning information. The upper wing roundels should be positioned with their centre line aligned over the third inboard wing rib tape from the edge of the aileron cut-out and the outer edge on the sixth inboard wing rib tape.*

Carefully apply the two upper wing roundels onto the existing CDL decal covered wing surface.

NOTE: *To create the masks for the roundels, I used a circle cutter ('ThinnerLine' circle cutter - see page 73).*

Secure an engineers set square to the working surface as this will provide a 90 degree locator for the circular cutter and provide concentric circle cutting.

Using the kit supplied decals (for the upper wing) as size guides, cut from the CDL sheet a circle with a hole in the centre, to replicate the white inner ring of the kit roundels.

Apply the CDL decal over the white inner ring of the kit roundels.

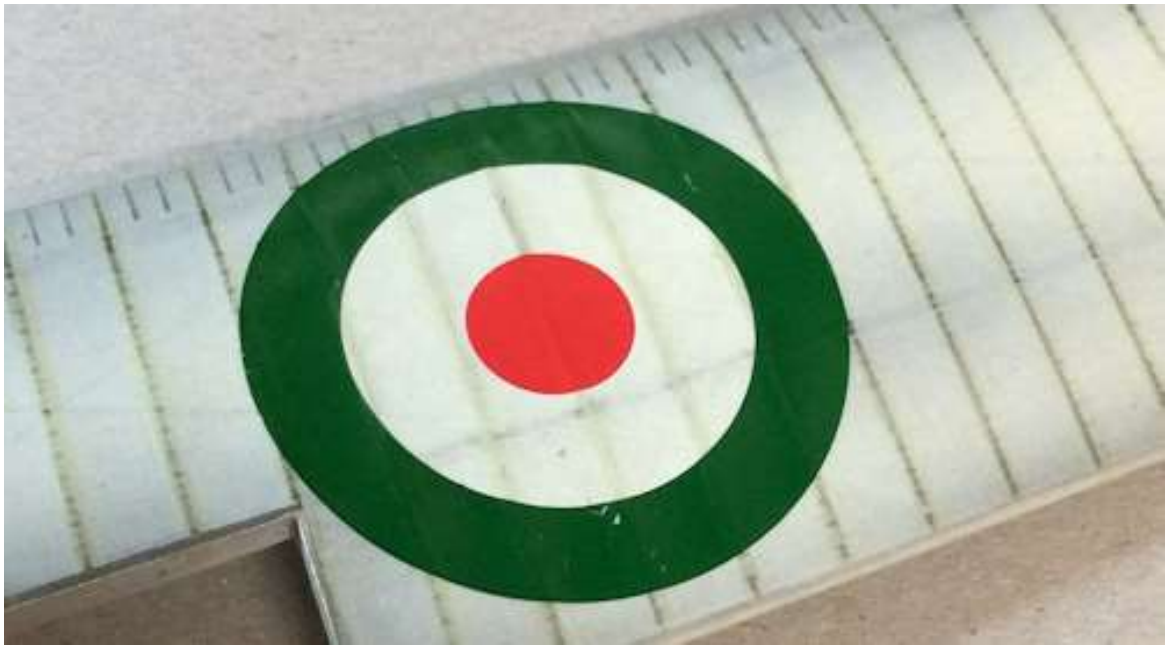
Cut 2 mm strips from the CDL decal sheet and apply them as rib tapes onto the CDL ring only (not over the red or green of the roundel decals).

Airbrush a light coat of gloss sealer over the decals, using a Gloss sealer (e.g. 'Alclad' Aqua Gloss 600, 'Tamiya' Gloss X22 or similar).

Mask off the wing rear spar (follow the pre-shaded outline).

Very lightly dust 'Humbrol' Smoke pigment between the masking to represent the rear spar.

Seal the upper wing surface with a light coat of semi-matte sealer (e.g. Alclad' Light Sheen (ALC-311), 'Tamiya' Semi-Gloss (X35) or similar).



Upper wing - underside:

NOTE 1: *The order to apply the underside finish is:*

Prime white - Paint 'ghost' roundels - Gloss coat - Paint outer red and green areas - Apply pre-shading - Gloss coat - Apply CDL wing covering decals and rib tapes - Sealing coat.

NOTE 2: *The underside of the top wing also has the 'ghost' roundels and the Italian red and green outer colouring. The position of the 'ghost' roundels should be aligned with the position of the roundels on the top of the wing.*

To represent the 'ghost' roundels:
Mask need to be created for the faded 'see through' roundels on the underside of the upper wing.

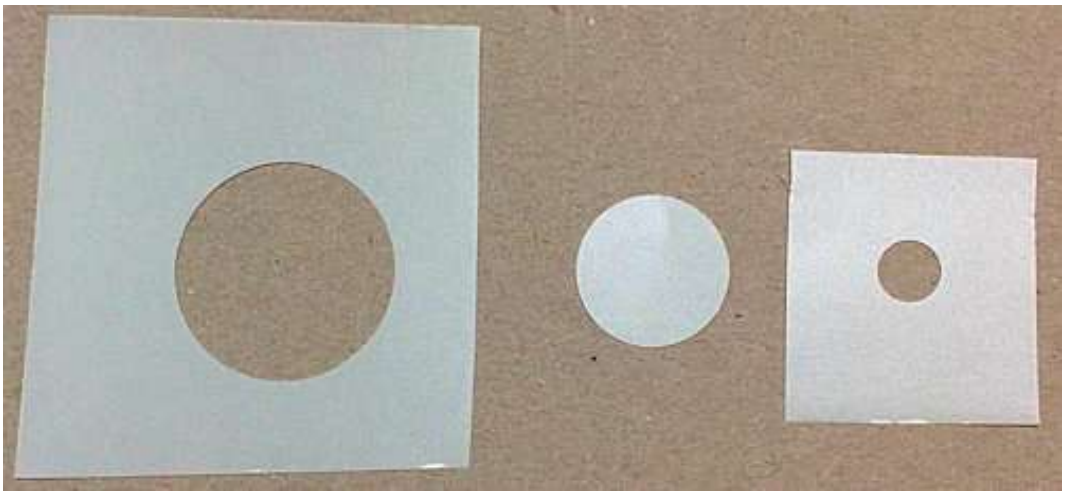
NOTE: *To create the masks for the roundels, I used a circle cutter ('ThinnerLine' circle cutter - see page 73).*

Using the kit supplied decals (for the upper wing) as size guides, cut the three elements of the roundels from 'Artool' Ultra Mask sheets.

Two large square masks (1) with circle cut-out for the overall diameter of the roundel.

Two discs (2) the diameter of the inner white ring with the red disc.

Two large squares (3) with circle cut-out the diameter of the roundel centre red disc.



Apply masks (1) centrally onto the underside of the wing with their centre line aligned over the third inboard wing rib tape from the edge of the aileron cut-out and the outer edge on the sixth inboard wing rib tape.

Apply mask (2) centrally inside the mask (1).

NOTE: *The following step is required to mask off the wing areas that will be painted red and green, effectively covering that part of the 'ghost' roundels.*

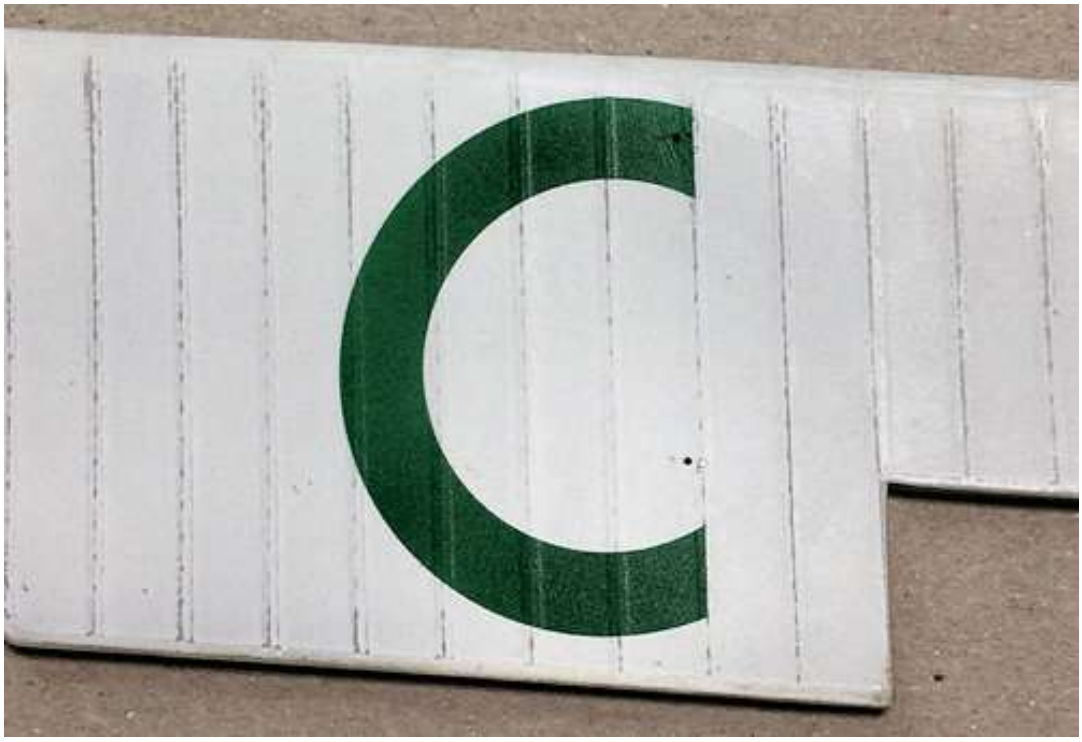
Mask off the chord (leading edge to trailing edge) of the wing underside along the wing rib tape just outboard from the two locations for the wing 'V' support strut (second rib tape inboard from the edge of the aileron cut-out.

Mask off the remaining exposed areas of the underside of the wing.

NOTE: *In the following steps the paint should be applied as a light coat, as when finished it should represent the 'ghost' of the upper roundels showing through the CDL wing covering.*

Airbrush between the two masks a light coat of 'Tamiya' Green (X5) mixed with approximately 15% of 'Tamiya' Grey Green (XF76).

Remove all masking.



NOTE: *In the following step, avoid pressing the mask onto the freshly painted green ring. Applying too much pressure to the mask on the painted ring may cause the paint to tear away when the mask is removed.*

Apply mask (3) so the cut-out disc is centrally positioned within the partly painted green ring.

As before, mask off the chord (leading edge to trailing edge) of the wing underside along the straight edge of the partly painted green ring.

Mask off the remaining exposed areas of the underside of the wing.

Airbrush a light coat of 'Tamiya' Red (X7) over the disc cut-out.

Remove all masking.

Protect the painted roundels by airbrushing a light coat of gloss sealer over the painted roundels, using a Gloss sealer (e.g. 'Alclad' Aqua Gloss 600, 'Tamiya' Gloss X22 or similar).

'Knocking back':

NOTE: *The following step is required to 'knock back' (lessen) the applied lines and the painted spars, shading and part roundels. Otherwise they will show too strong through the CDL decals when applied.*

Airbrush a misting coat over the wing, using a white primer (e.g. 'AK interactive' White AK759 or similar). The end result should be that the applied spars, lines, shading and part roundels should be just visible through the white top coat.

Lightly sand or polish the wing to create a smooth surface and to highlight the raised wing detail, such as the wing ribs. Make sure you 'flat sand' over the raised detail so as to avoid sanding away the white surface between the raised details.

Airbrush a light coat of gloss sealer over the surfaces, using a Gloss sealer (e.g. 'Alclad' Aqua Gloss 600, 'Tamiya' Gloss X22 or similar).

Underside 'tricolours':

The undersides of the upper and lower wings were 'tricoloured' - that is the centre sections were left as CDL, the left side (from the wing support 'V' strut locations) was red and the right side was green, including the underside of the ailerons. The red and green colours cover the outboard half of the 'faded 'see through' roundels.

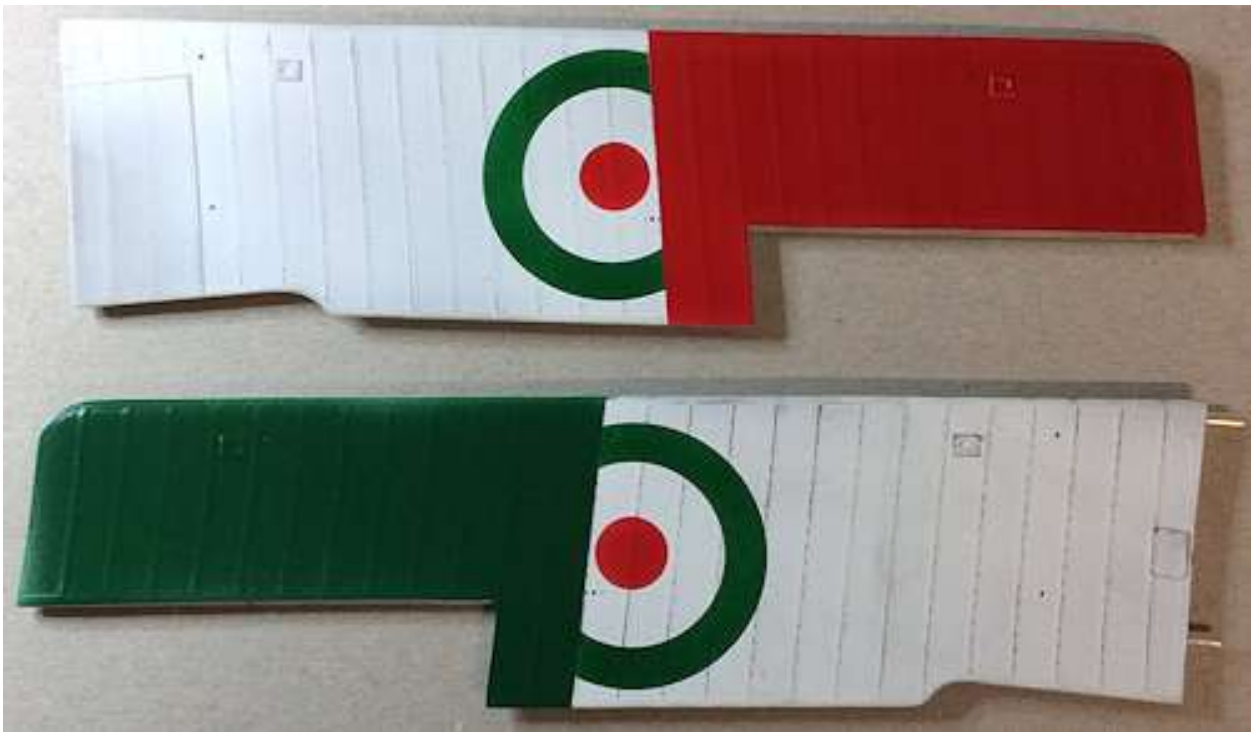
Mask off the centre sections of the wing undersides, including the half 'ghost' roundels.

Airbrush the right wing outer sections, using 'Tamiya' Green (X5} mixed with approximately 15% of 'Tamiya' Grey Green (XF76).

Airbrush the left wing outer sections, using 'Tamiya' Red (X7).

Carefully remove the masking.

Brush paint the around the cut-outs for the ailerons with the appropriate colour, as above.



CDL covering:

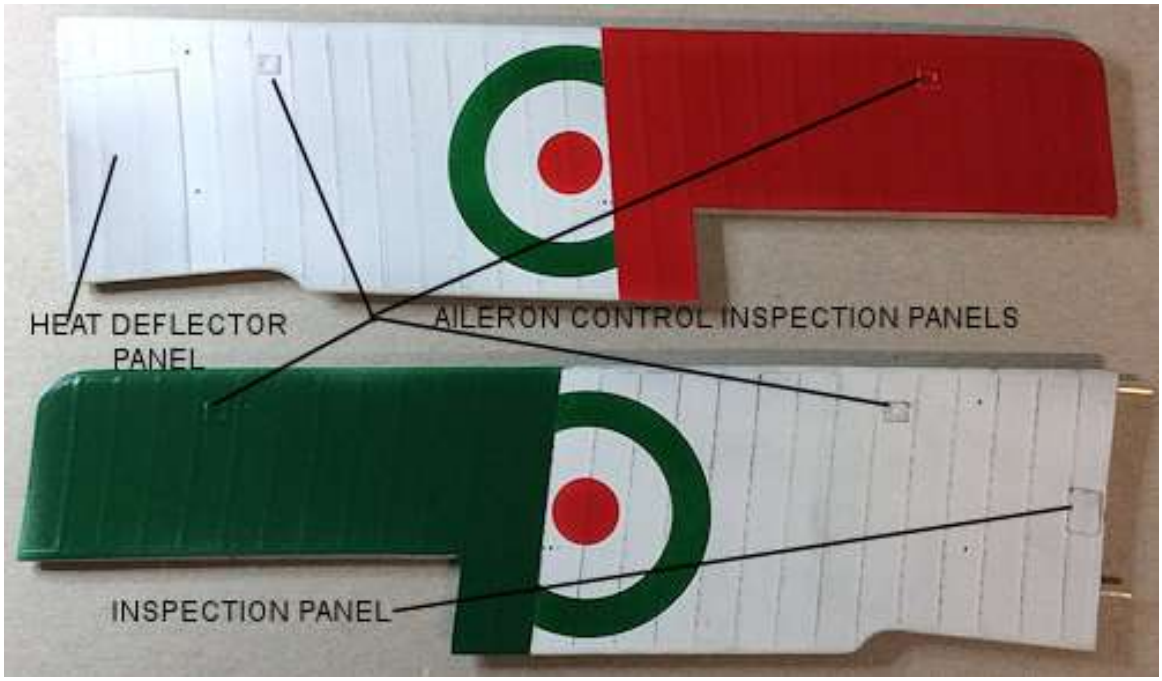
NOTE 1: *Refer to the photograph on page 184 for structural information.*

NOTE 2: *The CDL covering on the underside of the upper wing only needs to cover the unpainted centre section.*

Create the CDL finish on the underside of the upper wing, following the same procedure used for the applying the CDL surface finish to the top surface of the upper wing.

Metal panel and fittings:

At the wing root of the left wing is a metal heat deflection panel, which deflects heat from the engine exhausts pipes. Also inboard from the leading edge on both wing halves are removable inspection panels for the aileron control wires. Finally, at the wing root of the right wing is another inspection panel.



NOTE: *The metal heat deflector plate is moulded with two wing rib tapes. However it is assumed that these would not have been rib tapes as such, but more likely nail or screw lines.*

Using a point tool (e.g. 'Rosie the Riveter'), create screw lines where the rib tapes were and around the outer edge of the panel.

Mask off the wing surface around the six panels.

Airbrush 'Alclad' Black Goss Black Base (ALC-305-60) over the six panels.

Airbrush 'Alclad' Steel (ALC-112) over the six panels.

Remove all masking.

Final finish:
The final weathering finish can now be applied.

Seal the surfaces of the upper wing halves and both ailerons, both elevators and the tail plane, with a light coat of semi-matte sealer (e.g. Alclad' Light Sheen (ALC-311), 'Tamiya' Semi-Gloss (X35) or similar).

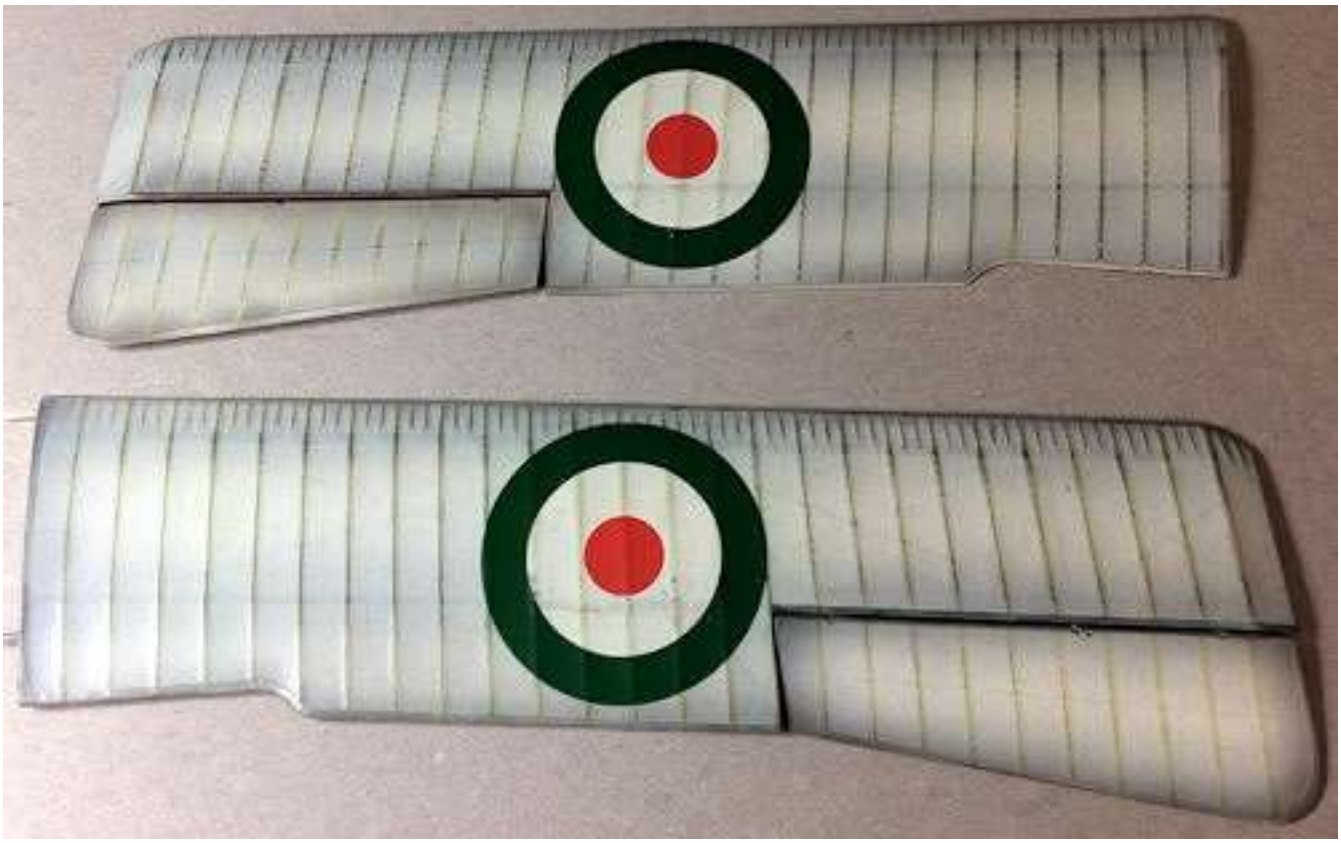
Refer to Part 3 (Weathering) of this build log - Apply 'Flory Models' Dark Dirt fine clay wash over the red and green areas of the wings and the ailerons.

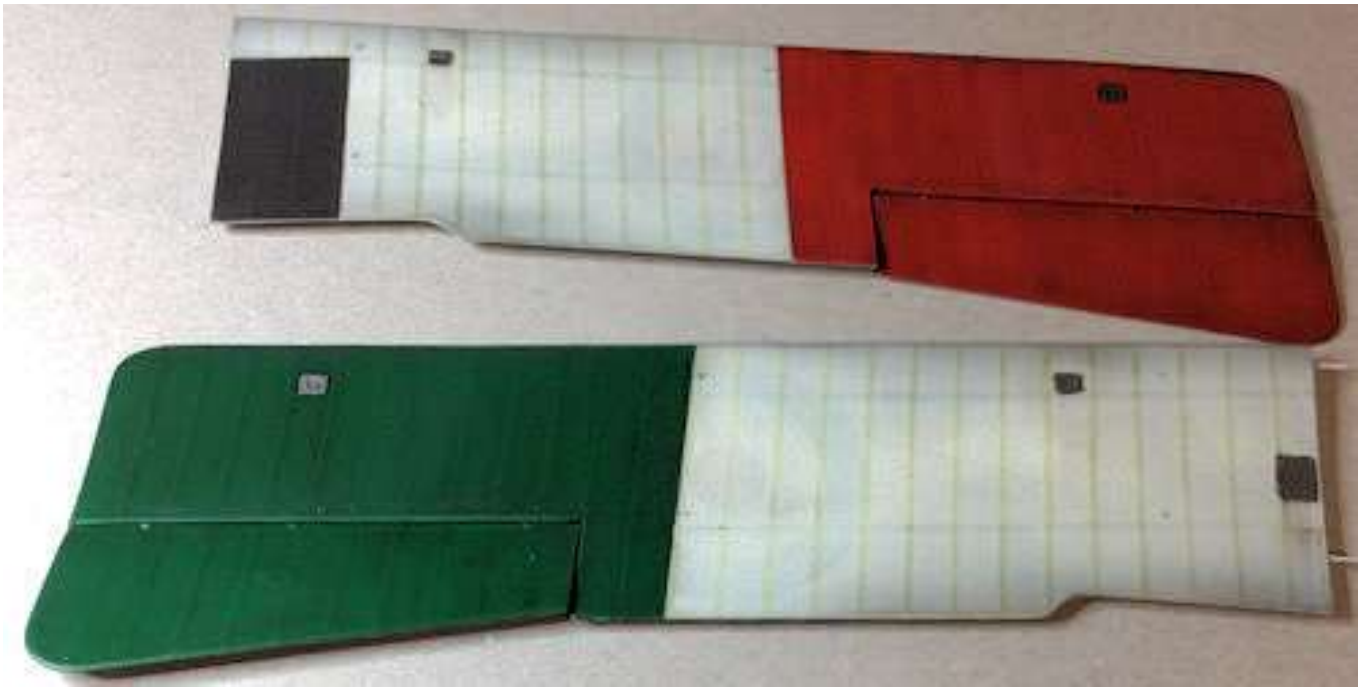
Remove the wash to highlight the wing and aileron rib tapes.

Apply 'Flory Models' Grey along the leading edges of the red and green areas of the wings and the ailerons.

Remove the wash to highlight sea salt erosion on the leading edges.

Seal the weathered areas with a light coat surfaces of semi-matte sealer (e.g. Alclad' Light Sheen (ALC-311), 'Tamiya' Semi-Gloss (X35) or similar).





Lower wings - upper surfaces:

NOTE: *Refer to the photograph on page 184 for structural information.*

The process for the applying the CDL surface finish is the same as for the underside of the upper wing, but with the lower wing internal structure instead.

Lower wing - undersides:

NOTE 1: *The order to apply the underside finish is:*

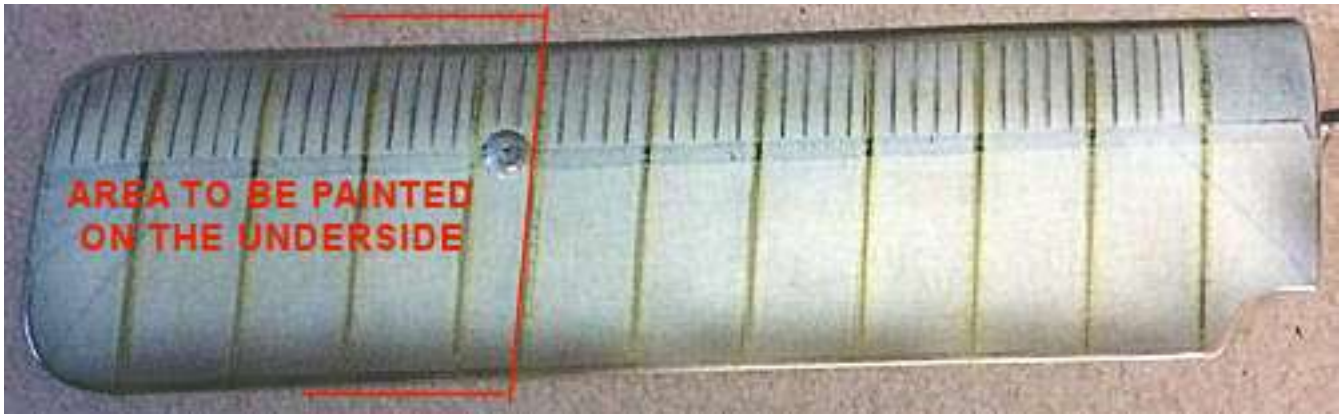
Prime white - Paint outer red and green areas - Gloss coat - Apply pre-shading - Gloss coat - Apply CDL wing covering decals and rib tapes - Sealing coat.

NOTE 1: *Refer to the photograph on page 184 for structural information.*

NOTE 2: *Generally, the Macchi M.5 had Italian roundels located on the top surface of the upper wing as well as on the underside of the lower wings. However this particular Macchi M.5 did not have roundels on the lower wing and therefore these roundels are not being applied.*

Underside 'tricolours':

The red and green coloured outer areas of the underside of the lower wing halves is created following the same procedure as used for the underside of the upper wing. However, the areas to be painted cover the outboard four and a half rib panels (five wing ribs outboard to the wing tip).



CDL covering:

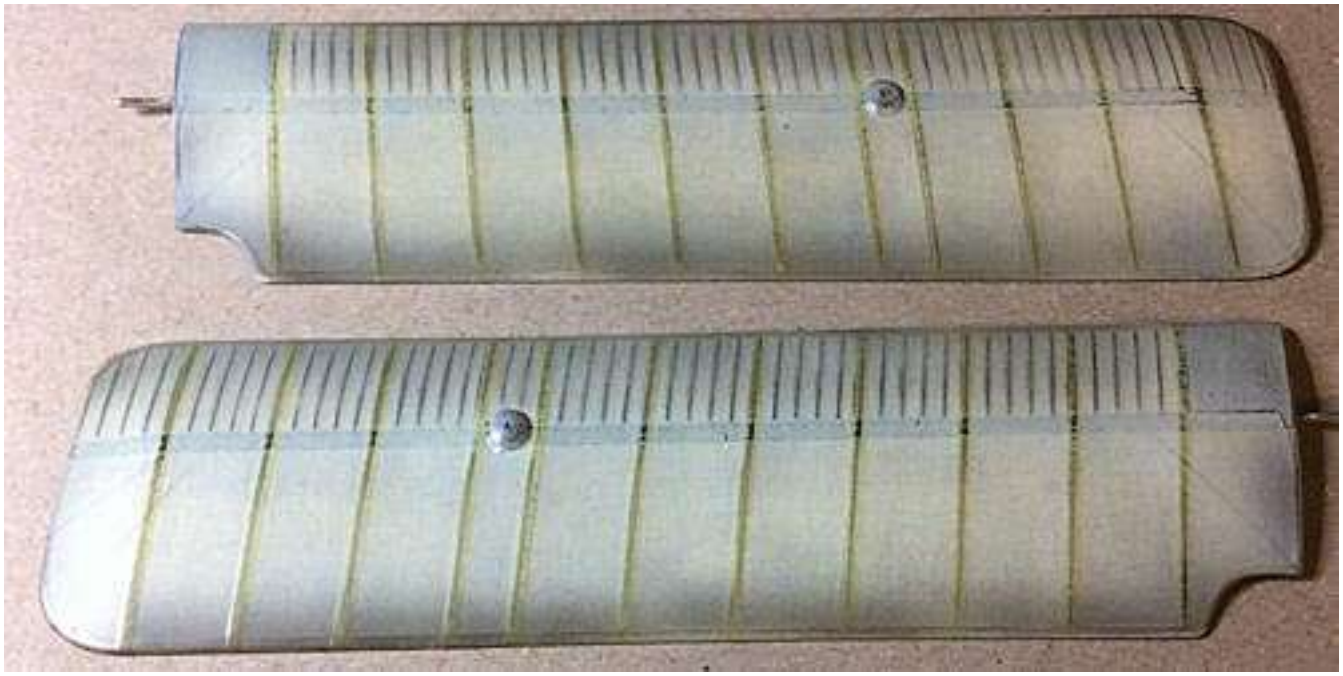
NOTE 1: *Refer to the photograph on page 184 for structural information.*

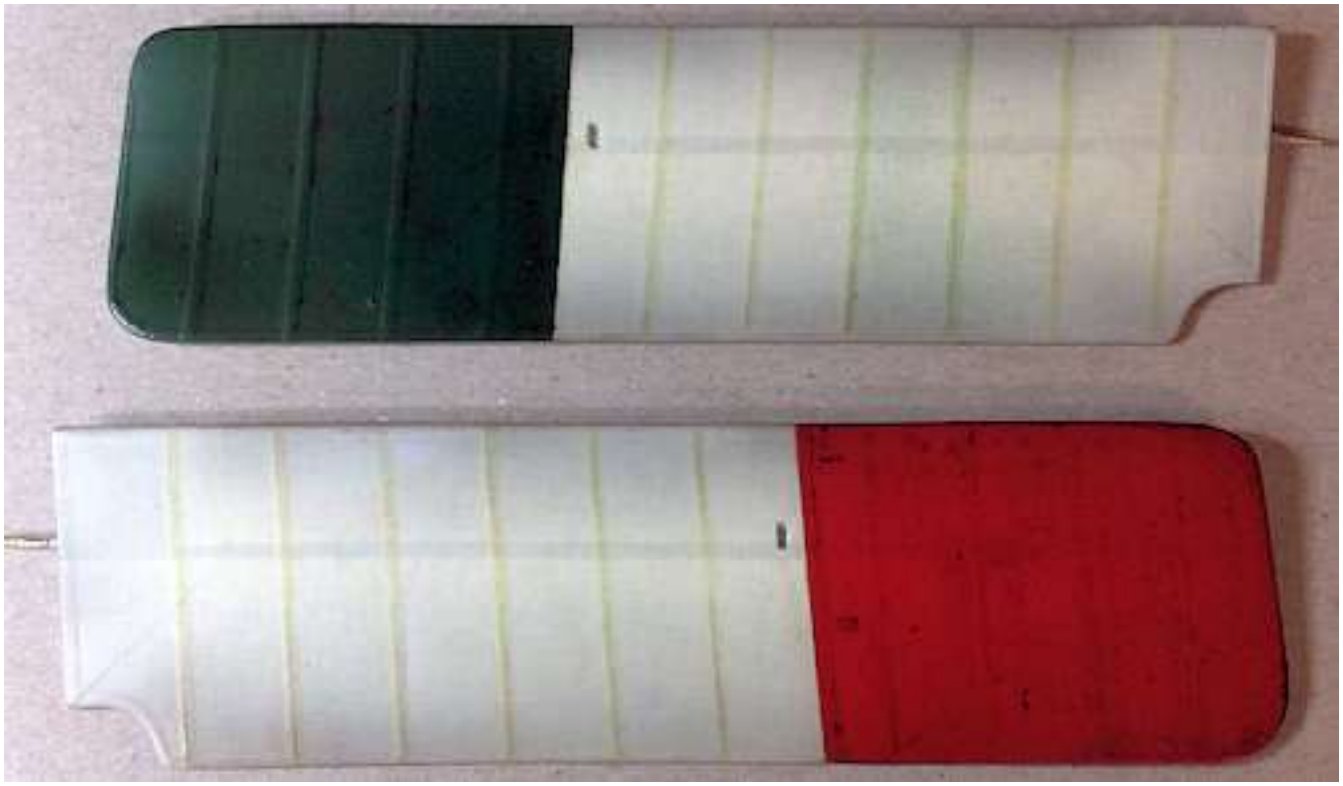
NOTE 2: *The CDL covering on the underside of the lower wing halves only needs to cover the unpainted centre sections.*

Create the CDL finish on the underside of the upper wing, following the same procedure used for the applying the CDL surface finish to the underside of the upper wing.

Final finish:
Apply the final weathering finish following the same procedure as for the upper wing.

Seal the wings with a light coat of semi-matte sealer (e.g. Alclad' Light Sheen (ALC-311), 'Tamiya' Semi-Gloss (X35) or similar).





Tail unit:

Make sure the kit parts 48, 49, 50, 51 and 52 are free of surface contaminants, such as resin mould release agent, grease from handling etc. If in doubt, wash the parts in warm water and washing up liquid then dry completely.

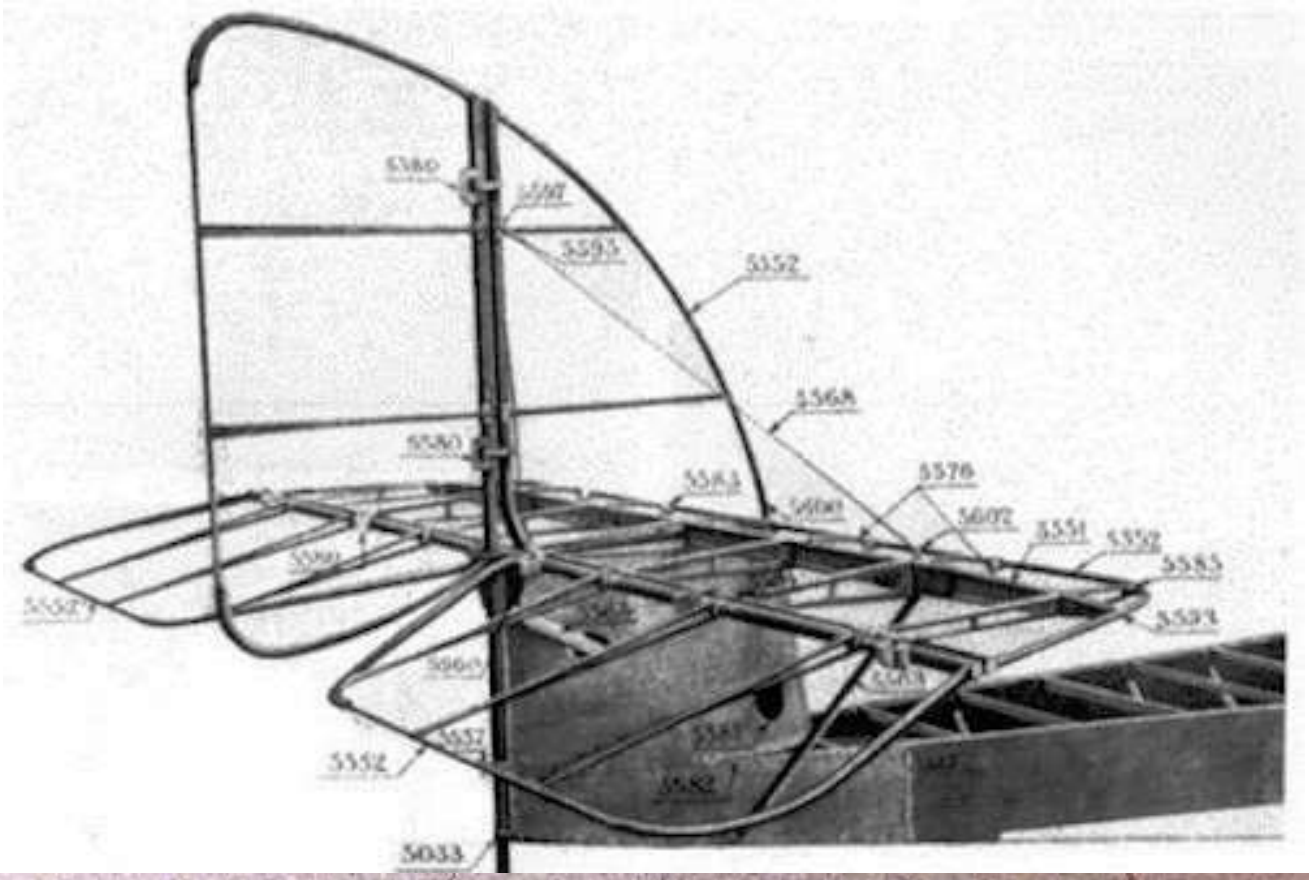
If necessary fill any imperfections using a modelling putty and sand the surfaces to create a smooth surface.

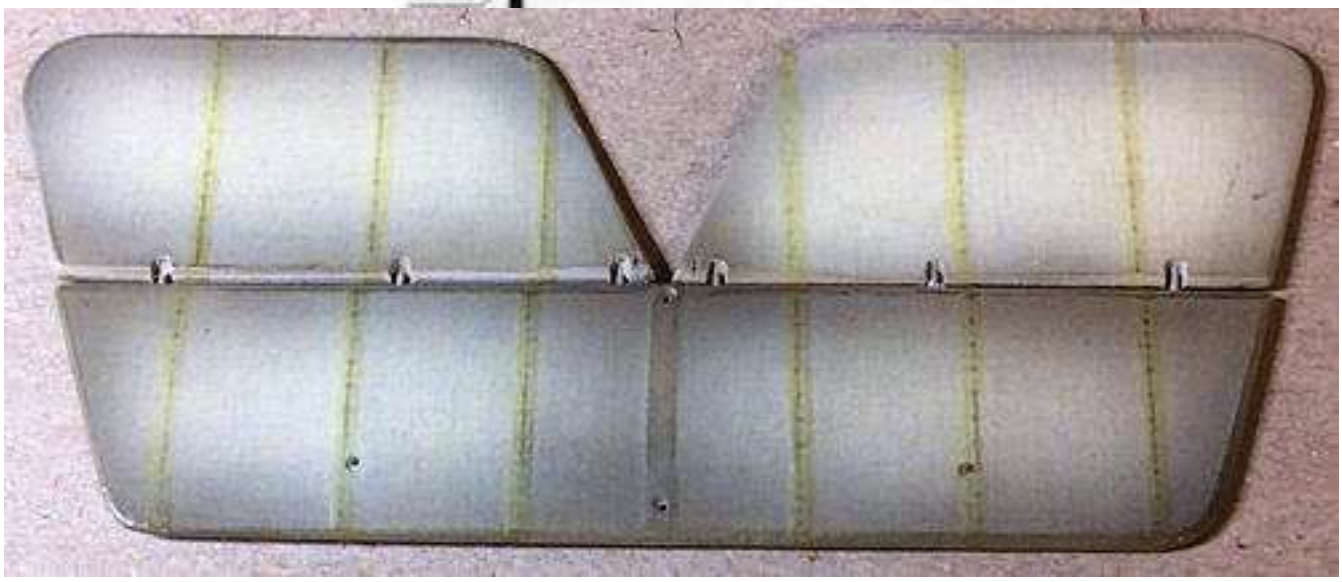
Tail plane and elevators:

NOTE: *Refer to the following photograph for structural information.*

The process for the applying the CDL surface finish is the same as for the wings, but with the tail plane and elevators internal structure instead.

Internal tail unit structure





Fin and rudder:

NOTE 1: *Refer to the previous photograph for structural information.*

NOTE 2: *The kit supplied decals for the fin and rudder will not be used, but be painted instead.*

Airbrush prime the fin and rudder with white primer (e.g. 'AK interactive' White AK759 or similar).

Lightly sand or polish the surfaces to create to highlight the raised detail, such as the ribs. Make sure you 'flat sand' over the raised detail so as to avoid sanding away the painted areas.

Make sure the surface is smooth and free from any imperfections. Lightly sand if necessary.

Refer to the kit colour illustration and mask off the white area on the fin and rudder.

Airbrush the forward area of the fin with 'Tamiya' Green (X5} mixed with approximately 15% of 'Tamiya' Grey Green (XF76).

Airbrush the rear area of the rudder with 'Tamiya' Red (X7).

Remove the masking.

NOTE: *The process for the applying the CDL surface finish is the same as for the wings.*

Airbrush a light coat of gloss sealer over the fin and rudder, using a Gloss sealer (e.g. 'Alclad' Aqua Gloss 600, 'Tamiya' Gloss X22 or similar).

Apply strips of CDL decal to the white areas on both sides of the fin and rudder.

Apply short strips of CDL decal to the horizontal rib tapes on the white areas **only** on both sides of the fin and rudder.

Airbrush a light sealing coat over the fin and rudder (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).

Apply 'Flory Models' Dark Dirt over the red and green areas of the fin and rudder to achieve a weathered effect.

Airbrush a light sealing coat over the fin and rudder (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).

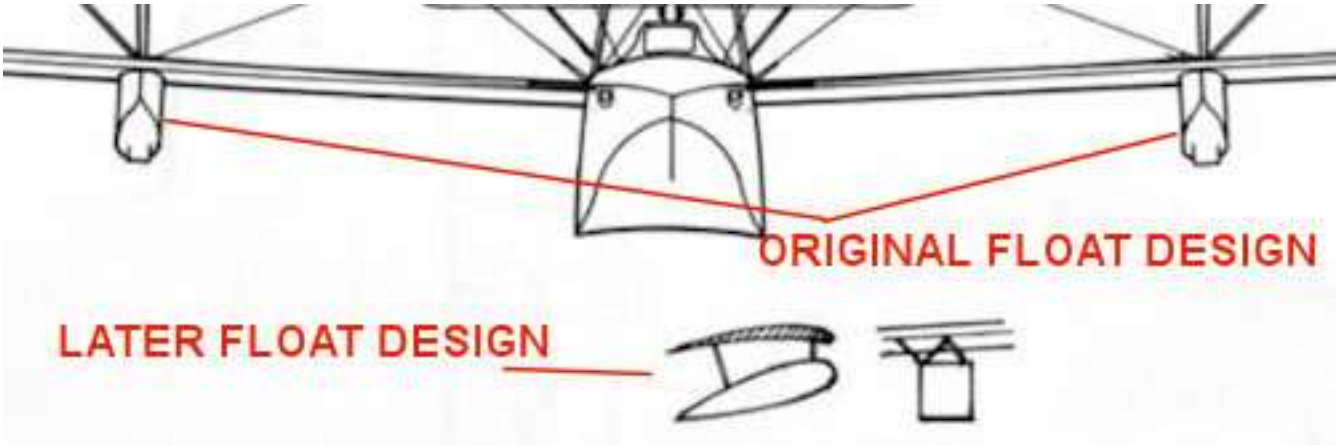
Wing floats:

NOTE: *The two wing floats should already have been constructed with their support struts and primed with white primer.*

On this particular aircraft, the floats were painted with the Italian tricolours and the photograph below appears to show that the colours were green, white the red (front to rear), as for the fin.

The float support struts are assumed to be painted grey, as for the wing support struts.

The following illustration shows the floats and the 3 degree dihedral angle of the lower wing.



If not already done, airbrush prime the floats using a white primer (e.g. 'AK interactive' White AK-759 or similar).

If necessary, lightly sand the surfaces to create a smooth surface.

Mask off each float to leave just the forward green area exposed.

Airbrush the forward area with 'Tamiya' Green (X5} mixed with approximately 15% of 'Tamiya' Grey Green (XF76).

Remove the masking.

Mask off each float to leave just the rear red area exposed.

Airbrush the rear area with 'Tamiya' Red (X7).

Remove the masking.

Clean away any paint overspray on the float support struts.

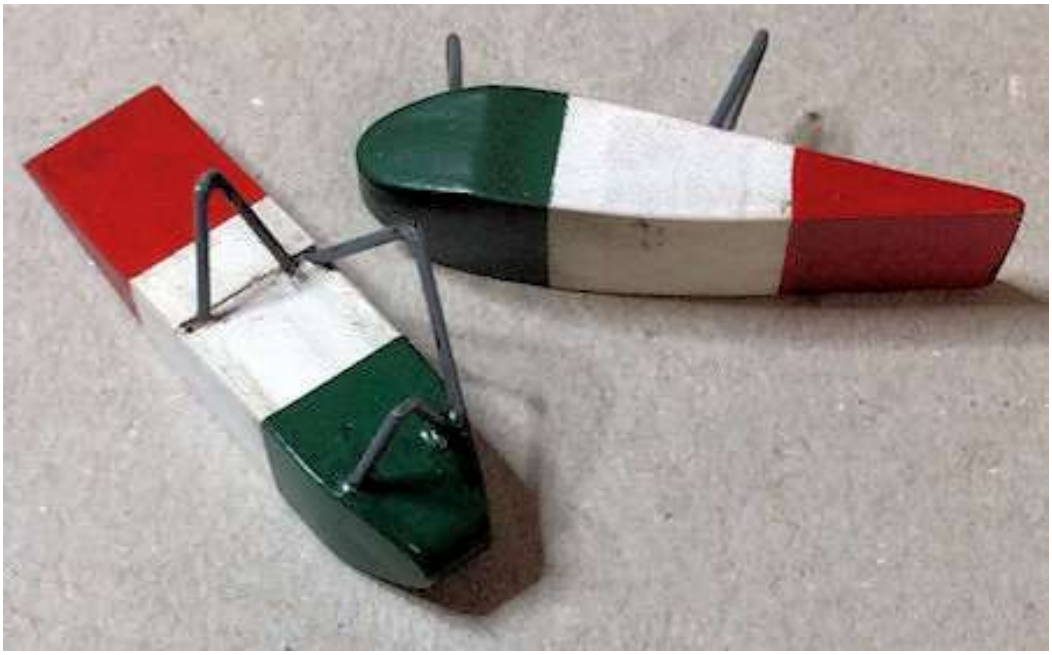
Prime the struts with a grey primer (e.g. ‘AK Interactive’ Grey AK-758 or similar).

Brush paint the struts with ‘Tamiya’ Ocean Grey (XF82).

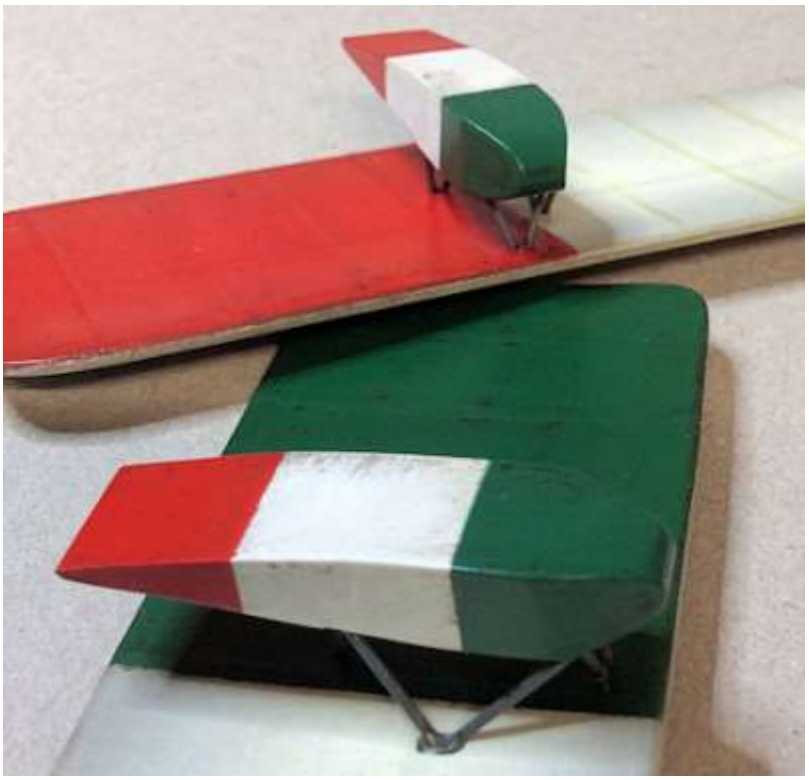
Airbrush a light sealing coat over the floats (e.g. ’Alclad’ Light Sheen ALC-311, ’Tamiya’ Semi Gloss (X35) or similar).

Refer to Part 3 of this build log (Weathering) and apply ‘Flory Models’ Dark Dirt over the floats to achieve a weathered effect.

Airbrush a light sealing coat over the floats (e.g. ’Alclad’ Light Sheen ALC-311, ’Tamiya’ Semi Gloss (X35) or similar).



Floats test fitted



Wing struts:

Interplane 'V' struts:

Prime the two 'V' struts with a grey primer (e.g. 'AK Interactive' Grey AK-758 or similar).

Airbrush 'Tamiya' Deck Tan (XF55) over the wing 'V' struts.

Refer to Part 2 (Wood Effects) of this build log and apply the desired wood effect. I chose to use 'DecoArt Crafters Acrylic' (water based) oil paint (Burnt Umber).

Airbrush a light sealing coat over the 'V' struts (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar) mixed with 'Tamiya' Clear Orange (X26).

Brush the three bands using 'Tamiya' White (XF2) with a drop of Buff (XF57).

Remove the masking.

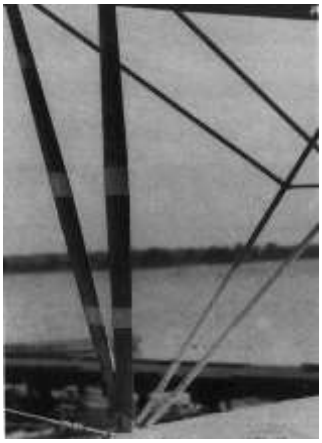
Brush paint the metal mounting plates for the engine (on the top of the two 'Z' support struts) with 'Mr. Colour' Stainless Steel (213) or similar.

Brush paint the wood beams under the engine mounting plates with 'Tamiya' Red Brown (XF64).

Airbrush a light sealing coat over the struts (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).

Refer to Part 3 of this build log (Weathering) and apply 'Flory Models' Dark Dirt over the struts to achieve a weathered effect.

Airbrush a light sealing coat over the struts (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).



Central 'Z' struts:

Prime the two lower 'Z' struts with a grey primer (e.g. 'AK Interactive' Grey AK-758 or similar).

Airbrush 'Tamiya' Ocean Grey (XF82) over the two 'Z' struts.

Brush paint the metal mounting plates for the engine (on the top of the two 'Z' support struts) with 'Mr. Colour' Stainless Steel (213) or similar.

Brush paint the wood beams under the engine mounting plates with 'Tamiya' Red Brown (XF64).

Airbrush a light sealing coat over the struts (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).

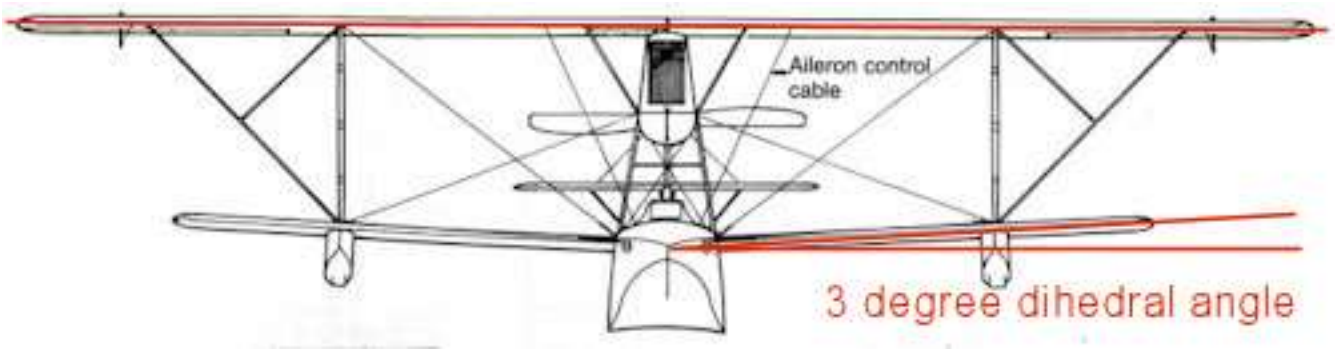
Refer to Part 3 of this build log (Weathering) and apply 'Flory Models' Dark Dirt over the struts to achieve a weathered effect.

Airbrush a light sealing coat over the struts (e.g. 'Alclad' Light Sheen ALC-311, 'Tamiya' Semi Gloss (X35) or similar).

Wings - assembly:

Secure the two halves of the lower wing to the fuselage using CA adhesive. Make sure the wings are correctly aligned when viewed from the top and the side and have the required 3 degree dihedral angle.

Secure the two halves of the upper wing together using CA adhesive. Make sure the assembled wing joint is aligned and that the wing is flat (not lifting at either end when laid on a flat surface).



Wing struts - test fitting:

NOTE: *Before continuing with the build it is advisable to check the various struts and wings fit correctly and that the wings are correctly aligned when viewed from the top and the side.*

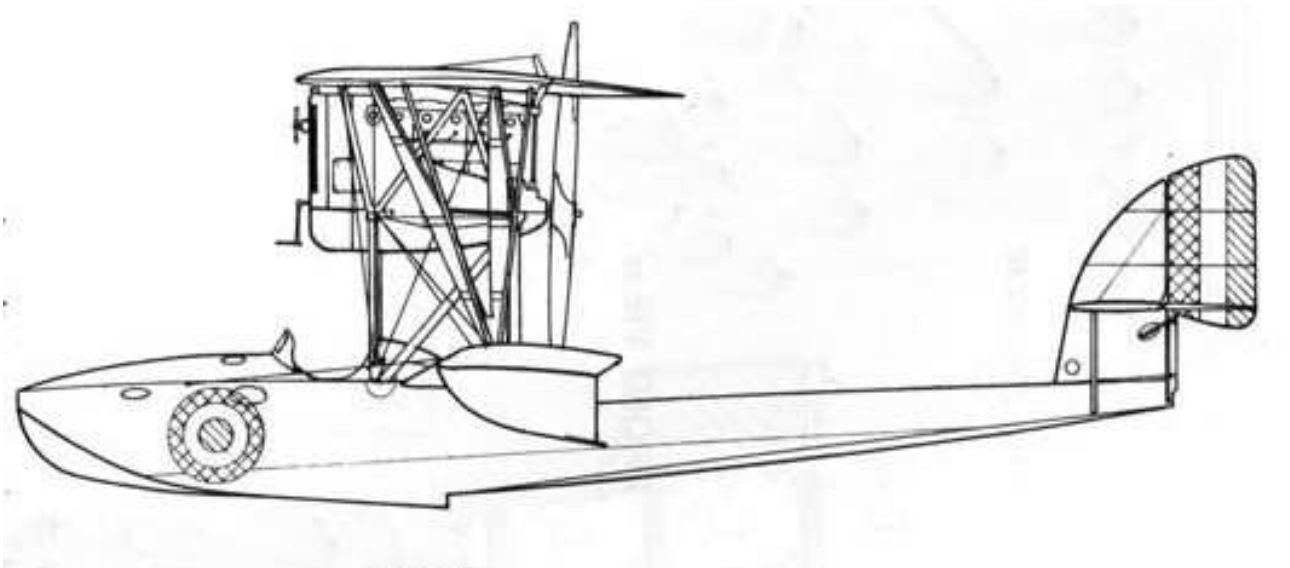
Remove residual paint from the locating pins at the ends of the wing support struts.

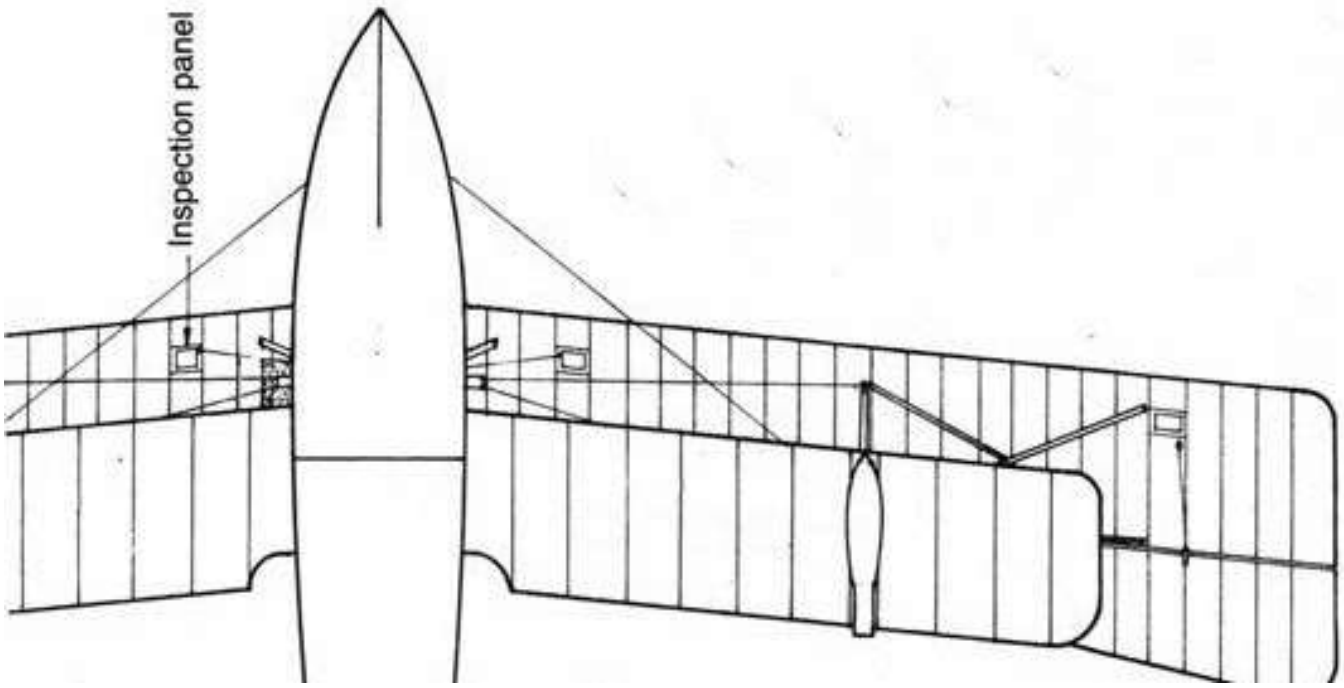
Make sure the struts locating holes pre-drilled into the upper and lower wing halves.

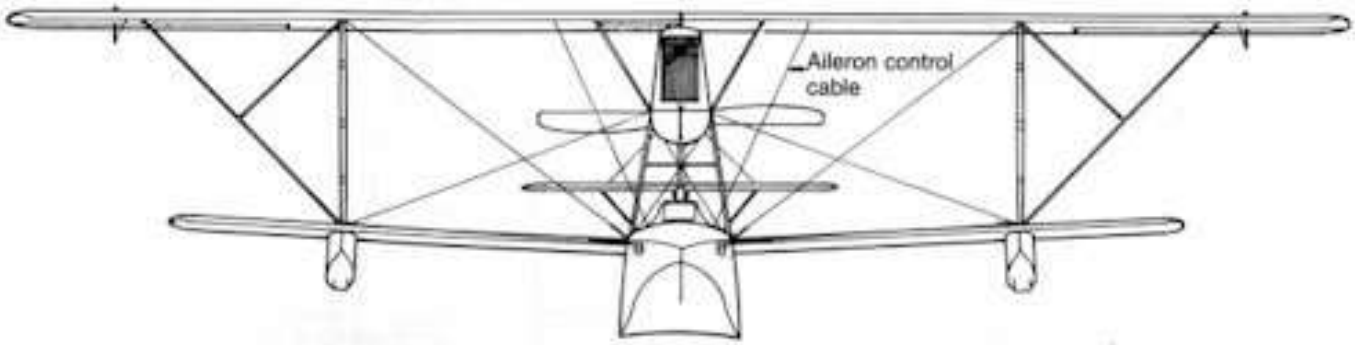
Test fit the two lower engine support 'Z' struts into their locating holes in the fuselage. Make sure they are fully seated and that the front struts are vertical (90 degrees) to the fuselage. Also make sure they are aligned to each other when viewed from the top and sides. Also dry fit the engine onto the strut support plates and ensure the engine sits vertical when viewed from the front and horizontal when viewed from the sides. It should also align with the centre line of the fuselage.

Test fit the two wing 'V' support struts into their locations on the underside of the upper wing. Make sure they are fully seated and are vertical (90 degrees) to the wing.

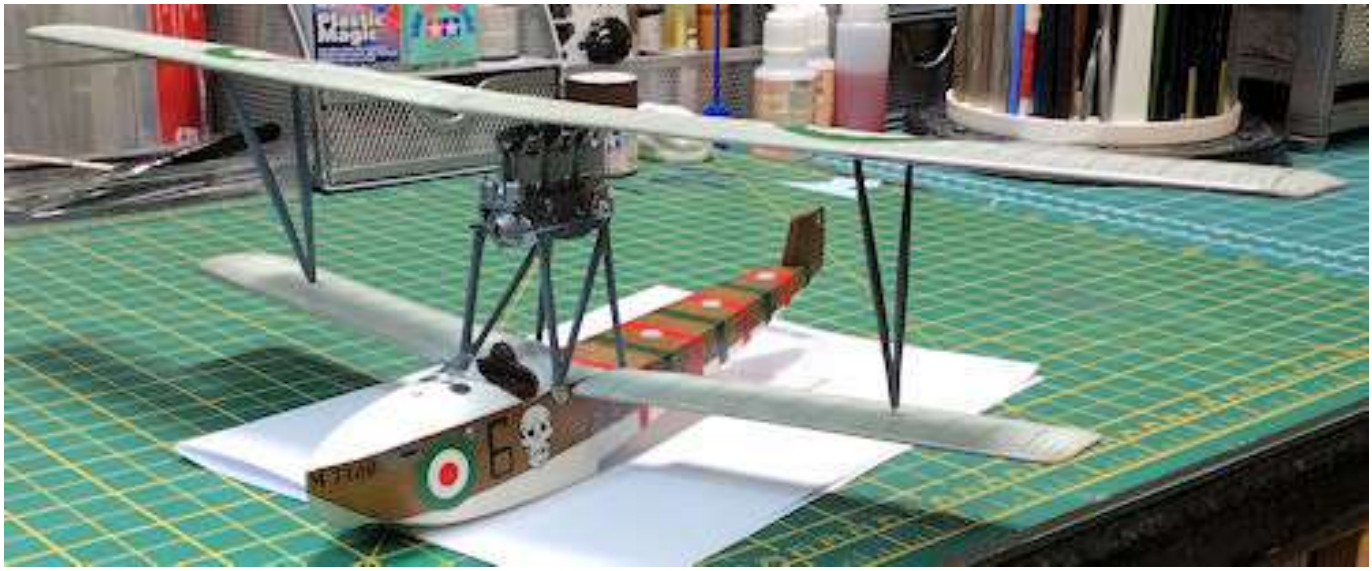
With the wing 'V' struts dry fitted into the upper wing, carefully insert the struts bottom locating pins into their locations on the top of the lower wing. Make sure the upper and lower wings are correctly aligned to each other when viewed from the top and that the angle of the wings are the same when viewed from the sides.




Inspection panel


Aileron control cable


150



Control horns - fitting:

Make sure the pre-drilled holes for fitting the various control horns are clear of decal and paint. If necessary run a 0.6 mm diameter drill into the holes.

Using CA adhesive secure the prepared control horns into the pre-drilled holes on both sides of each aileron and on the underside only of the elevators.

Prime the control horns with grey.

Carefully brush paint the horns with 'Tamiya' Ocean Grey (XF82).

Clear the rigging holes in the end of each horn using a 0.3 mm diameter drill.

Engine lower support ‘Z’ struts:

As can be seen from the following illustration and photograph, the front of the engine radiator housing was located such that its top was just rearwards from the upper wing leading edge and also that it protruded over the cockpit, with the engine cranking handle positioned over the pilots windscreen.

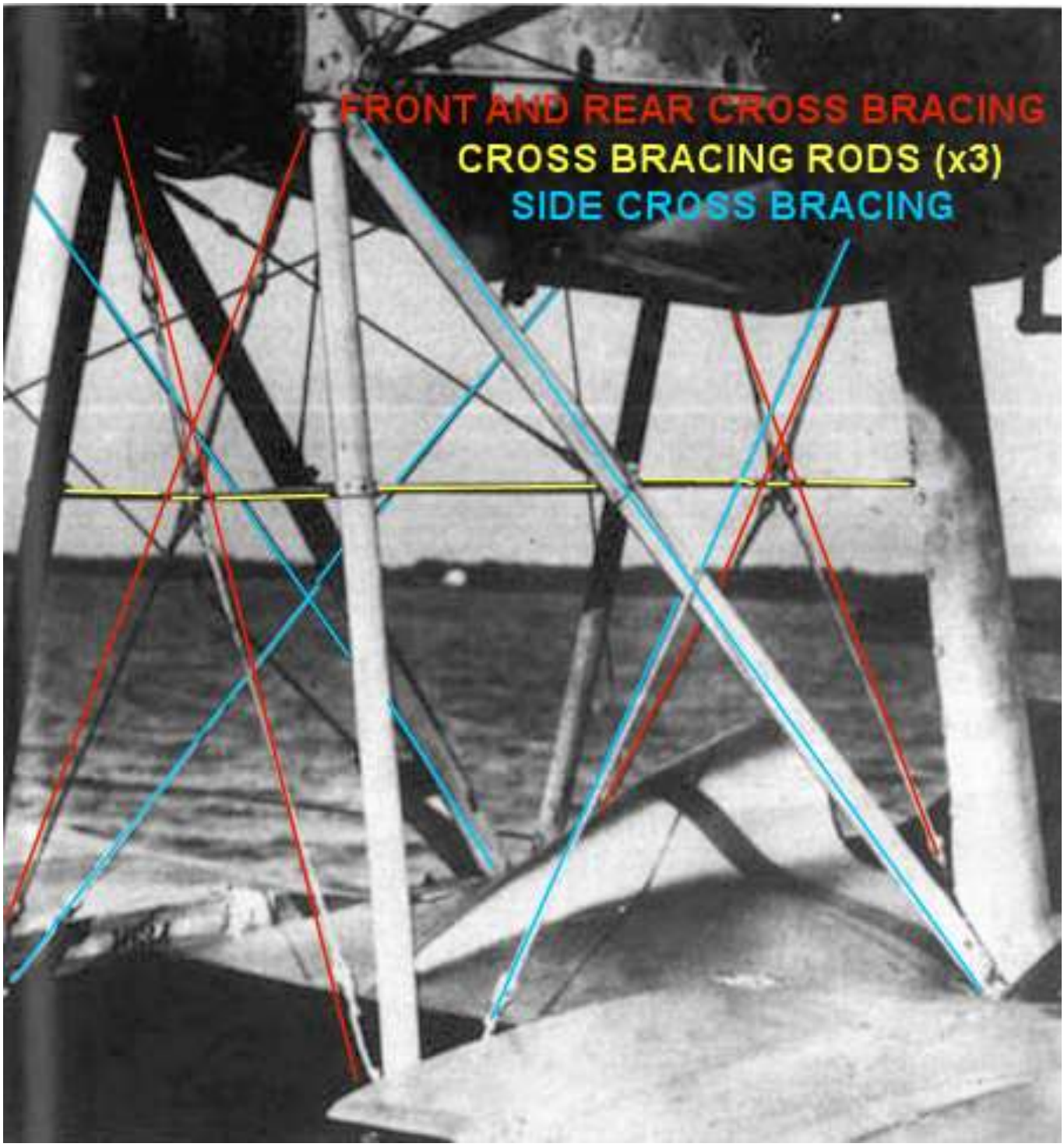
The rigging and cross bracing fitted to the engine support struts comprises bracing wires and horizontal bracing rods. **The rigging illustration (item 39) in the kit instruction is incorrect as it shows side bracing rods on the ’Z’ struts, which were not fitted. Also it does not show the centre bracing rod between the centre elements of the ’Z’ struts**.

The following photograph shows:

Diagonal cross bracing wires were fitted between the tops and bottoms of the ’Z’ struts at the sides.

Diagonal cross bracing wires were fitted between the tops and bottoms of the ’Z’ struts across the fuselage between the two ’Z’ struts.

A bracing rod was fitted between the three ‘Z’ strut elements across the fuselage.



NOTE: ***This part of the build requires that the engine support 'Z' struts, engine, radiator cowl and strut rigging and bracing need to be fitted so that the upper 'Z' struts can be configured to the upper wing.***

Cut sixteen long lengths of 0.12 mm diameter 'Steelon' mono-filament.

Cut twenty eight short lengths of 0.5 mm diameter tube (e.g. 'Albion Alloy's MBT05 or similar).

Prepare eight 'Gaspatch' 1:48th scale turnbuckles (Type C).

NOTE: *Refer to the following photograph for rigging positioning.*

Side cross bracing:

Pass a mono-filament line through the eye of an anchor point at the top of the 'Z' strut.

Slide a cut tube onto the line.

Loop the line back and through the tube.

Slide the tube up to, but not touching, the eye of the anchor point.

Secure the tube to the lines with thin CA adhesive.

Carefully cut away the free ‘tail’ of the line at the tube, leaving one line intact.

Slide a cut tube onto the line.

Pass the line through the eye of a ‘Gaspatch’ Type C turnbuckle.

Pass the free end of the line back and through the tube.

Hold the free end of the line and pass the tube up to, but not touching, the eye of the turnbuckle.

Secure the line to the tube with thin CA adhesive.

Carefully cut away the free ‘tail’ of the line at the tube.

NOTE: *During the following step, do not overtighten the line as this will flex the resin strut out of position. The line can be tightened mor, if needed, once the struts are fitted to the fuselage.*

Repeat the above procedure from the diagonally opposite corner of the ‘Z’ strut, to complete the cross bracing line.

Repeat the procedure to create the other side cross bracing line.

Repeat this procedure on the other ‘Z’ strut.

Front and rear cross bracing:

NOTE: *The following procedure should be carried out on the four remaining anchor points on top of both ‘Z’ struts. These lines need to be long so they will reach the turnbuckle lines at bottom anchor points on the opposite ’Z’ strut.*

Pass a mono-filament line through the eye of a remaining top anchor point on the ‘Z’ strut.

Slide a cut tube onto a line.

Loop the line back and through the tube.

Slide the tube up to, but not touching, the eye of the anchor point.

Secure the tube to the lines with thin CA adhesive.

Carefully cut away the free ‘tail’ of the line at the tube, leaving one line intact.

NOTE 1: *The following procedure should be carried out on the four remaining anchor points on bottom of both ‘Z’ struts. These lines need to be short so the fitted turnbuckles are closer to the fuselage.*

Pass a mono-filament line through the eye of an anchor point at the bottom of the ‘Z’ strut.

Slide a cut tube onto the line.

Loop the line back and through the tube.

Slide the tube up to, but not touching, the eye of the anchor point.

Secure the tube to the lines with thin CA adhesive.

Carefully cut away the free ‘tail’ of the line at the tube, leaving one line intact.

Slide a cut tube onto the line.

Pass the line through the eye of a ‘Gaspatch’ Type C turnbuckle.

Pass the free end of the line back and through the tube.

Hold the free end of the line and pass the tube up to, but not touching, the eye of the turnbuckle.

Secure the line to the tube with thin CA adhesive.

Carefully cut away the free ‘tail’ of the line at the tube.

Interconnecting rigging:

Place the two ‘Z’ struts together as they will be fitted to the fuselage.

NOTE: *The following steps should be carried out on the four longer lines at the top of both ‘Z’ struts.*

Slide a cut tube onto the line.

Pass the line through the eye of the ‘Gaspatch’ Type C turnbuckle at the bottom of the opposite ‘Z’ strut..

Pass the free end of the line back and through the tube.

NOTE: ***During the following step, leave plenty of slack in the line to allow for final adjustment when the ‘Z’ struts are finally fitted to the fuselage. Do not secure the line to the tube.***

Hold the free end of the line and pass the tube up close to, but not touching, the eye of the turnbuckle.

The two ‘Z’ struts should now have interconnected front and rear cross bracing lines.

‘Engine support ‘Z’ struts - fit:

Apply CA adhesive to the four locating pins at the bottoms of the front and rear struts of the ‘Z’ struts.

Carefully, but quickly, insert the struts fully into their pre-drilled fuselage locating holes.

NOTE: *The front and rear cross bracing lines are still slack.*

Cranking handle:

At the pre-moulded ‘dimple’ in the lower front of the radiator housing, drill through using a 1.0 mm diameter drill.

Insert the cranking handle (kit part 36) into the hole and secure using CA adhesive.

Brush paint the handle with ’Mr. Colour Iron (212) or similar.

Brush paint the hand grip of the handle with ’Tamiya’ Hull Red (XF9).

Radiator filler pipe:

Sand or file the radiator filler pipe (kit part 37) to approximately half of its original height (to clear the upper wing when fitted).

Secure the filler pipe over the pre-moulded ‘dimple’ in the top front of the radiator housing.

Brush paint the body of the filler pipe with ’Mr. Colour Iron (212) or similar.

Brush paint the cap of the filler pipe with ’Mr. Colour’ Brass (219) or similar.

Radiator housing:

NOTE 1: *Before the cross bracing lines on the engine support ‘Z’ struts can be finalized, the Radiator housing should be fitted, as this will add rigidity to the ‘Z’ struts.*

NOTE 2: *The engine support ‘Z’ struts have no means of locating onto the underside of the photo -etch engine bearer plates on the to of the ’Z’ struts. Using CA adhesive is to secure the housing to the photo-etch plates is not practicable, as joint of CA adhesive are prone to break if subjected to loading. Therefore using a strong, two part epoxy adhesive, such as ’Araldite Rapid’ is preferable.*

Mix an amount of two part epoxy adhesive (e.g. 'Araldite Rapid' or similar).

Apply the adhesive along the underside of the photo-etch bearer plate on both engine support 'Z' struts.

From between the front of the struts, carefully move the radiator housing in and up, to fully locate onto the underside of the plates.

Pass a strip of masking tape under the housing, between the struts then wrap the tape around the housing to draw it up against the underside of the plates.

Make sure the radiator housing is fully located under the plates and that it is vertical to the fuselage when viewed from the front.

Leave the adhesive overnight to allow it to fully set.

Remove the strip of masking tape.

Cross bracing - final rigging:

NOTE: *The front and rear cross bracing lines should still be slack and not secured at each of the four turnbuckles fitted at the bottom of the front and rear engine support 'Z' struts.*

At the four locations, hold the free end of the exposed line from the tube and gently pull to tighten the line, at the same time moving the tube up to the eye of the turnbuckle.

Secure the line to the tube with thin CA adhesive.

Carefully cut away the free 'tail' of the line at the tube.

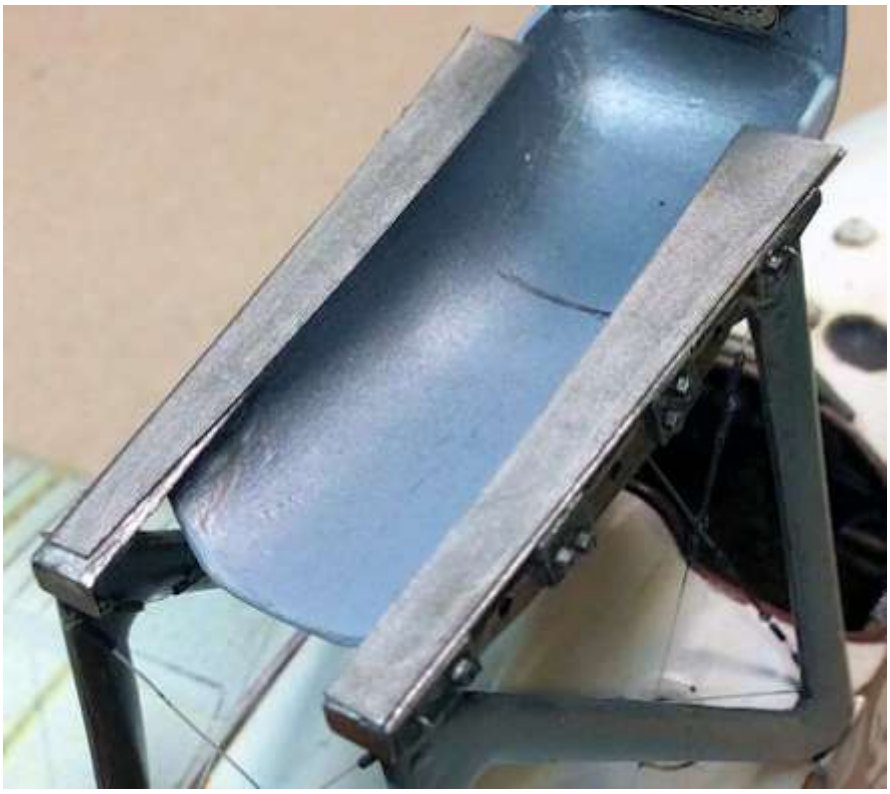
If there is too much slack in a line, it can be tightened by carefully applying heat close to and along the line. Always keep the heat source moving and don't get too close to the line or it will melt. I use heat from a small electrical soldering iron.

Brush paint all turnbuckles and tubes with 'Mr. Colour' Iron (219) or similar.

Brush paint the centre barrel of all turnbuckles with 'Tamiya' Hull Red (XF9), thinned with X20A.

Engine fit adjustments:

Despite previously heavily scrapping and sanding the sump area of the engine so it would fit into the radiator housing, I found at this stage the engine would still not locate fully into the housing once the housing had been fitted to the engine support 'Z' struts. Also the struts spayed out towards the front, leaving a gap between the photo-etch engine bearer plates and the engine/ sump flange bolts.
This required even more scrapping of the engine sump to allow it to seat fully into the radiator housing. The gaps were reduced by adding 0.3 mm thick plastic card to the bearer plates. 'Mr. Colour' Stainless Steel (213) was brushed over the scrapped areas and the plastic card inserts then brushed with 'AK Interactive' Kerosene (AK2039).



Cross bracing rods:

The engine to upper wing 'Z' struts were braced with rods, located horizontally across the fuselage between the front, centre and rear struts. The rods intersected the cross over of the bracing lines between the front and rear struts (refer to photograph on page 208).

NOTE: *The resin engine 'Z' struts have reinforcing steel will rods moulded inside and along the length of the struts. Ideally these rods should be central throughout the length of the struts, but they are not. Care needs to be taken when drilling through the struts, to avoid hitting the steel rods. Drilling slightly off-centre may stop this happening.*

On the outside of one of the rear struts, mark the strut inline with where the rear cross bracing lines intersect.

Drill a hole of 0.5 mm diameter horizontally through the strut.

Pass a length of 0.4 mm diameter tube (e.g. 'Albion Alloy's' Nickel-Silver NST04 or similar) through the hole and across to the inside of the opposite strut.

Make sure the tube is horizontal to the fuselage and mark the outside of the strut to align with the tube.

At the mark, drill a hole of 0.5 mm diameter horizontally through the strut.

Pass the tube through both holes and check it is horizontal to the fuselage and as far as possible at 90 degrees to the fuselage sides when viewed from above.

If necessary, correct any slight misalignment by drilling out the holes slightly larger.

Repeat the procedure on the front struts.

With tubes through the front and rear struts, lay a length of tube across the two tubes and mark the outside of one of the diagonal struts inline with the tube.

Using that mark as a guide, repeat the procedure to create the third, centre bracing rod.

Trim the length of each rod so that approximately 1.0 mm is left protruding from the outside of each strut.

Brush paint twelve plates (item 43) from ('PART' photo-etch for Fokker Dr.1 -S32-023) with 'Tamiya' Ocean Grey (XF82).

Remove the twelve plates from the photo-etch sheet and remove any edge 'tags'.

Pass the rear bracing tube through one hole in the rear struts.

Slide two plates onto the rod.

Pass the tube through the hole in the opposite rear strut.

Make sure the tube protrudes equally from both struts and secure in position using CA adhesive.

Secure the two plates on the tube to the inside of the rear struts using CA adhesive.

Locate a plate and a nut ('RB Motion' Aluminium Nuts Hex 0.79mm -1281A) onto the protruding tube at the outside of both rear struts.

Brush paint the tube and nuts with 'Tamiya' Ocean Grey (XF82).

Repeat to fit the bracing rods to the centre and front struts.

Fuel pump:

The wind driven fuel pressurisation pump was normally located on support struts, which were fitted to the top, front face of the engine radiator. However, as with some other Macchi M.5 aircraft, the pump on this particular aircraft was re-located to the centre cross bracing rod, which was located centrally on the cross bracing rod, between the diagonals of the engine support struts.

NOTE: *The kit supplied photo-etch parts for the wind driven pressure pump were not used as the location for the pump is different on this model. The propeller used was from my 'spares' box.*

Cut away and retain the 'nose' from kit part 35 and discard the rest.

Clean up the nose to remove residual resin.

Drill a hole of 0.5 mm diameter part way into the nose to fit a pipe later.

Cut a notch part way into the cylindrical body and on the opposite side to the drilled hole.

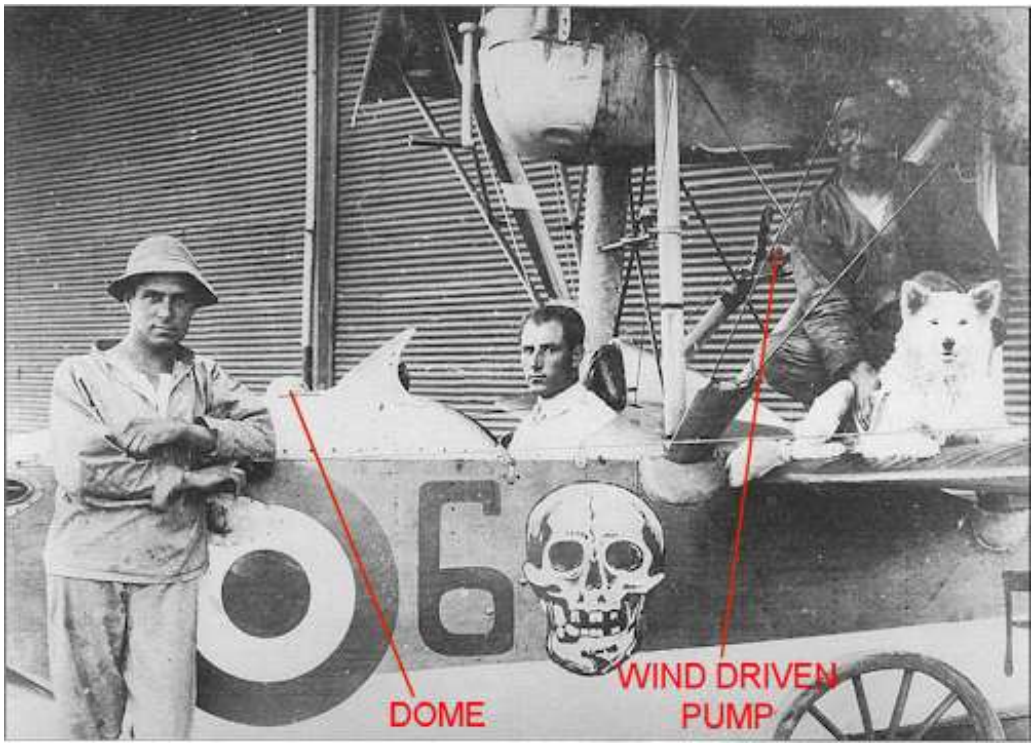
Brush paint the part with 'Tamiya' Ocean Grey (XF82).

Brush paint the propeller with 'Tamiya' Hull Red (XF9).

Using CA adhesive, secure a long length of 0.4 mm diameter 'PlusModel' lead wire into the drilled hole.

Secure the propeller onto the front of the cylindrical body with CA adhesive.

Use CA adhesive to secure the pump assembly centrally onto the middle cross bracing rod between the engine support ’Z’ struts.



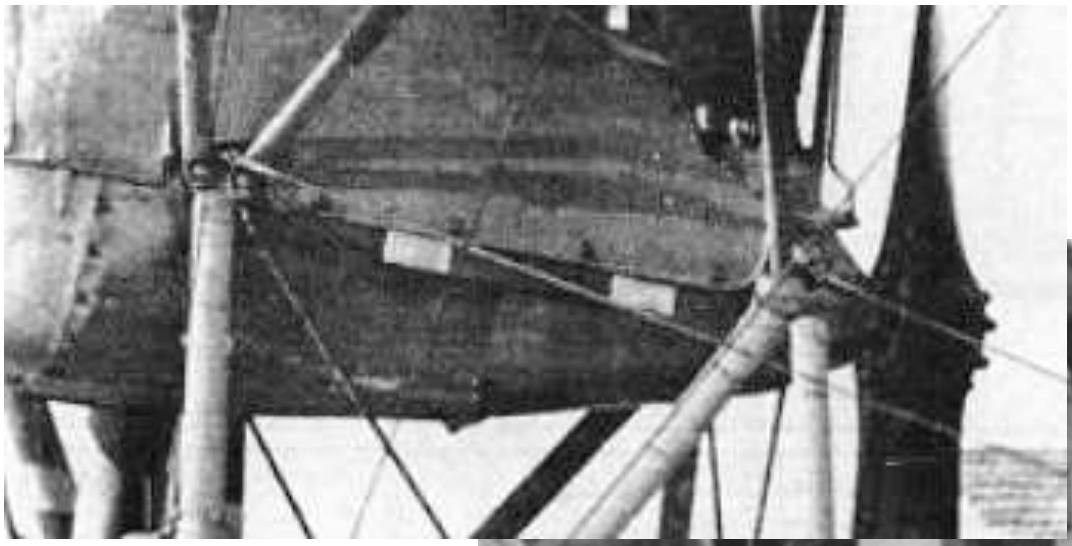
Engine upper 'Z' struts:

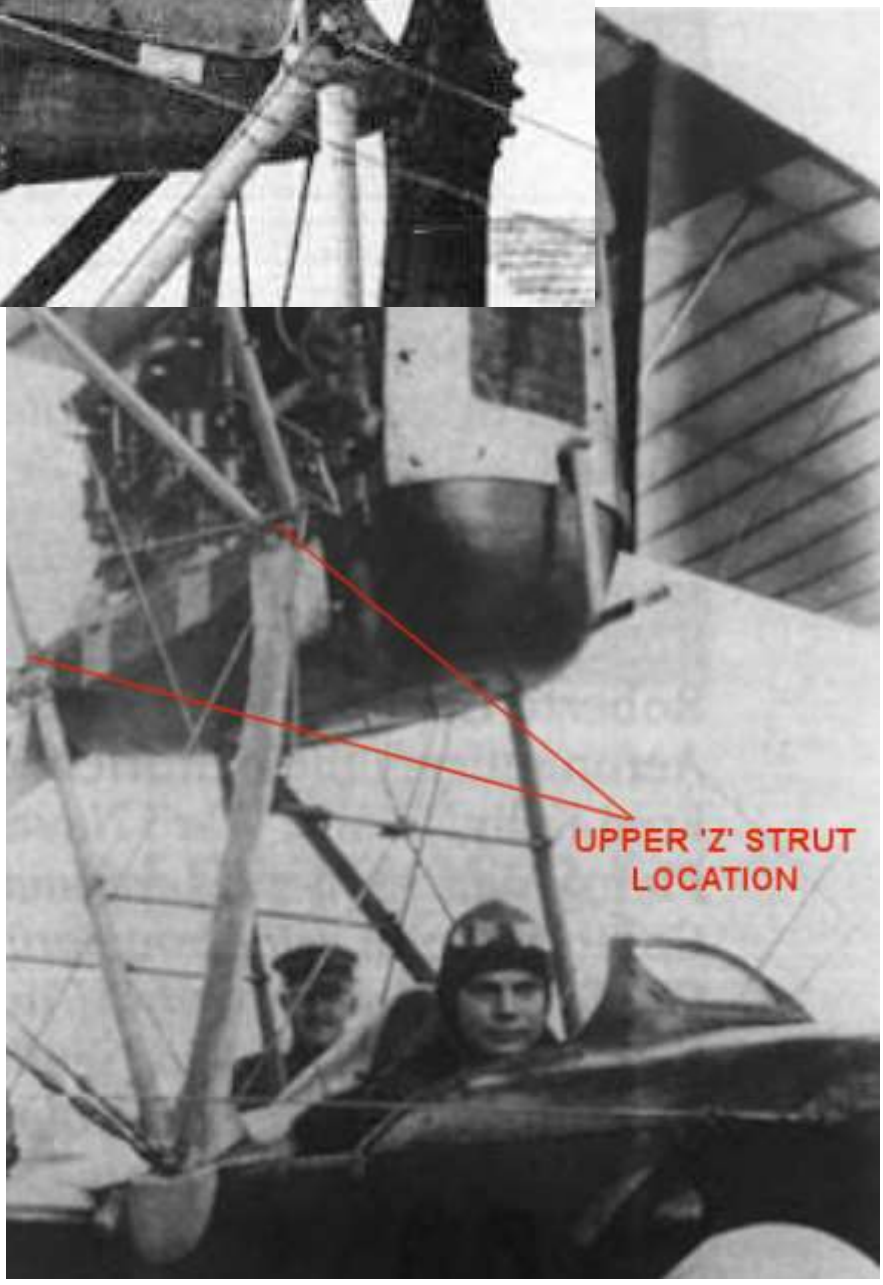
NOTE: ***I decided not to use the kit supplied upper 'Z' struts and replace them with struts created from micro-tube and rod, for the following reasons:***

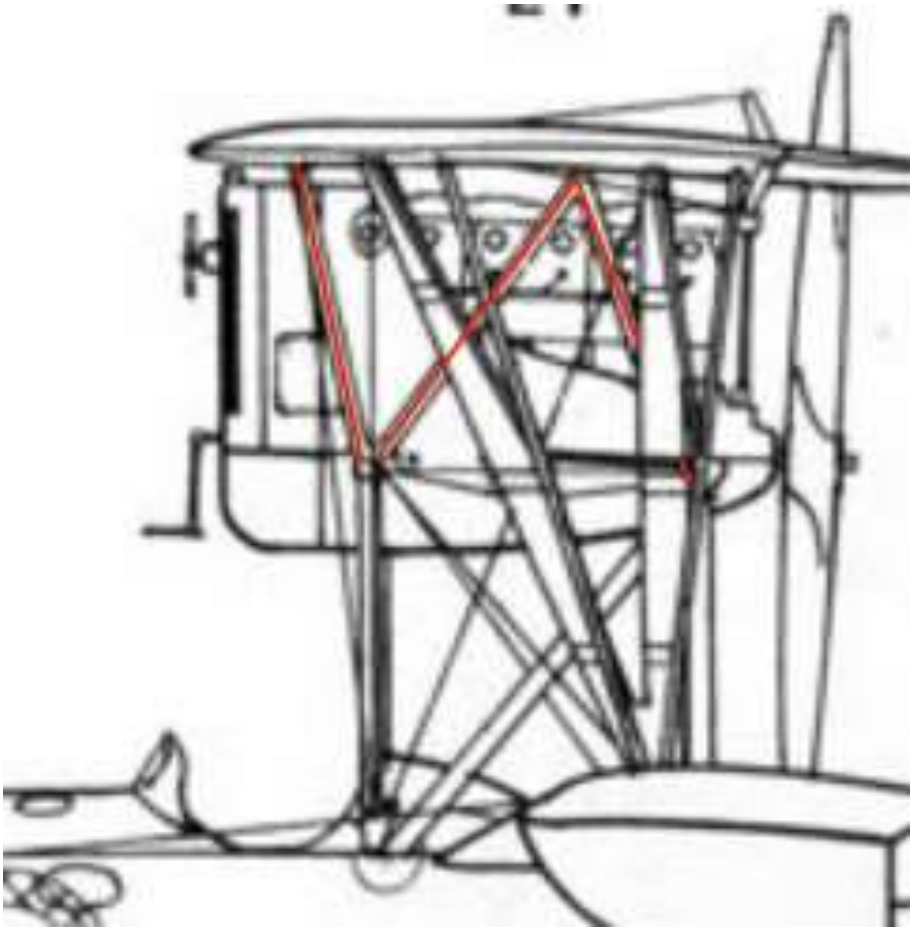
The photo-etch engine bearer plates and top of the lower engine 'Z' support struts have no locations for attaching the upper engine 'Z' struts.

When test fitted it was found that the bottom of the struts on the two upper 'Z' struts were approximately 6 mm too far rearwards and therefore not aligned with the tops of the lower 'Z' strut assembly to which they should be attached.

The upper 'Z' struts were made of three separate struts, not one combined assembly as provided with the kit parts.

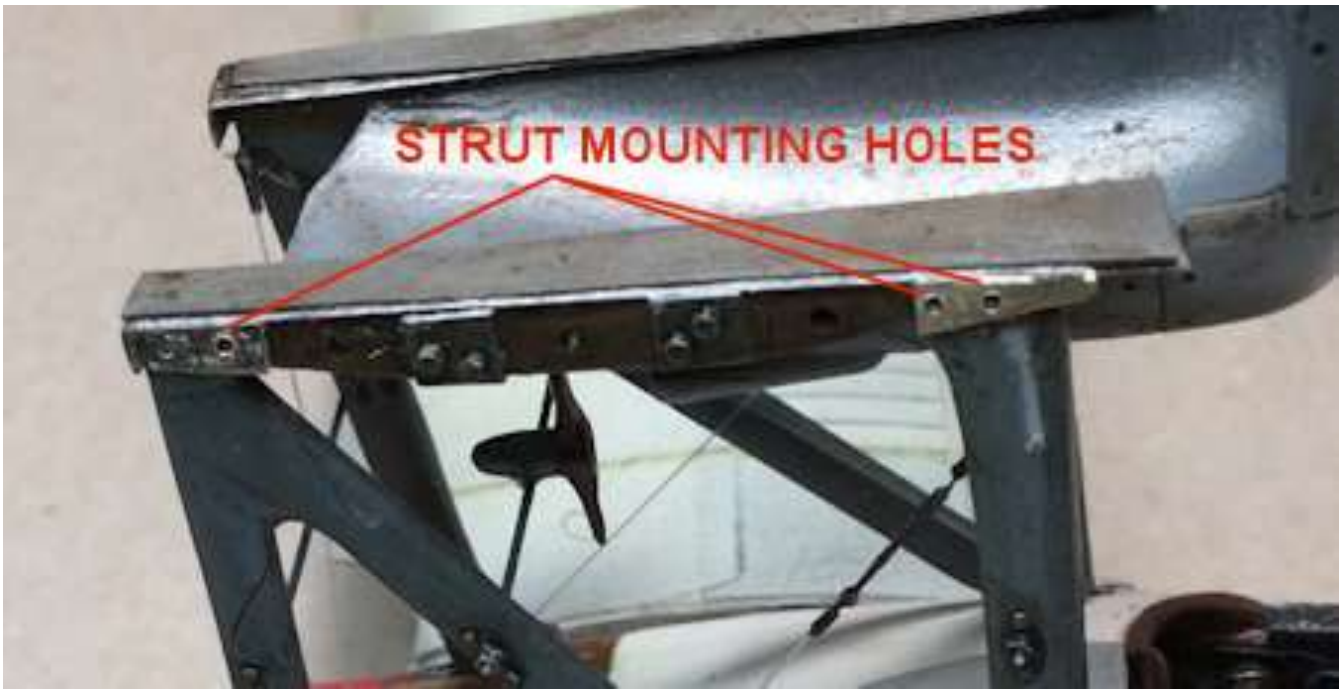






NOTE: *Care is needed when drilling through the 'Z' struts so as to avoid hitting the integral steel reinforcing rods.*

Drill holes of 0.6 mm diameter through the front and rear side plates of the photo-etch engine bearers and through the struts. To avoid breaking drills it's best to step drill the holes starting from 0.3 mm up to the final hole size of 0.6 mm diameter.



Using CA adhesive, secure the two integral locating rods on each wing support ‘V’ strut into their location holes on the underside of the upper wing. Make sure the longer strut is facing the wing leading edge.

NOTE: *During the following procedure, always make sure the struts are fully located and that the upper wing centre joint is central over the fuselage.*

Lay the upper wing down with the ‘V’ struts facing up.

Turn the fuselage/lower wing assembly upside down and carefully locate the integral steel rods into their location holes pre-drilled into the domes in the lower wings.

Support the fin of the fuselage and build up packing until the two wings are correctly aligned and the wing ’V’ struts are fully located into the lower wings.

Strut internal rods:

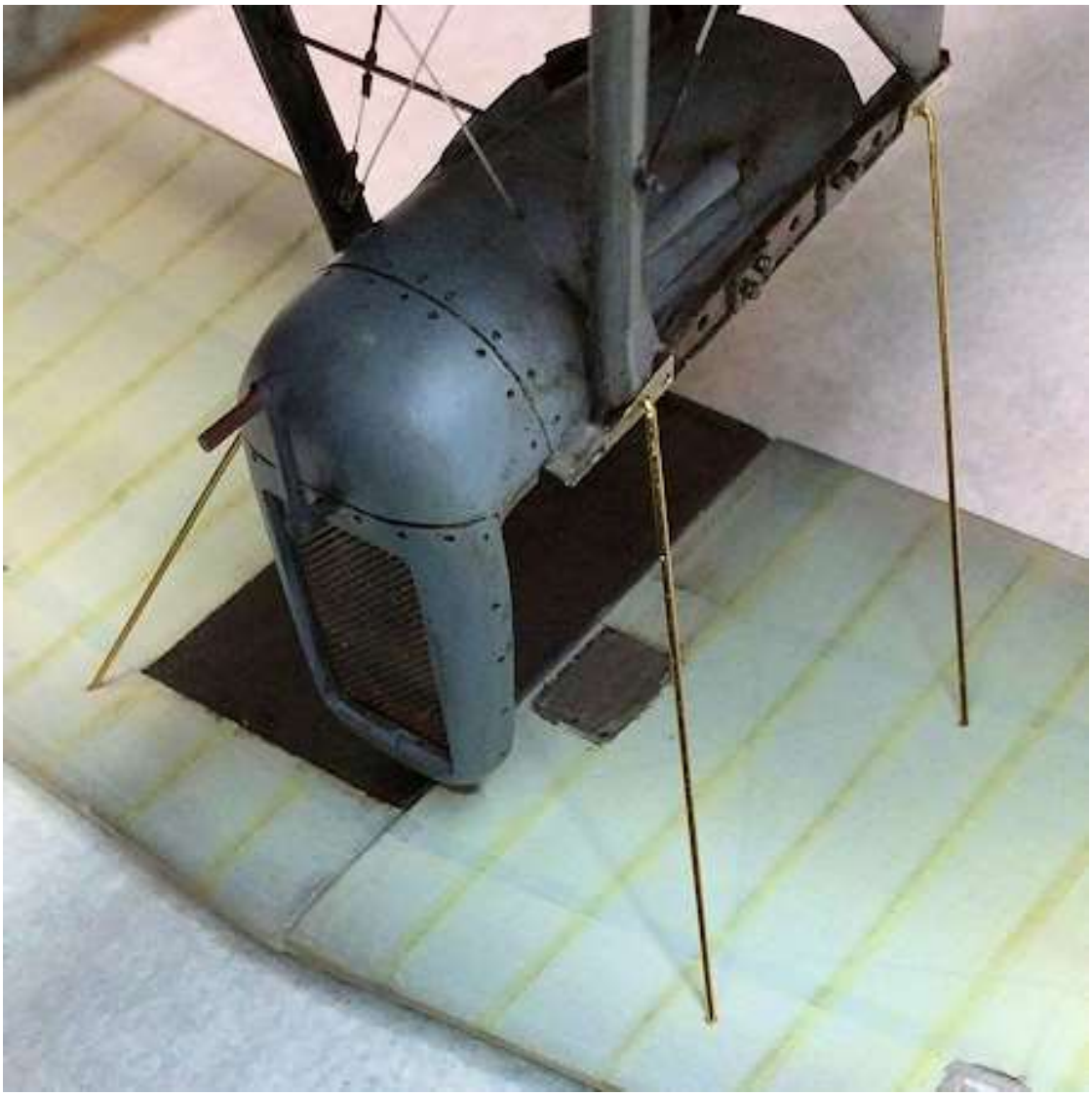
Cut a length of 0.5 mm diameter **rod** (e.g. ’Albion Alloy’s’ MBR05 or similar).

Bend one end of the rod at the approximate angle to allow it to be inserted into the forward pre-drilled hole in the photo-etch of the lower ‘Z’ strut.

Trim the length at the other end of the rod until it can be inserted in the appropriate pre-drilled location hole in the underside of the upper wing.

Repeat this to create the other three strut internal rods.

Secure the bent end of each rod into it’s location hole using CA adhesive.



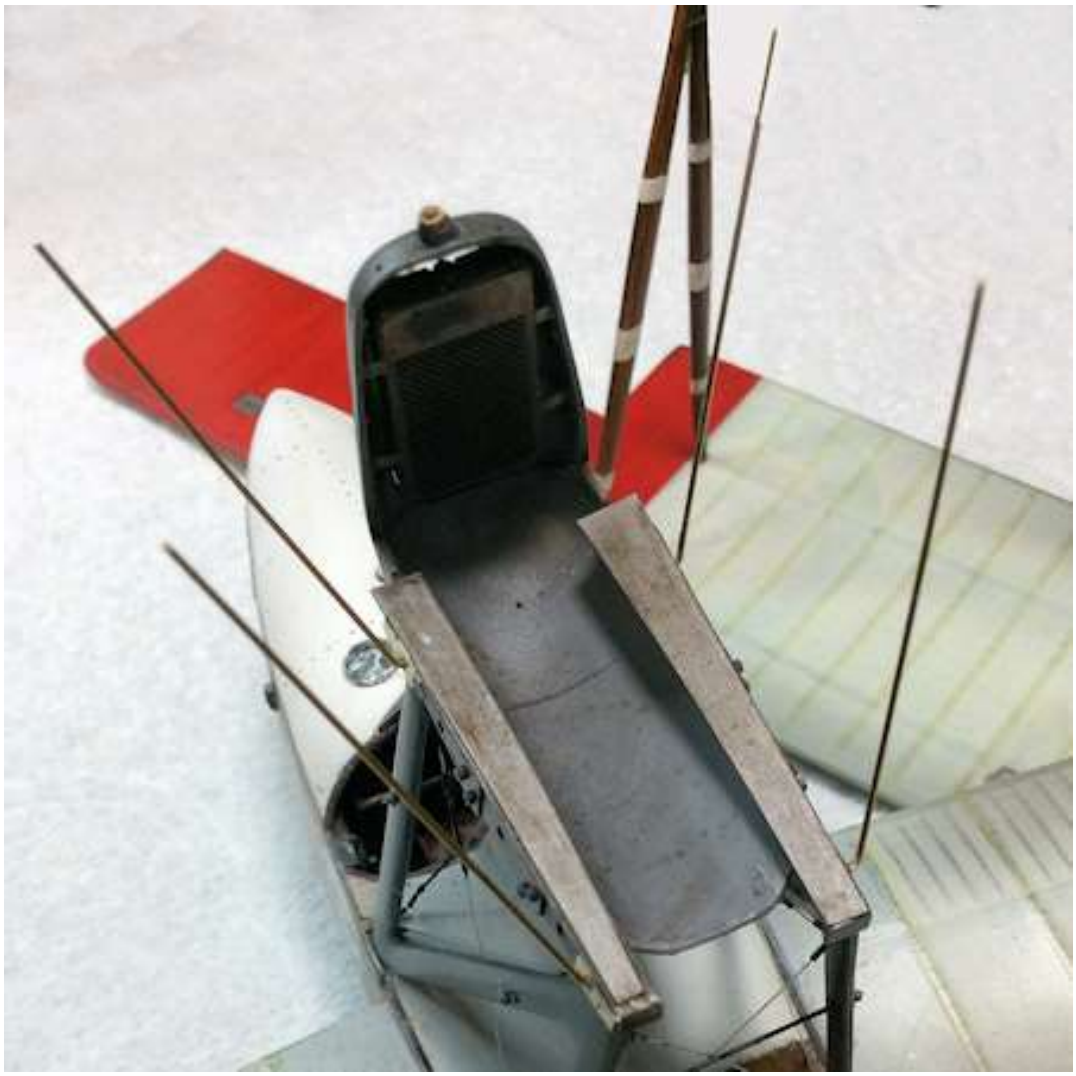
Check the alignment of both wings viewed from above and from the sides.

Carefully lift away the fuselage/lower wing assembly with the four strut internal rods in position on the engine support ‘Z’ struts.

Apply thin CA adhesive to secure the rods to the engine support ‘Z’ struts.

Locate the upper wing, as before, to make sure the four rods are correctly positioned.

Carefully lift away the fuselage/lower wing assembly with the four strut internal rods in position on the engine support ‘Z’ struts.



Strut aerofoils:

The struts are created using the ‘Strutter’ from Model Skills (‘Albion Alloy’s’). The ’Strutter’ is a pair of hardened steel jaws, one of which has two steel pins, the other has location holes for the pins. These are used in a normal medium sized bench vice. A length of tube, with an appropriate solid rod inserted is positioned across the two pins of the ’Strutter’ and the vice jaws are then tightened, which tips the ’Strutter’ jaws to crush the brass tube around the inserted rod. Unless the tube is heavily crushed, the rod should be able to be removed. Once all struts have been created they can be joined together, if required, using soft solder or CA adhesive, including inserted locating rods, which are used to attach the struts to the model. In this way the wing is supported by brass struts with solid rod attachments, which is more sturdy than the kits supplied plastic or resin struts.

The ‘Strutter’ from ‘Albion Alloy’s’.

Roll cut four lengths of 1.2 mm diameter tube (e.g., ‘Albion Alloy’s’ MBT12 or similar). The lengths of the cut tubes should be slightly longer the exposed length of the for support rods.

Slide each tube onto a length of 0.5 mm diameter rod and using the ‘Strutter’ tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil tubes.

File the end of each tube at an angle, such that when slid onto its support rod, the bottom end sits against the engine support ‘Z’ strut and covers the support rod.

File the other end of each aerofoil section at an angle with approximately 1.5 mm of support rod exposed, such that when upper wing is located onto the struts, the aerofoil section seats correctly against the underside of the wing and the support rods insert fully into the wing location holes.

Carefully test locate the upper wing onto the lower wings with the wing support ‘V’ struts fully located into their location holes on the lower wings and the four support rods fully located into their location holes in the underside of the upper wing.

Check the alignment of both wings is still correct when viewed from above and from the sides.

NOTE: *At this stage the aerofoil sections should not be secured in position on the support rods. This is because they will need to be aligned correctly on the support rods and this can only be done when the upper wing is finally fitted later in this build.*

NOTE: *The next step is to create the single cross strut that is located between the top of the rear struts and the bottom of the forward struts.*

The cross struts were created in the same manner as for the previous struts with the following exceptions:

First create the aerofoil sections to fit between the existing struts.

Cut two 10 mm lengths of 0.5 mm diameter rod and insert them into the ends of the tubes.

Secure the rods in the tubes by soft soldering.

Offer up the struts to the existing struts and bend the protruding bottom rods to allow them to be inserted in the pre-drilled hole in the lower 'Z' struts.

Bend the protruding rod at the top so it can be inserted into a hole drilled into the under side of the upper wing, forward from the existing strut locating hole.

Locate the cross struts between the existing struts and check alignment is correct.

NOTE: *During the following step, make sure each strut and aerofoil section are marked for their locations on the model. Otherwise you may find the struts will not fit correctly on final fit.*

Remove the cross struts and the aerofoil sections from the front and rear struts.

Secure a nut (‘RB Motion’ Aluminium Nuts Hex 0.79mm -1281A) onto the bottom of each of the six struts using CA adhesive.

Airbrush the six aerofoil sections with grey primer (e.g. ‘AK Interactive’ Grey AK758 or similar).

Airbrush the six aerofoil sections with ‘Tamiya’ Ocean Grey (XF82).

Drill a hole of 0.6 mm diameter into the underside of the upper wing, forward from the locating hole for the rear struts.

Rigging anchor points:

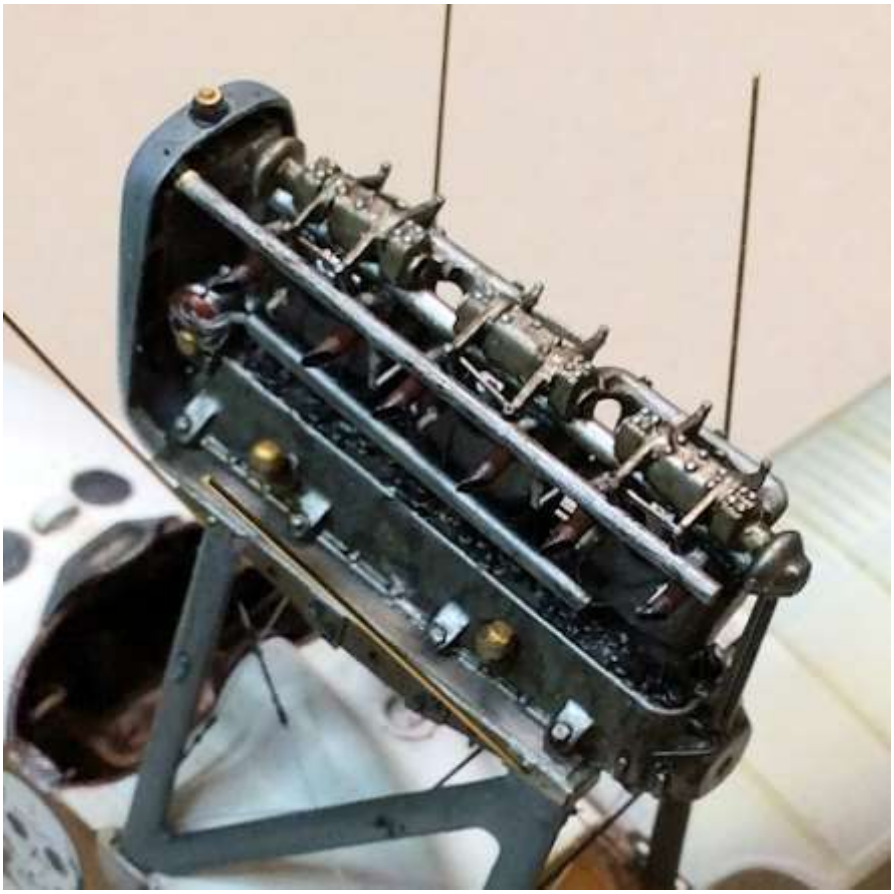
On the outer face of the front and rear struts of the lower engine support ‘Z’ struts - just below the photo-etch end plates - drill a rigging hole of 0.4 mm diameter.

Using CA adhesive secure into the pre-drilled holes a ‘Gaspatch’ 1:48th scale ‘anchor’.

Engine fit:

Apply thin CA adhesive along the underside of the engine cylinder block/oil sump flanges and to the engine mounting lugs.

Locate the engine onto the engine bearers as far forward as it will fit. Make sure the engine is fully seated onto the bearers.



Radiator support struts:

The radiator for the engine was mounted in a cowl which on many Macchi M.5 aircraft, also covered the forward sides of the engine and the engine sump area. This particular aircraft, as with others, had the engine panels of the cowl removed to leave just the radiator housed and the engine sump covered. Although I could not find photographic evidence, I assumed that the radiator cowl would have been braced with either panels or rods. For this model I decided to add bracing rods between the rear edge of the radiator cowl and the engine bearer plates.

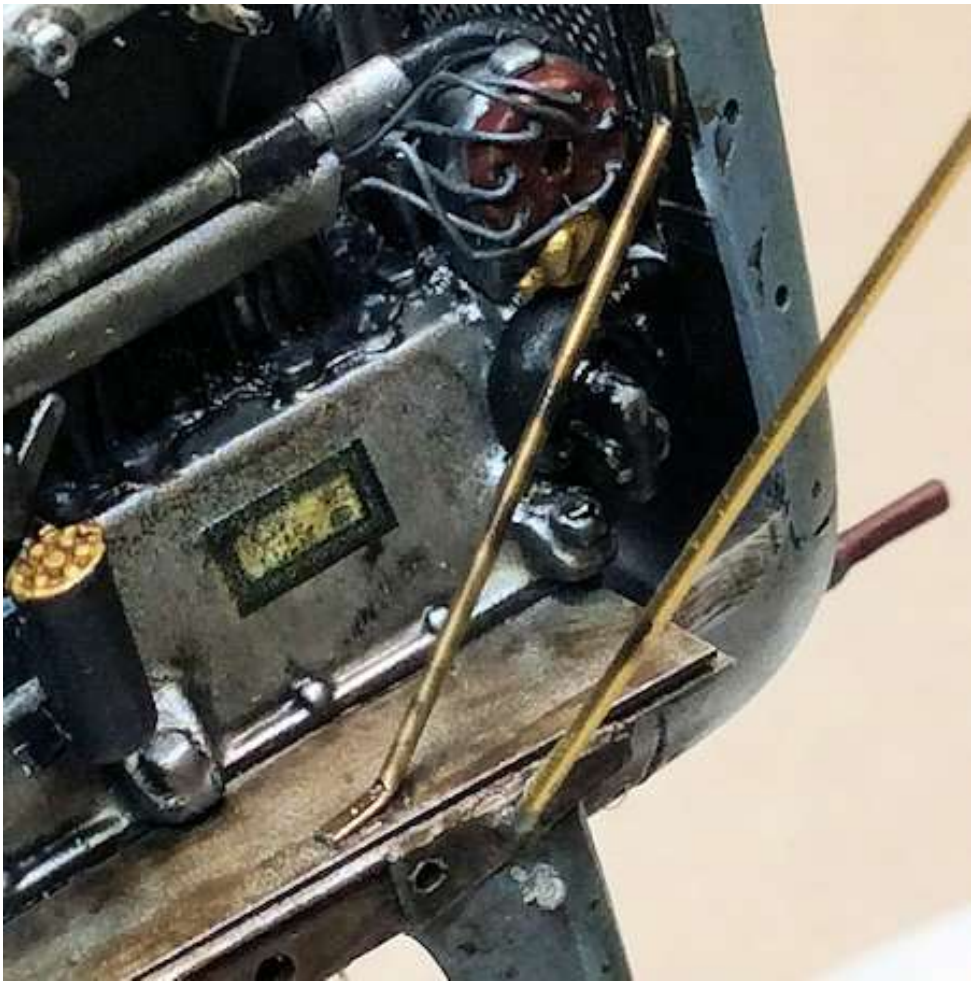
Cut a 20 mm length of 0.5 mm diameter Nickel-Silver tube (e.g. ‘Albion Alloy’s NST05 or similar).

Using flat nose pliers, flatten both end of the tube to a length of 1.5 mm and bent to 45 degrees.

Position the strut onto an engine bearer and against the rear edge of the radiator housing.

Secure in position using CA adhesive.

Repeat to create the support strut on the opposite side of the engine.



Engine control and fuel lines:
The following engine controls and pipes can now be created:

The air pressurisation pipe (for fuel tank) between wind driven pump and the fuselage fuel tank.
The auxiliary pipe from between the fuel intake manifolds.
The fuel supply pipe between the fuselage fuel tank and pipe between the engine carburettors.
Oil pressure pipe between the engine and the cockpit exit hole.
Magneto control and wiring at the engine and from the cockpit exit hole.
The throttle control from the cockpit exit hole to the two carburettors.

NOTE: *Use thin CA adhesive to secure the various controls and pipes in position.*

Air pressurisation pipe (wind driven pump to fuel tank):

Drill a hole of 0.6 mm diameter into the cockpit rear decking, just to rear of the left forward engine support 'Z' strut.

Cut a long length of 'PlusModel' 0.3 mm diameter lead wire.

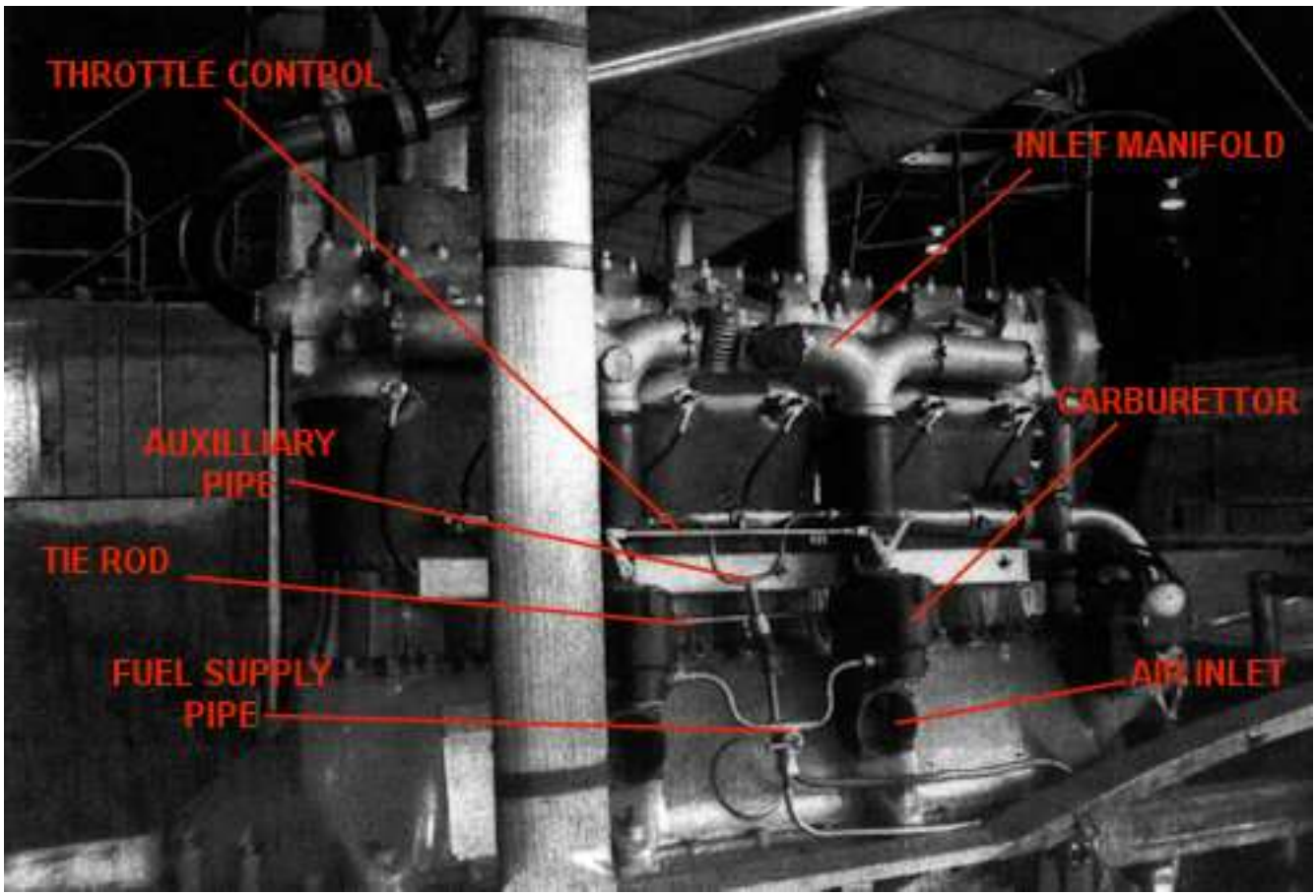
Secure one end of the wire into the drilled hole.

Route the wire up and against the outside of the strut and secure in position.

Route the wire up and along the top edge of the strut diagonal cross bar to the horizontal cross bar that has the air pump fitted. Secure in position

Route the wire across the horizontal bar to the top of the rear body of the air pump and secure in position.

Auxiliary pipe (from between the fuel intake manifolds):
NOTE: *The actual purpose of this pipe and to where it's routed is unclear. Therefore I have ended the pipe run behind the magneto on that side of the engine.*



Cut a length of 0.5 mm diameter Nickel-Silver tube (e.g. ‘Albion Alloy’s NST05 or similar).

Cut a short length of 0.8 mm diameter Brass tube (e.g. ‘Albion Alloy’s MBT08 or similar).

Bend one end of the 0.5 mm tube to 90 degrees and trim the length so that the tube lays on the engine bearer plate and touches the bottom centre of the upper pipe spanning the fuel intake manifolds.

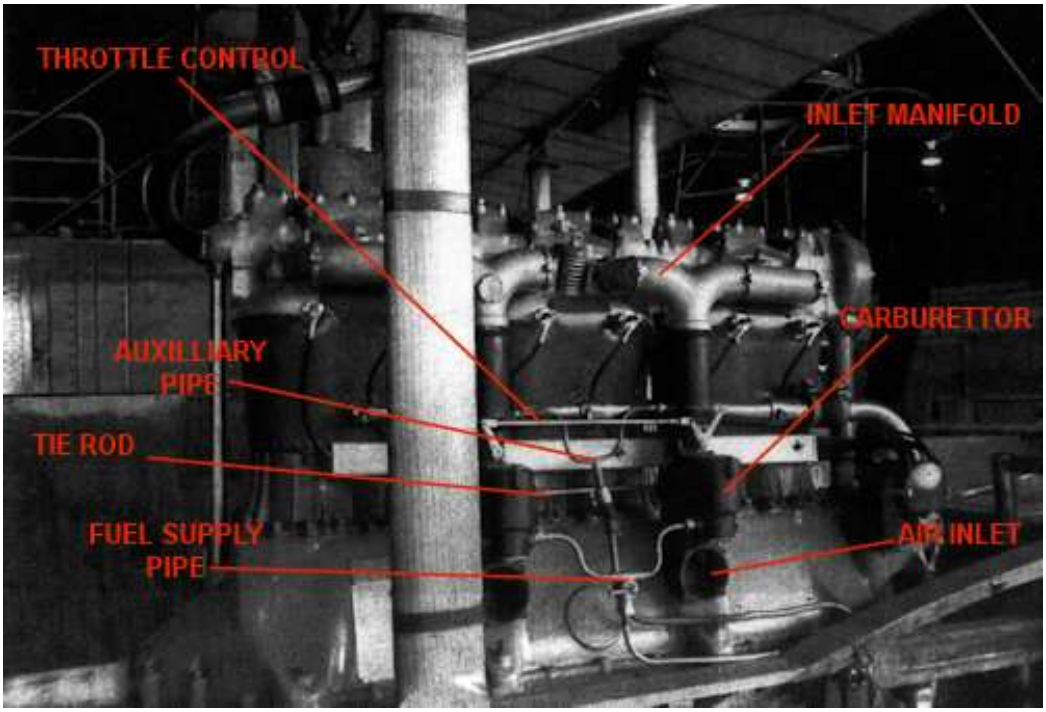
Bend the other end of the 0.5 mm tube and trim its length so that the tube bends over the front end of the engine bearer plate and down into the cavity of the engine/radiator cowl.

Slide the cut 0.8 mm tube onto the pipe and position it so that it will be just below the upper pipe spanning the fuel intake manifolds. Secure in position.

Locate the pipe assembly onto the engine bearer plate with the top of the pipe touching the upper pipe spanning the fuel intake manifolds and the other end over the front end of the engine bearer plate and down into the cavity of the engine/radiator cowl.

Secure the pipe assembly in position.

Fuel supply pipe (between the fuselage fuel tank and the pipe between the engine carburettors):



Cut a long length of 0.5 mm diameter Nickel-Silver tube (e.g. ‘Albion Alloy’s NST05 or similar).

Cut a short length of 0.8 mm diameter Brass tube (e.g. ‘Albion Alloy’s MBT08 or similar).

Cut a short length of 1.0 mm diameter Brass tube (e.g. ‘Albion Alloy’s or similar).

Drill a hole of 1.2 mm diameter through the engine bearer plate, aligned with the leading edge of the forward right strut of the right engine support ‘Z’ strut.

Bend one end of the 0.5 mm tube to 90 degrees and trim the length so that the tube lays on the engine bearer plate with the longer length passing through the drilled hole and down the strut leading edge to the strut location recess in the fuselage.

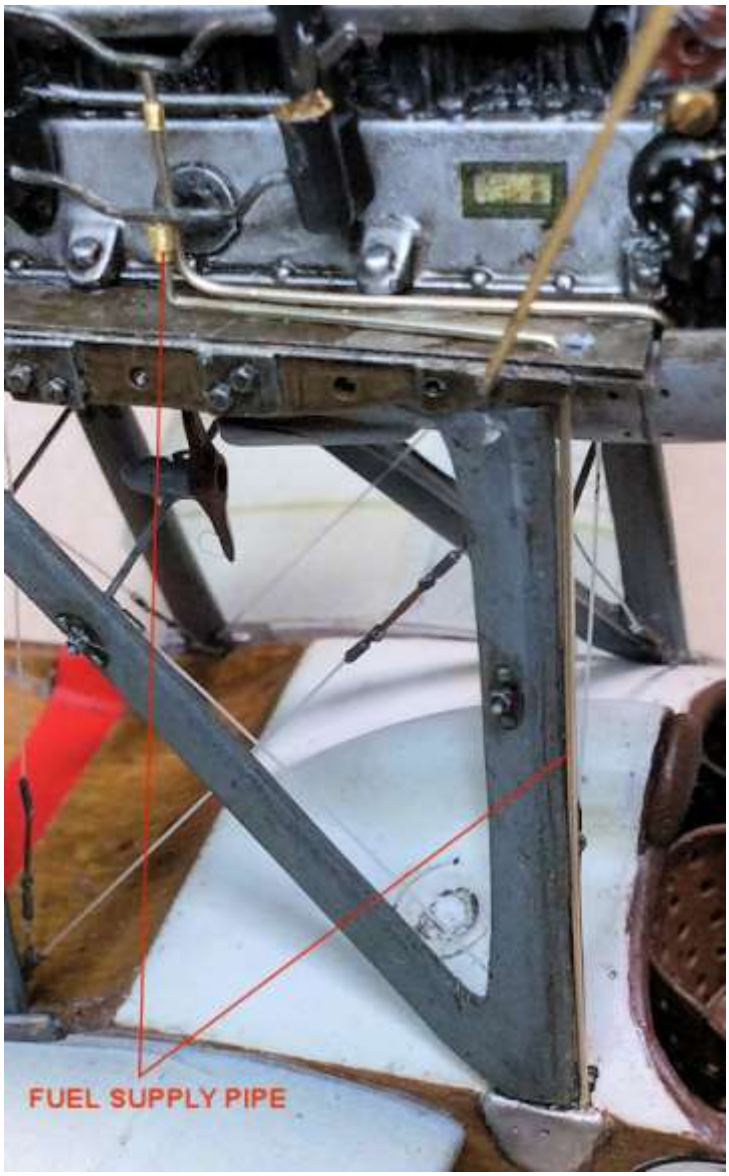
Bend the other end of the 0.5 mm tube and trim its length so that the tube bends up to touch the centre bottom of the lower pipe spanning the two carburettors.

Slide the cut 1.0 mm tube onto the 0.8 mm tube.

Slide the cut tubes onto the 0.5 mm tube at the carburettor end and position at the top of the tube. Secure in position.

Locate the pipe assembly through the hole in the engine bearer plate with the top of the pipe touching the lower pipe spanning the carburettors and the other end down the strut leading edge into the strut recess in the fuselage.

Secure the pipe assembly in position.



Oil pressure pipe (between the engine and the cockpit exit hole):

The engine oil pressure gauge is located on the cockpit instrument panel. The pipe supplying oil pressure was routed from the instrument and around the right cockpit frame to the rear of the cockpit. From there it was routed out of the cockpit and up the forward, right strut of the engine support ‘Z’ strut.

However it is unclear where, from the top of the strut, this pipe was routed and to where on the engine it was connected. It is assumed therefore that the pipe supplying engine oil pressure to the gauge was connected at the oil pump itself. The engine oil pump was located on the bottom rear of the sump, so a pressure pipe would have been routed up between the engine and the Radiator, around the magneto and then across to the hole over the leading edge of the engine support ’Z’ strut.

Starter Magneto wiring (from the cockpit exit hole):

It is assumed that the cockpit starter magneto would have been connected to the magnetos that were located on the engine.

Cut two long lengths of ‘Model Factory Hire’ (MFH) 0.4 mm black tube (P961).

Pass both tubes through the hole drilled through the engine bearer plate (used for the fuel supply pipe).

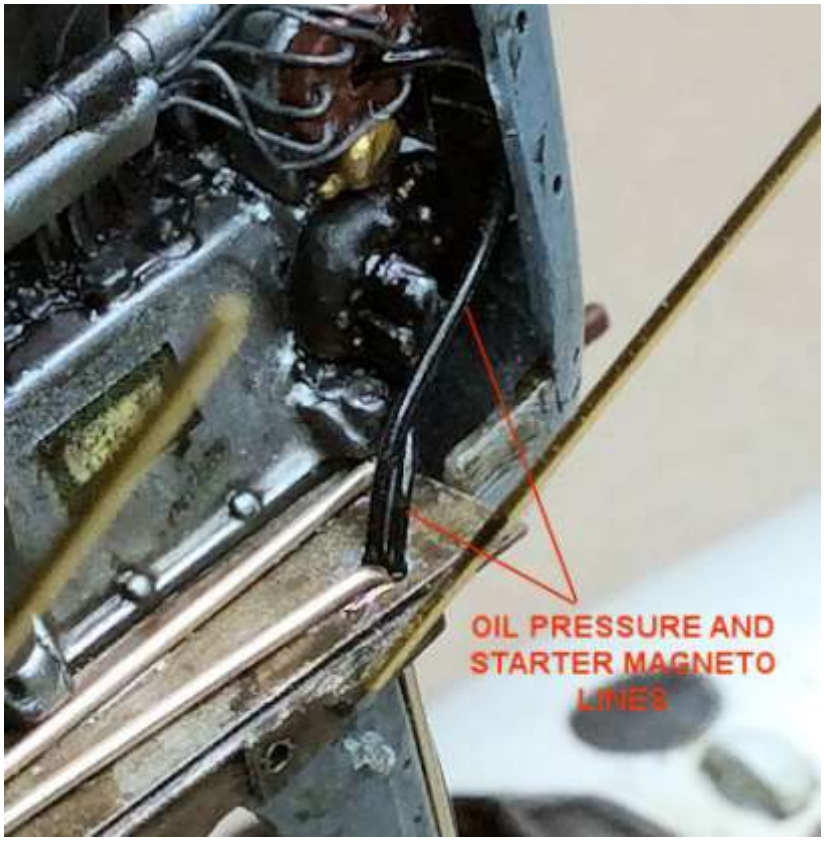
Locate the bottom of both tubes into the pre-drilled controls exit hole, adjacent to the right, forward engine support ’Z’ strut.

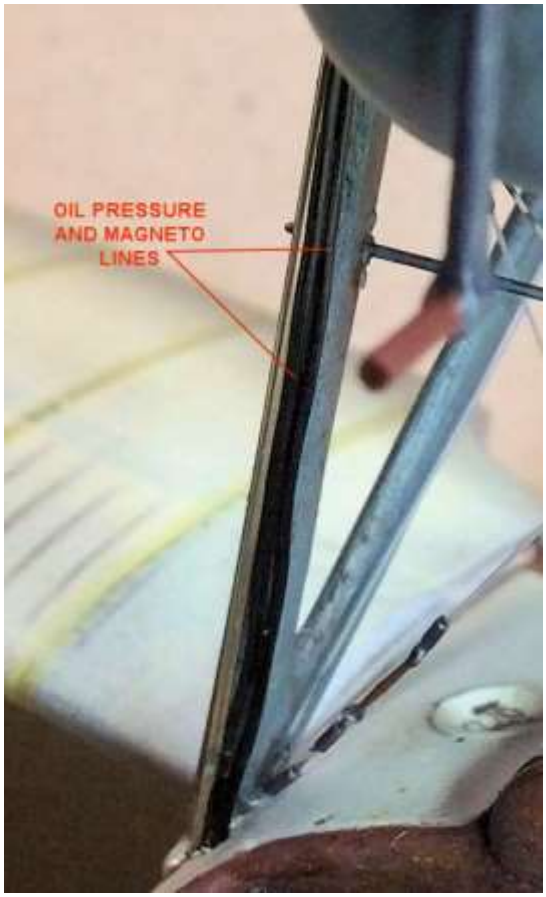
Secure the tubes in position.

Route both tubes up the inside of the fitted fuel supply pipe and secure in position against the strut.

Cut one tube so that it will bend under the magneto and secure in position.

Cut the remaining tube so that it can be looped towards the radiator then back to the centre of the magneto. Secure in position.





Throttle (from the cockpit exit hole to the carburettors) and Magneto control:

From the cockpit, a control rod was routed up the leading edge of the right, forward engine support 'Z' strut. The rod was connected to a lever, the other end of which was connected to one of two lever mounted on the forward fuel inlet manifold. The second lever connected the final control rod to a lever on the rear fuel intake manifold.

NOTE: *Model kit restrictions and engine modifications moving the engine farther forwards, meant that the throttle control rods do not accurately represent that of the real aircraft.*

Cut out a control horn and turnbuckle from the photo-etch sheet ('Part' WWI control horns and turnbuckles set (S48087).

Drill a hole of 0.4 mm diameter into the engine bearer aligned with and between the hole drilled through the bearer and the forwardmost lever on the forward fuel intake manifold.

Secure the 'tang' of the control horn into the drilled hole and align the horn to the hole drilled through the bearer and the forwardmost lever on the forward fuel intake manifold.

Secure the turnbuckle at the top of the control horn and to the hole drilled through the bearer and the forwardmost lever on the forward fuel intake manifold.

Cut lengths of 0.2 mm diameter Nickel-Silver rod (e.g. 'Albion Alloy's' NSR02 or similar).

One to span between the two levers on the fuel intake manifolds.

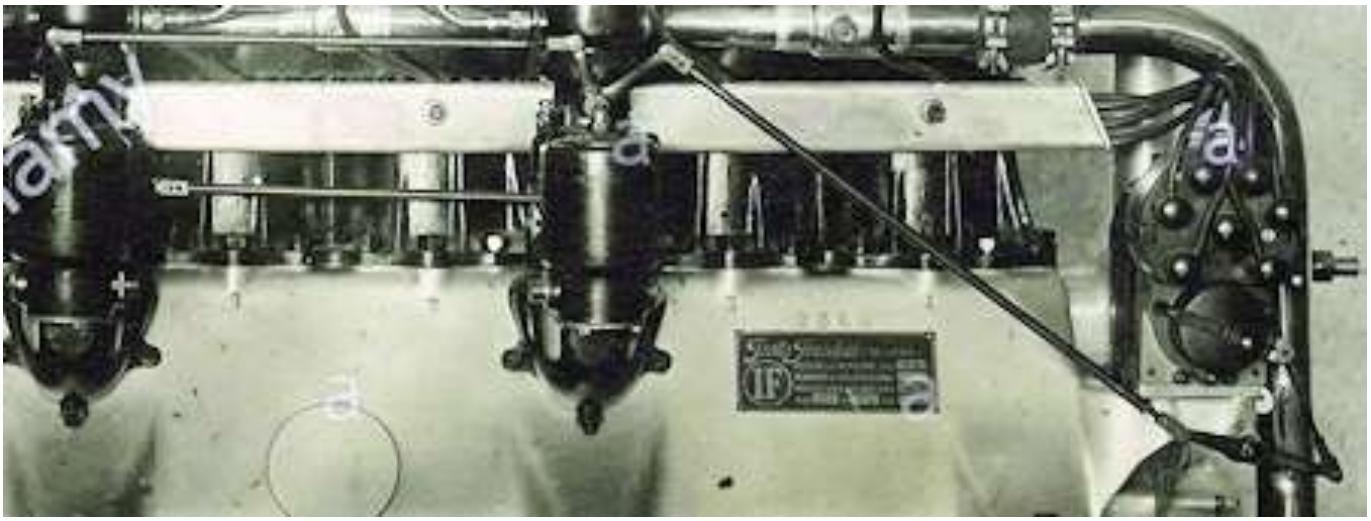
One to span between the forwardmost lever on the forward fuel intake manifold and the end of the turnbuckle.

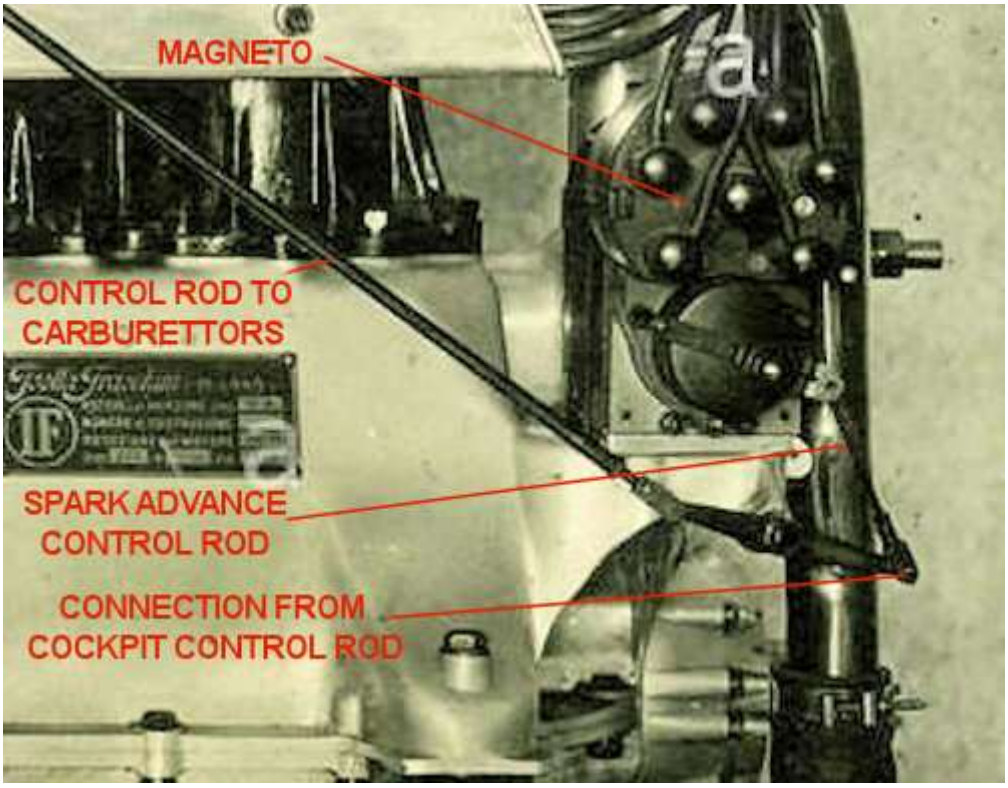
One to span between the other end of the turnbuckle and the hole in the engine bearer plate.

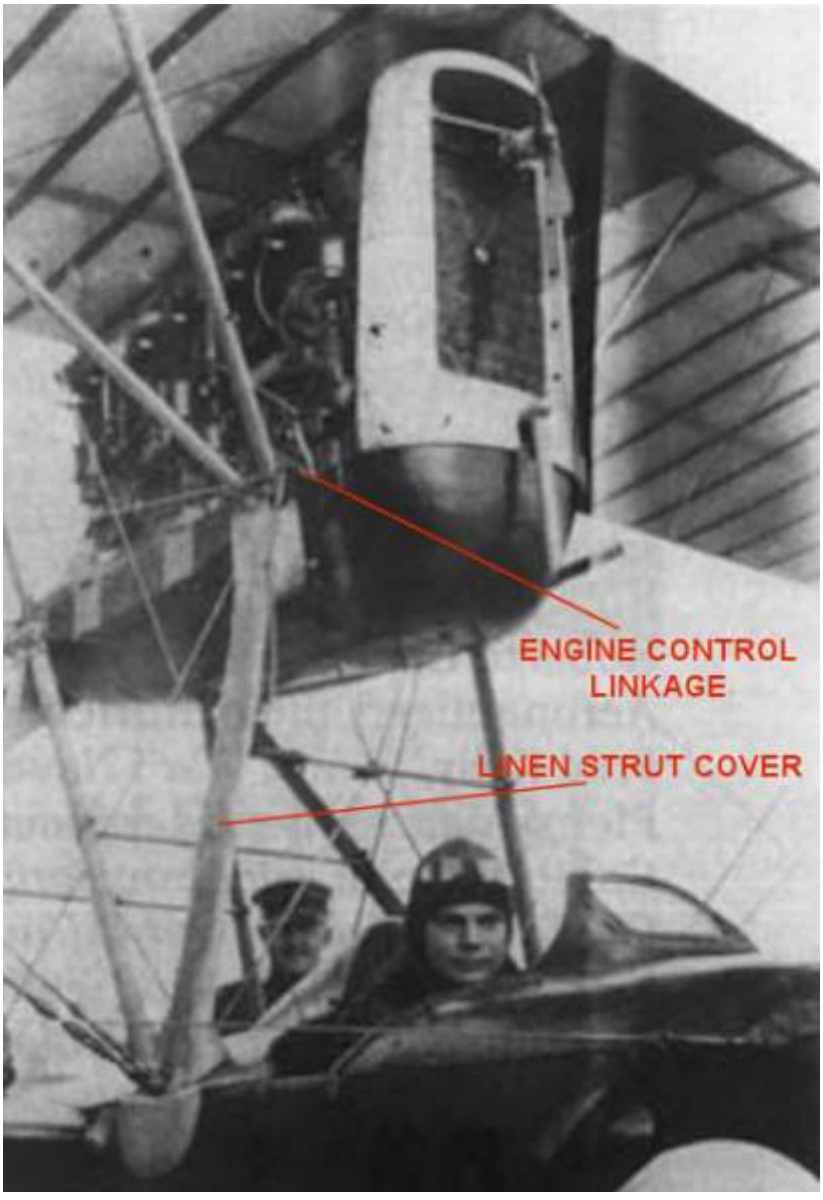
Secure all three rods in position.

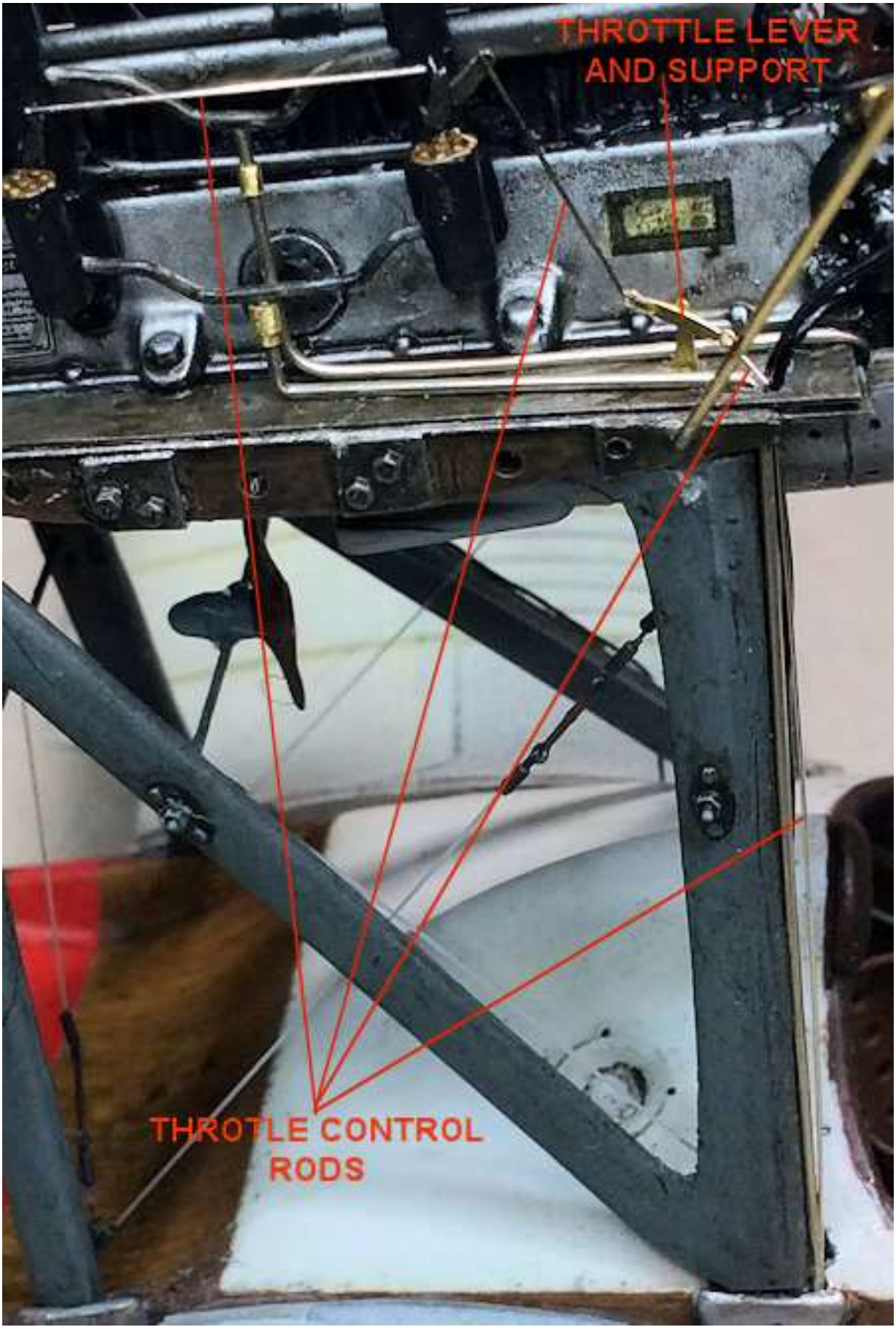
Cut a length of 0.2 mm diameter Nickel-Silver rod (e.g. 'Albion Alloy's' NSR02 or similar) long enough the fit between the underside of the hole in the engine bearer plate and the bottom of the right, forward engine support 'Z' strut.

Secure the rod in position.




MAGNETO
CONTROL ROD TO
CARBURETTORS
SPARK ADVANCE
CONTROL ROD
CONNECTION FROM
COCKPIT CONTROL ROD


ENGINE CONTROL
LINKAGE
LINEN STRUT COVER



Brush paint the photo-etch control horn and turnbuckle with ‘Mr. Colour’ Iron (212).

Retaining strips:

The various control rods and pies on the leading edge of the right, forward engine support ‘Z’ strut would normally have protected under a linen cover (not shown on this model). They would also have been held onto the strut, most probably with retaining strips.

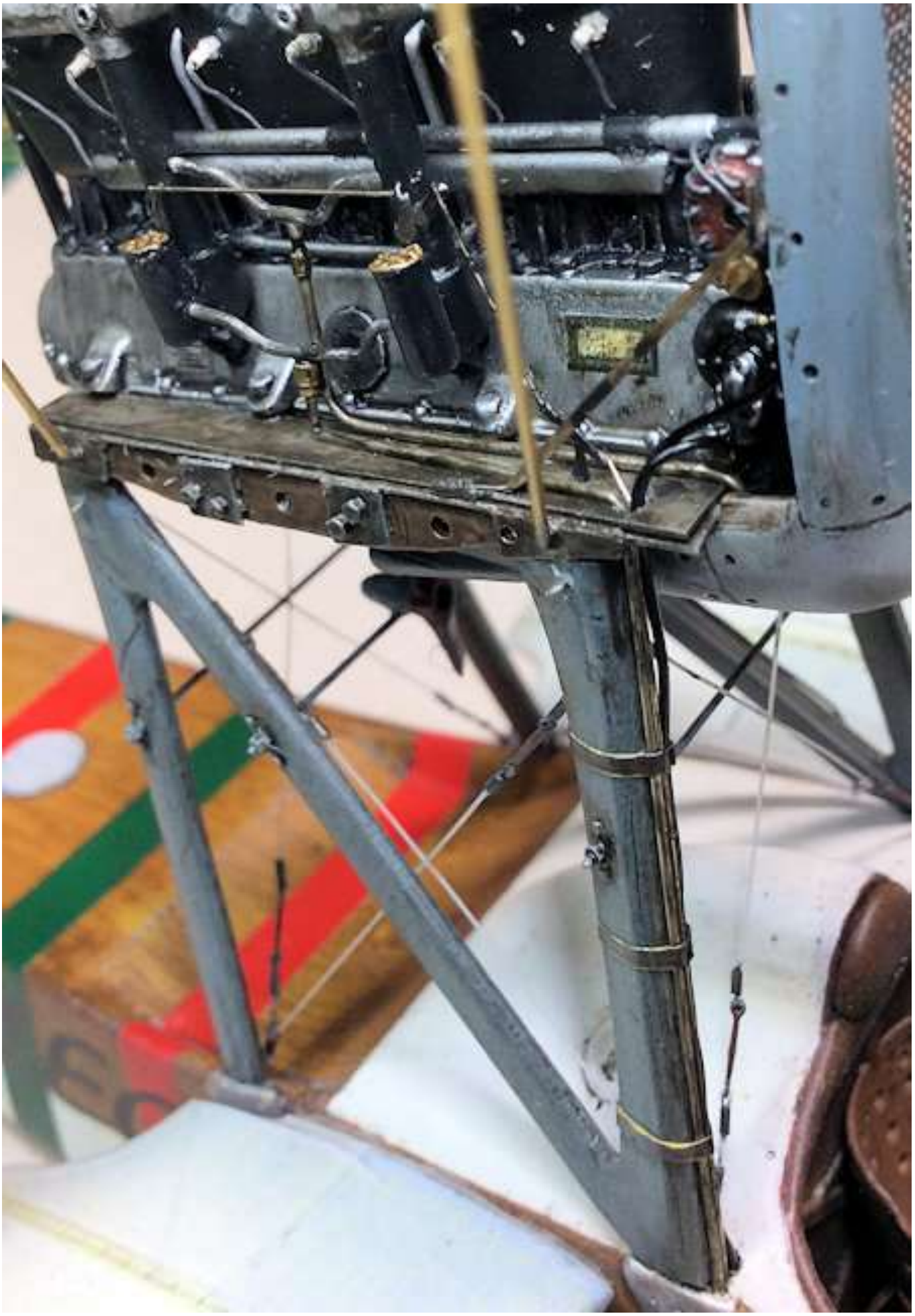
Cut three strips of 1.0 mm wide ‘Mr. Hobby’ Fine Masking Sheet (GT53:480).

Wrap the strips, equally spaced and around the right, forward engine support ‘Z’ strut to act as retaining strips holding the various controls to the strut.

Finish:

Airbrush a light coat of semi-matte sealer (e.g. ‘Alclad’ Light Sheen (311) or similar) over the strut, retaining strips and controls, including the added controls on the engine itself.

Carefully brush paint the three retaining strips with ’Mr. Colour’ Stainless Steel or similar.



Upper wing - final test fit:

Before pre-rigging, final test fit the upper wing onto all of the struts. Make sure all struts are fully seated into their location holes. Also that wings are aligned when viewed from above and from the sides.

Pre-rigging:

NOTE: *At this stage the model should be pre-rigged to make it easier to add the various rigging lines between the fixed wings. For rigging the control lines (ailerons, rudder and elevators) I use 'Stroft GTM' Silicon-PTFE tempered monofil (0.08mm) and for flying, landing and cross bracing I use 'Steelon' Mono-Filament 0.12mm diameter. Always cut the lines much longer than needed as it makes it easier to rig on the model.*

Rigging consists of using the appropriate line, micro-tube and 1:48th scale turnbuckles from 'GasPatch. Basically the line is passed through a short length of either 0.5 mm diameter tube (for flying, landing and cross bracing) or 0.4 mm line (for control lines) then through the 'eye' end of the either a turnbuckle or anchor point. The line is then looped back through the tube, which is then slid close to, but not touching, the turnbuckle/anchor 'eye' end and secure in position using thin CA adhesive. Before assembly of the model, only one end of a line is attached and the other end attached to a turnbuckle/anchor after which the line can be tightened. In this way the rigging can be tightened and aligned correctly. Always prepare each line with much more line than required as this aids in final rigging. Always use a sharp straight edged scalpel blade for 'roll' cutting tube and a shield razor blade for cutting line. When cutting line, angle the end cut, which helps the line to feed through the tubes.

Example of a prepared cable or line
(turnbuckle 'GasPatch' turnbuckle Type A with an Anchor point attached)

Example of a prepared cable or line
(turnbuckle 'GasPatch' turnbuckle Type C)

Check the rigging location holes pre-drilled in Part 7 (Preparation with Modifications) of this build log. If necessary, drill out any built up paint or decal.

Prepare twelve ‘GasPatch’ 1:48th scale Anchor Points.

Secure an anchor point (each side of the fuselage and wings), using thin CA adhesive, into each of the following rigging points:

Two at the base of the forward strut of the engine support ‘Z’ struts.

One inboard from the front strut location of the wing support ‘V’ strut on the underside of the upper wing.

One inboard from the rear strut location of the wing support ‘V’ strut on the underside of the upper wing.

Two inboard from the wing support ‘V’ strut locations on the lower wing.

Upper wing:

NOTE: *Pre-rigging needs to be added to each of the anchors inboard from the wing support ‘V’ struts on the underside of the upper wing.*

Cut four long lengths of 0.12 mm diameter ‘Steelon’ Mono-Filament.

Roll cut four short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass the lines through the cut tubes then through the ‘eye’ ends of the anchor points.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the eye ends of the anchors.

Secure in position using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the lines.

Ailerons:

NOTE: *Pre-rigging needs to be added to each end of the four aileron control horns.*

Cut four long lengths of 0.12 mm diameter ‘Steelon’ Mono-Filament.

Roll cut four short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass the lines through the cut tubes then through the holes in the end of the four control horns.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the control horns.

Secure in position using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the lines.

Ailerons control lines:

NOTE: *These two control lines do not require anchor points or turnbuckles.*

Cut two long lengths of 0.12 mm diameter ‘Steelon’ Mono-Filament.

Secure one end of each line into the pre-drilled holes at the inboard aileron inspection panels on the underside of the upper wing.

Engine support ‘Z’ struts:

NOTE: *Pre-rigging, with a turnbuckle attached, needs to be added to each of the anchors already added to the tops of the forward and rear struts of the engine support ‘Z’ struts.*

Cut two long lengths of 0.12 mm diameter ‘Steelon’ Mono-Filament.

Roll cut two short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass each of the lines through a cut tube then through one ‘eye’ end of a ‘Gaspatch’ turnbuckle (Type C).

Loop the lines back through the tubes and slide the tubes up to, but not touching, the eye ends of the turnbuckle.

Secure in position using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the lines.

Roll cut a short length of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass one of the lines through the cut tube then through the ‘eye’ ends of an anchor point already fitted to the top of the engine support ‘Z’ struts.

NOTE: *During the next step the distance between the ‘eye’ ends of the turnbuckle and the anchor point should be approximately 6 mm.*

Loop the line back through the tube and slide the tube up to, but not touching, the eye end of the anchor.

Secure in position using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the line.

Repeat this procedure to create a turnbuckle line attached to the four strut anchor points.

Brush paint all wing and engine support ‘Z’ strut turnbuckles and tubes with ‘Mr. Colour’ Iron (219) or similar.

Brush paint the centre barrel of all turnbuckles with ‘Tamiya’ Hull Red (XF9), thinned with X20A.

Ailerons to upper wing - fit:

NOTE: *When fitting the ailerons to the wing, make sure the pre-rigged control cables are not trapped between the trailing edge of the wing and leading edge of the ailerons.*

Locate the two ailerons onto their location pins. Don’t push them fully on.

Apply CA adhesive to the exposed locating pins.

Push the ailerons fully onto the locating pins.

Cut the control lines just past the pre-drilled holes in the top and underside of the wing.

Insert the lines into the holes, keeping them taut, secure in the holes using thin CA adhesive.

Upper wing - fit:

Use small pieces of masking tape to temporarily stick the two aileron control lines onto the wing to keep them away from the wing strut locations.

Locate the front and rear aerofoil sections (for the upper wing support ‘Z’ struts) onto their installed support rods. Do not secure at this stage.

Apply CA adhesive to the lower locating pins of the wing support ’V’ struts.

Position the upper wing and carefully locate the wing support ’V’ struts into their location holes on the lower wings.

Hold the model and carefully turn the model upside down, holding the upper wing steady.

Locate the four upper wing support ‘Z’ struts into their locating holes pre-drilled into the underside of the wing.

Apply CA adhesive to secure the four locating pins of the struts into the wing.

Locate the two cross struts of the upper wing support ‘Z’ struts into their locating holes pre-drilled into the underside of the wing and the engine support frame.

Apply CA adhesive to secure the two locating pins of the struts into the wing.

Apply CA adhesive to secure the bottom of the six struts to the engine support frame.

Remove the masking tape holding the aileron control lines.

Once the upper wing joints have set fully, check for and gaps between the aerofoil sections and the underside of the upper wing. If there are gaps they can be filled with a thicker, slow action CA adhesive or standard CA adhesive mixed with a small amount of talcum power or similar.

Touch up any scuffed or chipped paint on the struts by brush ‘Tamiya’ Ocean Grey (XF82), the when dry, lightly airbrush with a semi-matte sealer (‘Alclad’ Light Sheen (ALC311 or similar). Once the sealing coat is dry, weather as before then re-seal.

Tail unit - fit:

NOTE: *Before completing the wing rigging, the tail unit (fin/rudder and elevators) can be fitted.*

Locate the fin/rudder assembly locating pins into the pre-drilled holes in the tail plane/elevator assembly.

Slide the created twin rudder control horn onto the added rudder post.

Apply CA adhesive onto the top of the fuselage fin support fairing.

Locate the tail unit assembly onto the fin support fairing and position the win rudder horn against the pre-cut slot in the rear edge of the fuselage.

Make sure The fin/rudder is vertical to the fuselage and the tail plane/elevator is horizontal to the fuselage.

Apply CA adhesive down the rudder post and around the twin rudder horn to secure them to the rear edge of the fuselage.

Rigging the wings:

Engine bearers anchors to lower wing:

Roll cut four short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass each of the four lines through the cut tubes then through the ‘eye’ ends of the anchor points inboard from the bottom of the wing support ‘V’ struts.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the eye ends of the anchors. At this stage do not secure the lines and leave the lines slack.

Fuselage anchors to upper wing:

Roll cut four short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass each of the four lines through the cut tubes then through the ‘eye’ ends of the anchor points on the fuselage at the bottom of the forward engine support ‘Z’ struts.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the eye ends of the anchors. At this stage do not secure the lines and leave the lines slack.

Fuselage to ‘V’ strut base of lower wings:

Cut two long lengths of 0.12 mm diameter ‘Steelon’ Mono-Filament.

Roll cut two short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Prepare two ‘Gaspatch’ turnbuckles (Type ‘One End’).

Pass each of the lines through the cut tubes then through the ‘eye’ ends of the turnbuckle.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the eye ends of the turnbuckles. At this stage do not secure the lines and leave the lines slack.

Drill a hole of 0.3 mm diameter, aligned to the turnbuckle in the fuselage, into the dome at the base of the ‘V’ struts on the lower wings.

Secure the free ends of each lines to and anchor point and tube and secure the anchor into the pre-drilled holes in the dome on the lower wings. Cut away the exposed excess line.

Secure the tang of the turnbuckles into the pre-drilled holes at the forward, top of the fuselage sides. Make sure the turnbuckles are angled correctly towards the domes on the lower wings.

Line tightening:

For each of the ten install lines, carefully pull on the exposed end of the lines to tighten the lines and at the same time, move the tubes up to, but not touching, the anchors points.

Secure the tubes in position on the lines using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the lines.

Finish:

Brush paint all turnbuckles and tubes with ‘Mr. Colour’ Iron (219) or similar and the centre barrel of all turnbuckles with ‘Tamiya’ Hull Red (XF9), thinned with X20A.

Lightly airbrush the rigging with a semi-matte sealer (e.g. ‘Alclad’ Light Sheen ALC311 or similar.

Aileron cockpit control lines:

Make sure the two control line access holes pre-drilled through the cockpit rear decking into the cockpit are clear. If necessary, open up the holes using a 0.4 mm diameter drill.

Pass each line through its access hole then out over the edge of the cockpit.

Apply slight tension to the lines by holding them to the fuselage sides with masking tape. Do not apply too much tension or the lines may pull out of the upper wing location holes.

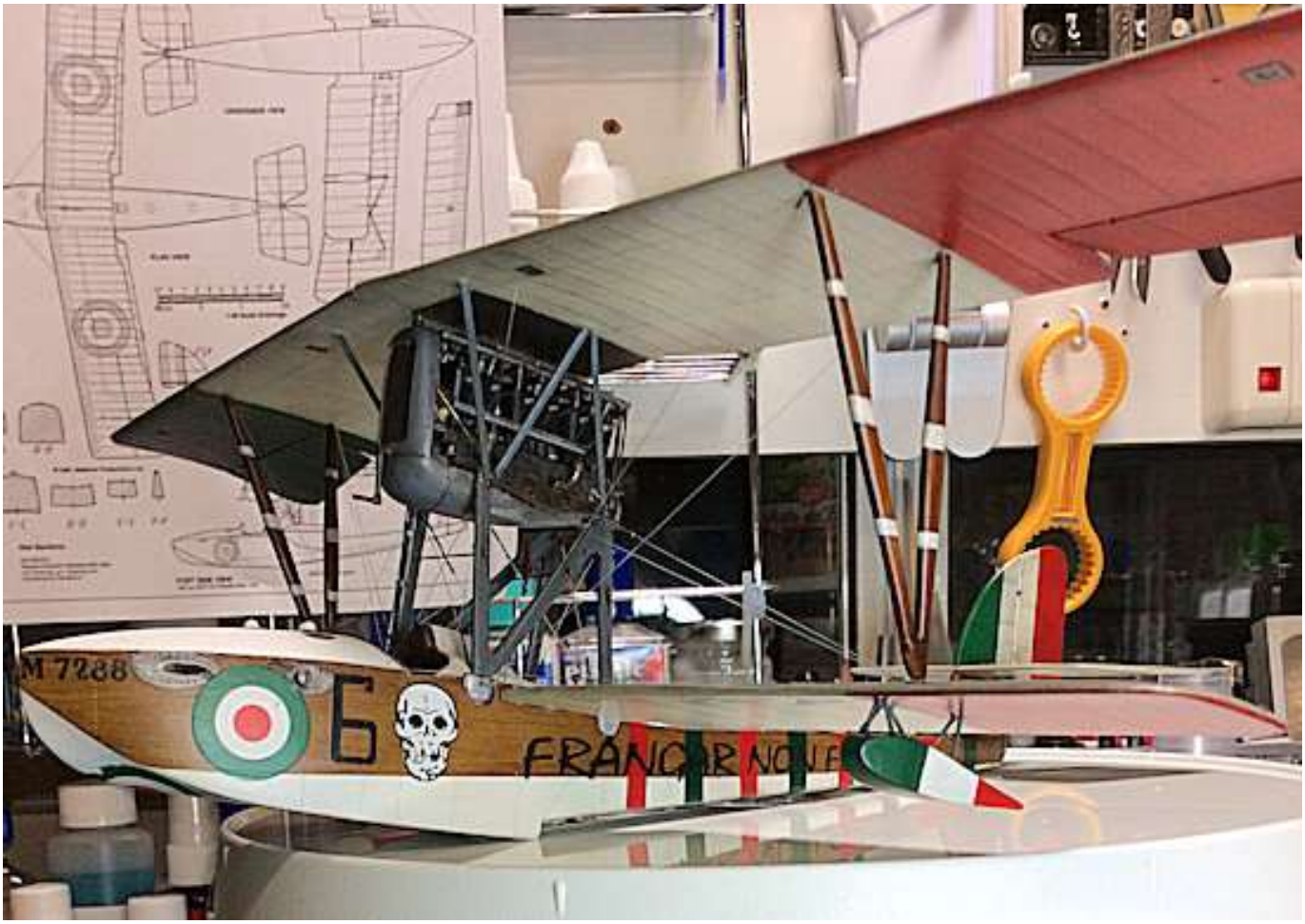
Apply thin CA adhesive to the line access holes.

Once the adhesive has set, remove the masking tape.

Keeping the lines at the same angle, route the ends of the lines diagonally down and behind the pilot’s seat.

Wing floats:

Using CA adhesive, secure the two wing floats into the prepared recesses on the underside of the lower wings.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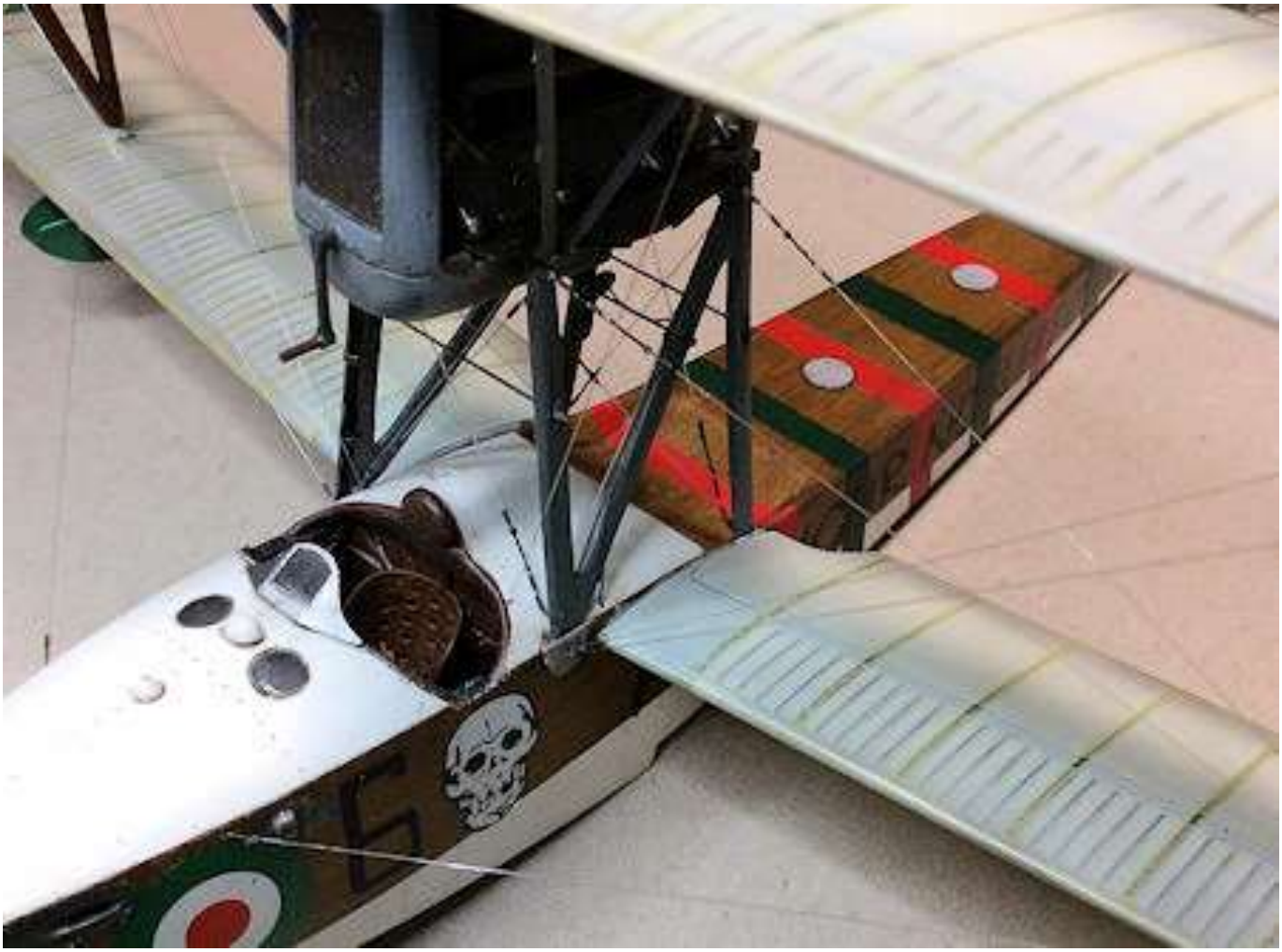
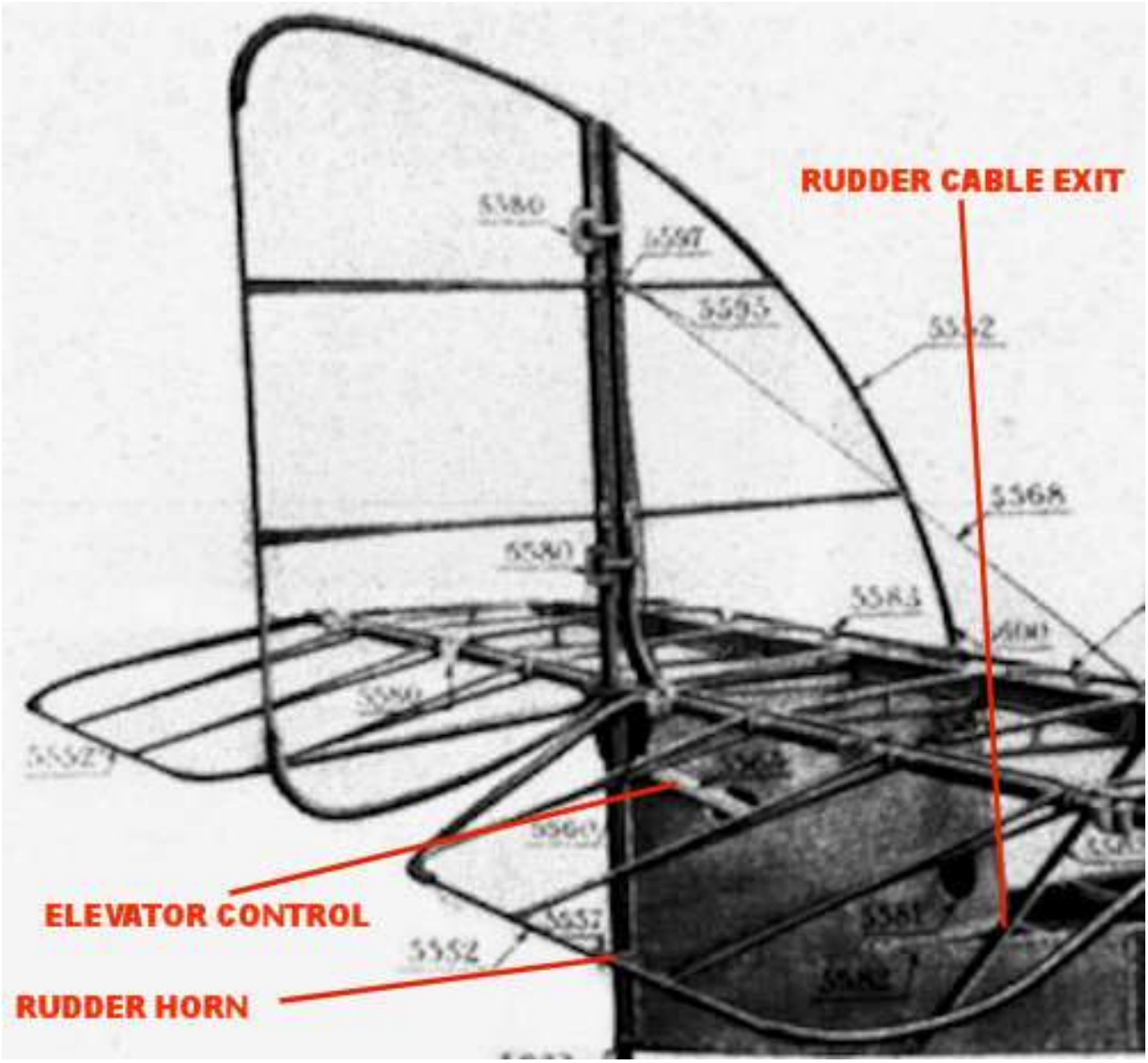


Tail unit - rigging and bracing:

The rudder was controlled by lines from the top, rear of the fuselage to control horns, located on the rudder post.

The elevator was controlled by rods from the aperture in the fin support fairing to the elevator horns.

The top of the tail plane was braced by wires from the fin, but the underside was braced by struts from the rear of the fuselage.



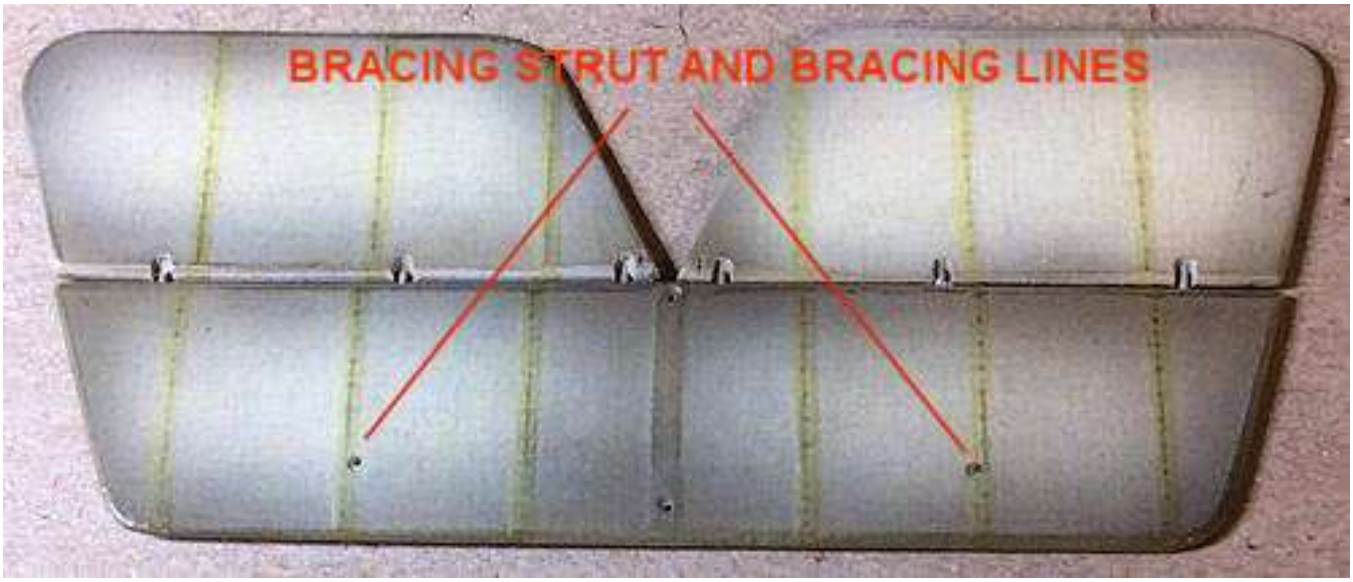
Bracing struts:

Cut two lengths of 0.9 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT09 or similar), long enough to span between the pre-drilled holes in the bottom edge of the fuselage rear and the pre-drilled holes in the underside of the tail plane.

Cut four short lengths of 0.5 mm diameter rod (e.g. ‘Albion Alloy’s’ MBR05 or similar).

Using the ‘Albion Alloy’s’ ‘Strutter’ tool form aerofoil sections.

Drill a hole into, but not through, through the tail plane at each side (see photo below) of 0.5 mm diameter.



Drill a hole of 0.6 mm diameter into the bottom edge at the rear of the fuselage.

File the ends and length of each section so that they rest against the pre-drilled holes in the fuselage and tail plane.

Secure the cut 0.5 mm rods into the ends of the section. I used soft solder, but CA adhesive can be used as an alternative.

Cut and bend the protruding rods so that the section locate into the pre-drilled holes.

Brush paint the ends of the sections using ‘Tamiya’ Ocean Grey (XF82).

Secure the struts into the fuselage and tail plane holes, using CA adhesive.

Brush paint the remainder of the struts using ‘Tamiya’ Ocean Grey (XF82).

Elevator control rods:

Cut two short lengths of 0.5 mm diameter tube (e.g. ‘Albion Alloy’s’ Aluminium (MAT05 or similar).

Flatten the tubes using flat nose pliers.

Cut the length of each tube so that it can rest against the inside of the elevator control horns and also be inserted into the aperture created in the fin support fairing.

Secure the flat control rods onto the elevator control horns and inside the aperture, using CA adhesive.

Rudder control lines:

Cut two long lengths of ’Steelon’ 0.12 mm diameter mono-filament.

Roll cut two short lengths of 0.5 mm diameter tube (’Albion Alloy’s’ Aluminium MAT05 or similar).

Pass each of the lines through a cut tube then through the holes in the ends of the rudder control horns.

Loop the lines back through the tubes and slide the tubes up to, but not touching, the control horns. At this stage do not secure the lines and leave the lines slack.

Pass the lines under the installed bracing struts to the pre-drilled holes at the top, rear of the fuselage, forward from the fin support fairing.

Secure the end of the lines into their fuselage hole, using thin CA adhesive.

For each of the lines, carefully pull on the exposed end of the lines to tighten the lines and at the same time, move the tubes up to, but not touching, the anchors points.

Secure the tubes in position on the lines using thin CA adhesive.

Carefully cut away the exposed ’tag’ of the lines.

Tail plane bracing line:

Cut a long length of ’Steelon’ 0.12 mm diameter mono-filament.

Roll cut four short lengths of 0.4 mm diameter tube (’Albion Alloy’s’ Nickel-Silver NST04 or similar).

Drill a hole of 0.4 mm diameter through the tail plane just outboard from the location of the support struts.

Pass the line trough the pre-drilled hole at the top of the fin.

Slide two cut tubes onto each side of the line.

Pass the ends of the line down through the drilled holes.

Secure one end of the line in its hole using thin CA adhesive.

Gently pull on the other end of the line to tension it. I hung a self gripping tweezer on the line.

Secure that end of the line in its hole using thin CA adhesive.

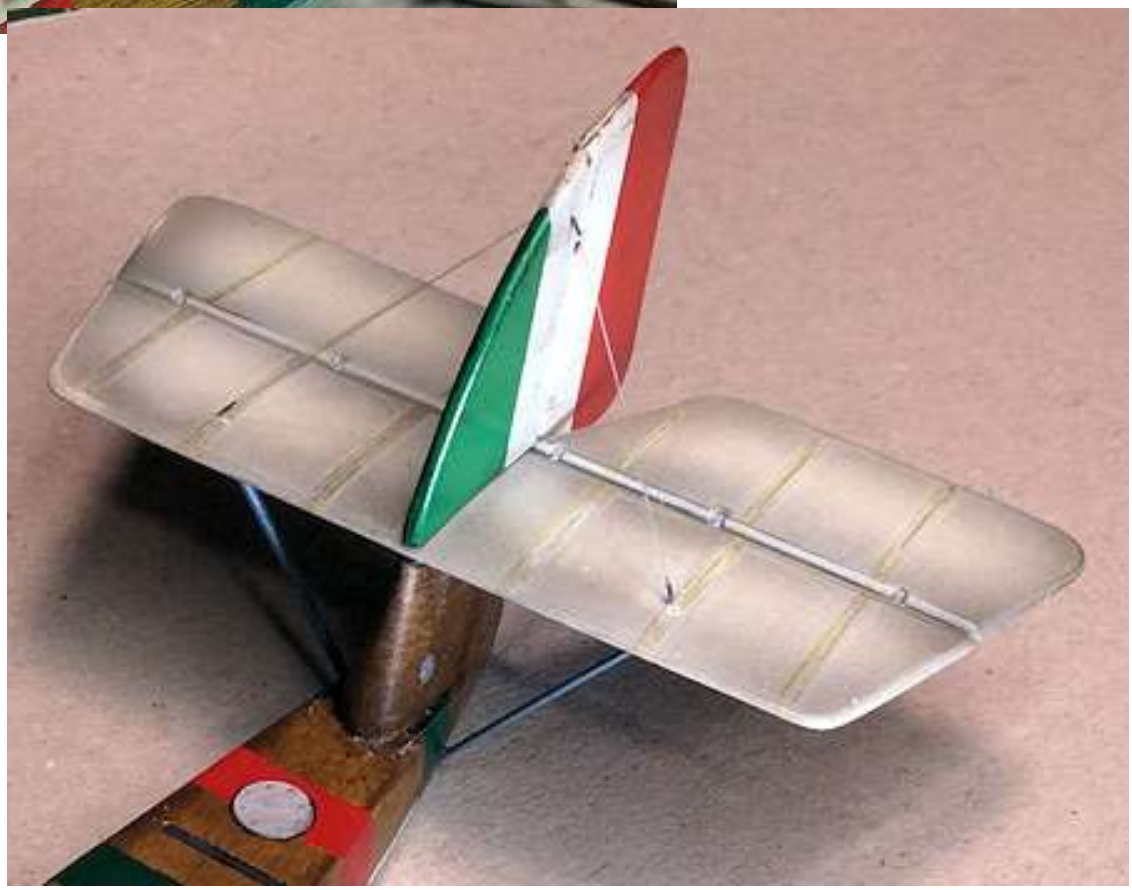
Secure the four tubes to the line. Position one on the top of the tail plane at each side and the remaining two tubes up against the fin.

From under the tail plane, carefully trim away the exposed line ‘tags’.

Finish:

Brush paint all tubes with ‘Mr. Colour’ Iron (219) or similar.

Lightly airbrush the rigging with a semi-matte sealer (e.g. ‘Alclad’ Light Sheen ALC311 or similar).



Additional support strut attachments:

NOTE: *The following addition struts are not supplied with the kit and will need to be created from scratch.*

The upper and lower wings were additionally braced by a ’V’ strut. The strut was fitted at each side, between the ‘V’ strut attachments on the lower wing and the outboard underside of the upper wing. The struts had a cross bar fitted between the ’V’ struts. Two struts connected the cross bar to the top of the wing ‘V’ struts.

NOTE: *The additional struts could not be created until the upper and lower wings have been fitted, otherwise accurate cutting of the tubing used can’t be guaranteed.*

Cut four lengths of 0.9 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT09 or similar) slightly longer than needed to span between the lower wing pre-drilled location holes outboard from the bottom of the wing support ‘V’ strut and the two pre-drilled holes in the underside of the upper wing.

Slide each tube onto a length of 0.5 mm diameter rod (e.g. ‘Albion Alloy’s’ MBR05 or similar) and using the ‘Strutter’ tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil tubes.

Cut eight short lengths of 0.5 mm diameter rod (e.g. ‘Albion Alloy’s’ MBR05 or similar).

Insert a cut rod into one end of each aerofoil sections and secure in position. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

Working with each aerofoil section at a time, insert the location rod into its location hole outboard from the bottom of the wing support ‘V’. From the other end carefully reduce the length of the aerofoil section until it aligns with its pre-drilled hole in the underside of the upper wing.

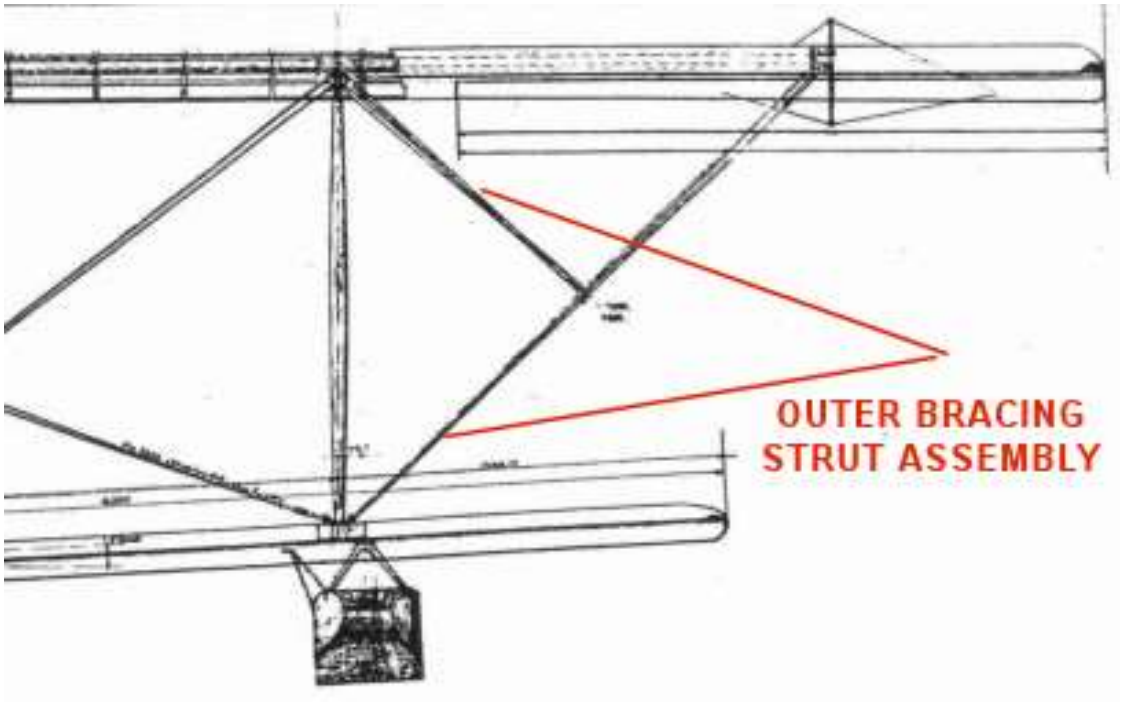
Insert a cut rod into the top end each aerofoil sections and secure in position. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

NOTE: *During the following step, don’t try to force the struts into position or the existing wing strut joints may separate. Also the struts may bow if forced into position.*

Working with each aerofoil section at a time, carefully bend the top rods so the strut can be located into its top and bottom locating holes with the ends of the struts just in contact with the model surfaces.


PAINT
RETARDER

NOTE: *In the following illustration, note the angle made by the struts between the tops of the wing support 'V' struts to the outer bracing struts. The struts are attached to the midway point of the outer bracing struts.*



Carefully remove the outer bracing struts from between the wings.

On the inboard side of each strut, mark the centre of the strut.

At the marks drill a hole of 0.6 mm diameter, **but only through the inboard side** (not all the way through the tube).

Refit the outer bracing struts between the wings.

Cut four lengths of 0.9 mm diameter tube (e.g. 'Albion Alloy's' MBT09 or similar) slightly longer than needed to span between the tops of the wing support 'V' struts to midway on the outer bracing struts.

Slide each tube onto a length of 0.5 mm diameter rod (e.g. 'Albion Alloy's' MBR05 or similar) and using the 'Strutter' tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil tubes.

Cut eight short lengths of 0.5 mm diameter rod (e.g. 'Albion Alloy's' MBR05 or similar).

Insert a cut rod into one end of each aerofoil sections and secure in position. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

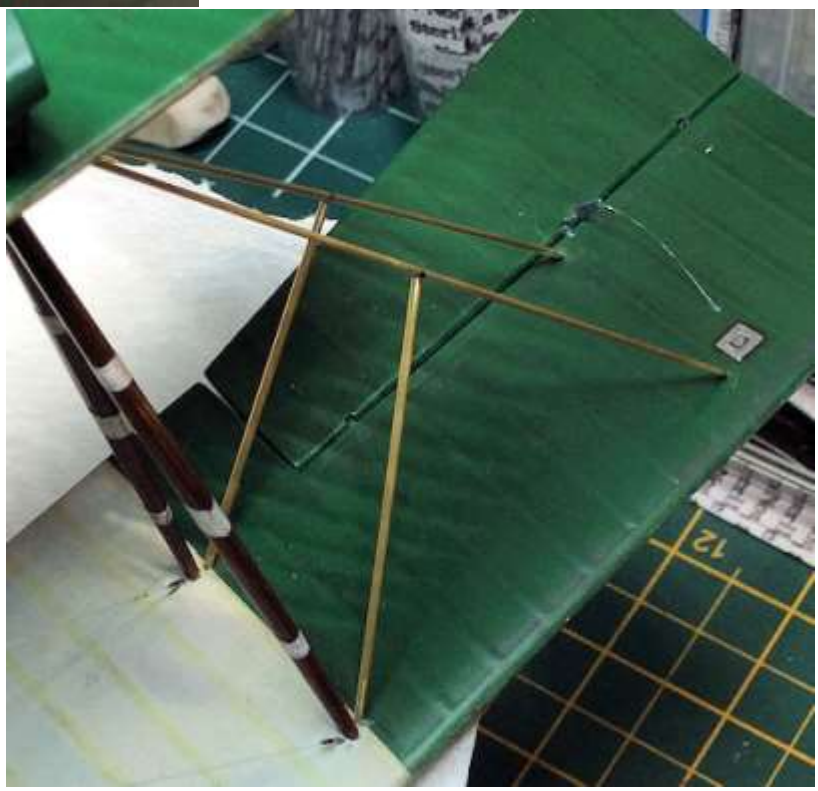
NOTE: *During the following step, don't try to force the struts into position or the existing wing strut joints may separate. Also the outer bracing struts may bow if the struts are forced into position.*

Working with each aerofoil section at a time, insert the location rod into its pre-drilled location hole just outboard from the tops of the wing support 'V' struts. From the other end carefully reduce the length of the aerofoil section until it just touches the midway point (at the pre-drilled hole) of its associated outer bracing strut.

Insert a cut rod into the open end each aerofoil sections and secure in position. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

Test fit each strut in position by inserting the locating rod of the strut into its locating hole, outboard from the tops of the wing support ‘V’ struts and the opposite end locating rod into the pre-drilled hole in the associated outer bracing strut.

Make sure the struts are fully located and with no gaps at the end locations. Also make sure the outer bracing struts are not bowed.



Brush paint the ends of the sections using ‘Tamiya’ Ocean Grey (XF82).

Secure the struts into position between the wings, using CA adhesive.

Cut two lengths of 0.9 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT09 or similar) slightly longer than needed to span between the two long struts at the junction of the two inner struts bracing struts.

Slide each tube onto a length of 0.5 mm diameter rod (e.g. ‘Albion Alloy’s’ MBR05 or similar) and using the ‘Strutter’ tool, create two aerofoil sections.

Remove the 0.5 mm rod from the aerofoil tubes.

File the ends of the two struts so that they fit between the long struts, but without pushing on the struts.

NOTE: *Although it can form a strong joint, CA adhesive joints can break if the components are subjected to stress or flexing. The outer bracing strut assembly may flex when the model is handled or transported, so additional adhesive should be used for these two struts. Although not fitted to this strut on the actual aircraft, an addition rod was added to help hold this strut in position.*

Cut two lengths of 0.5 mm diameter rod (e.g. ‘Albion Alloy’s’ MBR05 or similar) so they span the outboard edge of the long struts.

Mix and apply a small amount of two part epoxy adhesive (e.g. ‘Araldite Rapid’ or similar) along the outboard sides of the struts.

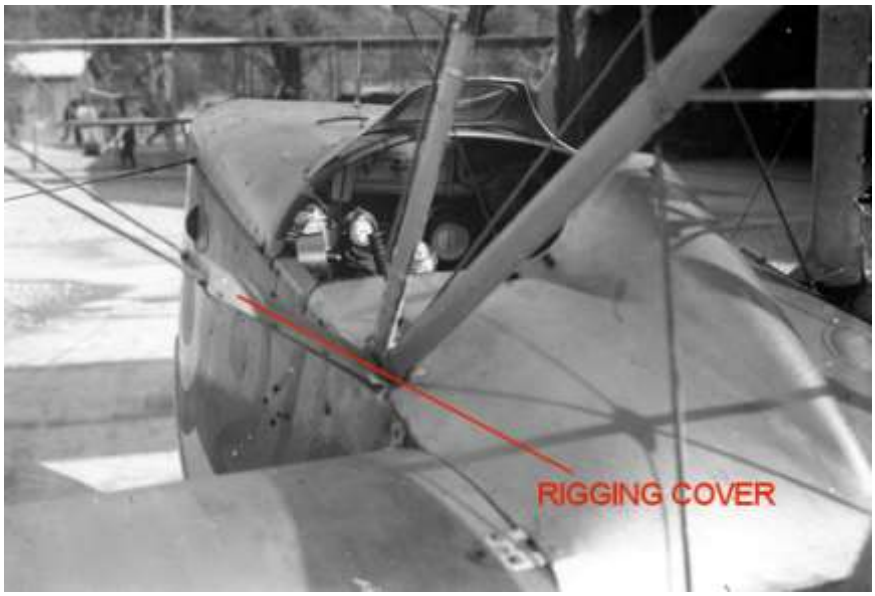
Once the adhesive has set, secure the struts into position between the long struts, using two part epoxy adhesive (e.g. ‘Araldite Rapid’ or similar). The added 0.5 mm diameter rod needs to be on the outboard sides of the long struts.

Brush paint the remainder of the struts using ‘Tamiya’ Ocean Grey (XF82).

Lightly airbrush the struts with a semi-matte sealer (e.g. ‘Alclad’ Light Sheen ALC311 or similar).

Rigging covers:

Twin rigging wires were fitted between the bottom of the forward engine support struts and the top of the wing 'V' support struts. The adjustable turnbuckles for these wires were protected at the forward engine support struts by covers, which are fastened at the trailing edge. As they must have been removable for adjustments to the rigging, I've assumed they were doped linen or canvas. These covers are represented in the kit as parts 34. However only one part 34 was supplied in my kit, therefore I chose instead to make both covers.



Separate a standard (not embossed) 'Kleenex' tissue layer.

Cut two pieces to shape around the two rigging lines, on each side of the fuselage.

Mix water with PVA adhesive (white glue) to 50-50 % ratio.

Apply a small amount to the rigging lines where the cover will be located.

Lay the tissue shapes on a flat surface with water/PVA solution applied.

Carefully lift the soaked tissues off and position onto the rigging lines.

Use a brush soaked in the mixture to fold the tissue around the lines.

Leave the tissue to fully dry.

To harden the tissues for painting, carefully brush over neat PVA adhesive.

Leave the adhesive to fully dry.

Brush grey primer over the tissue covers.

Brush paint the covers with 'Tamiya' Ocean Grey (XF82).

Wing vent pipe

Some photographs of the Macchi M.5 show what appears to be a vent pipe, located centrally at the leading edge of the upper wing and above the engine radiator. My assumption is that when required, this pipe vents excess pressure from the engine radiator prevention damage due to over pressurization of the coolant.

Cut a length of 0.5 mm Nickel-Silver tube (E.G. ‘Albion Alloy’s’ NST05 or similar).

Drill a 0.7 mm diameter hole into the top of the upper wing and aligned with the radiator cap.

Bend the tube as shown in the following photograph.

Secure the tube into the hole, using CA adhesive.

Brush paint the vent pipe with ‘Mr. Colour’ Iron (212).

Propeller - fit:

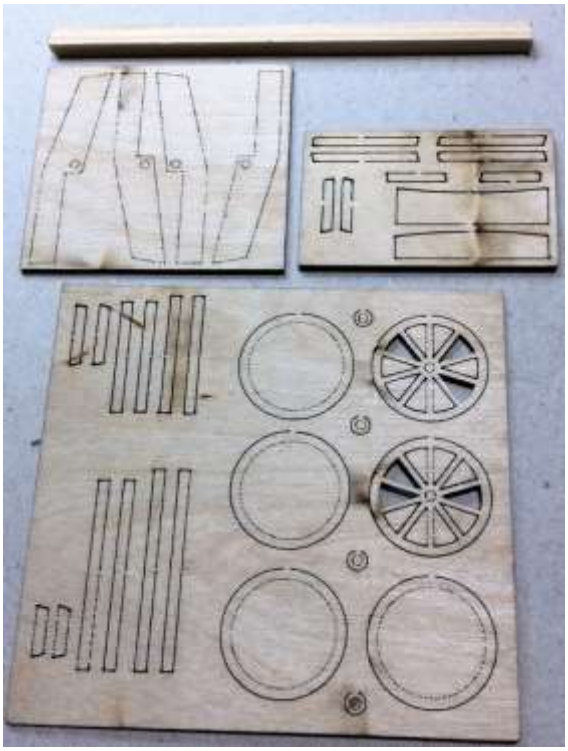
Apply CA adhesive to the propeller shaft and insert it into the pre-drilled hole in the rear of the engine.

PART 11

BEACHING TROLLEY AND TRESTLES

PART 11 - BEACHING TROLLEY AND TRESTLES

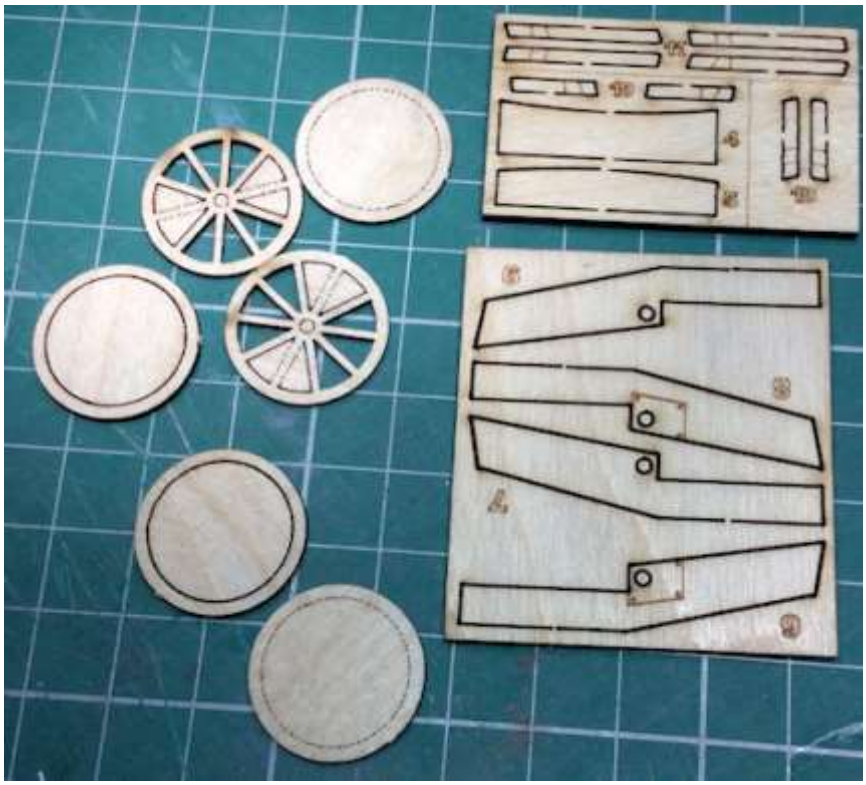
The beaching trolley and support trestles for this aircraft are supplied in kit, in the form of laser cut wood. Some parts are supplied on the kit supplied photo-etch sheet.



NOTE 1: *You may find that the photo-etch metal rims supplied for the wheels of the beaching trolley (PE 1) are not long enough to join at the ends. If this is the case, position the ends so they are on the bottom of the wheels.*

NOTE 2: *The axle for the beaching trolley must be created from 2 mm diameter rod, length 4 mm long.*

NOTE 3: *I found that some of the wood parts had not been laser cut through, therefore the segments not required needed to be cut through on the dotted laser marks of the rear face.*

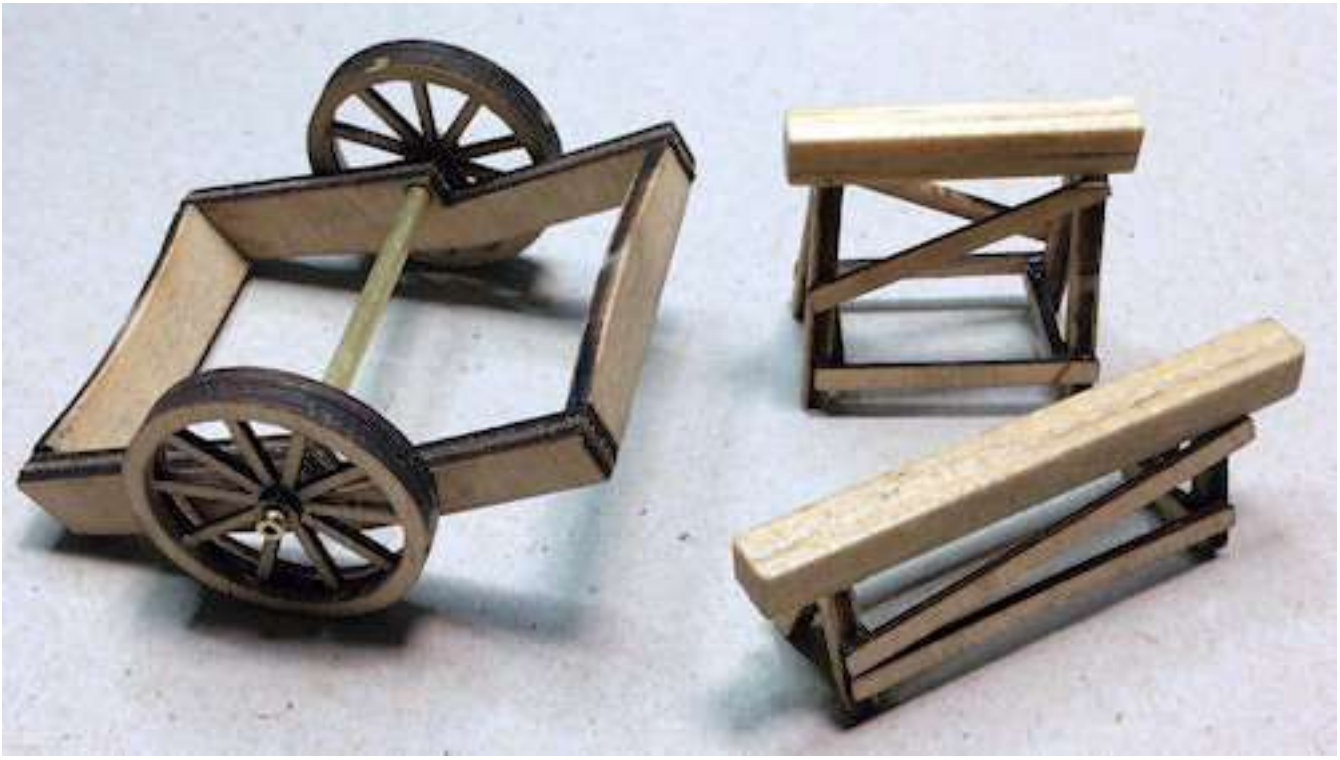


Follow the kit instruction manual to build the beaching trolley and trestles.

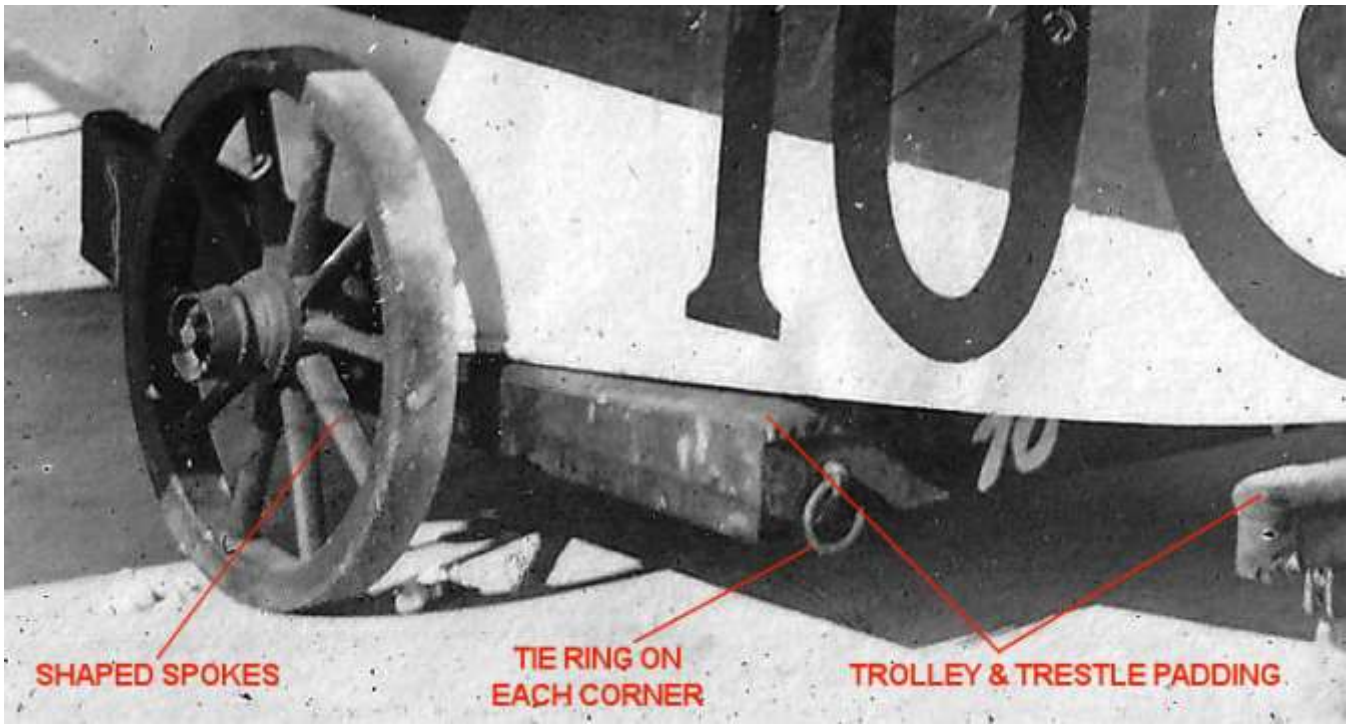
Use 2.0 mm diameter tube 44 mm long to create the axle for the beaching trolley.

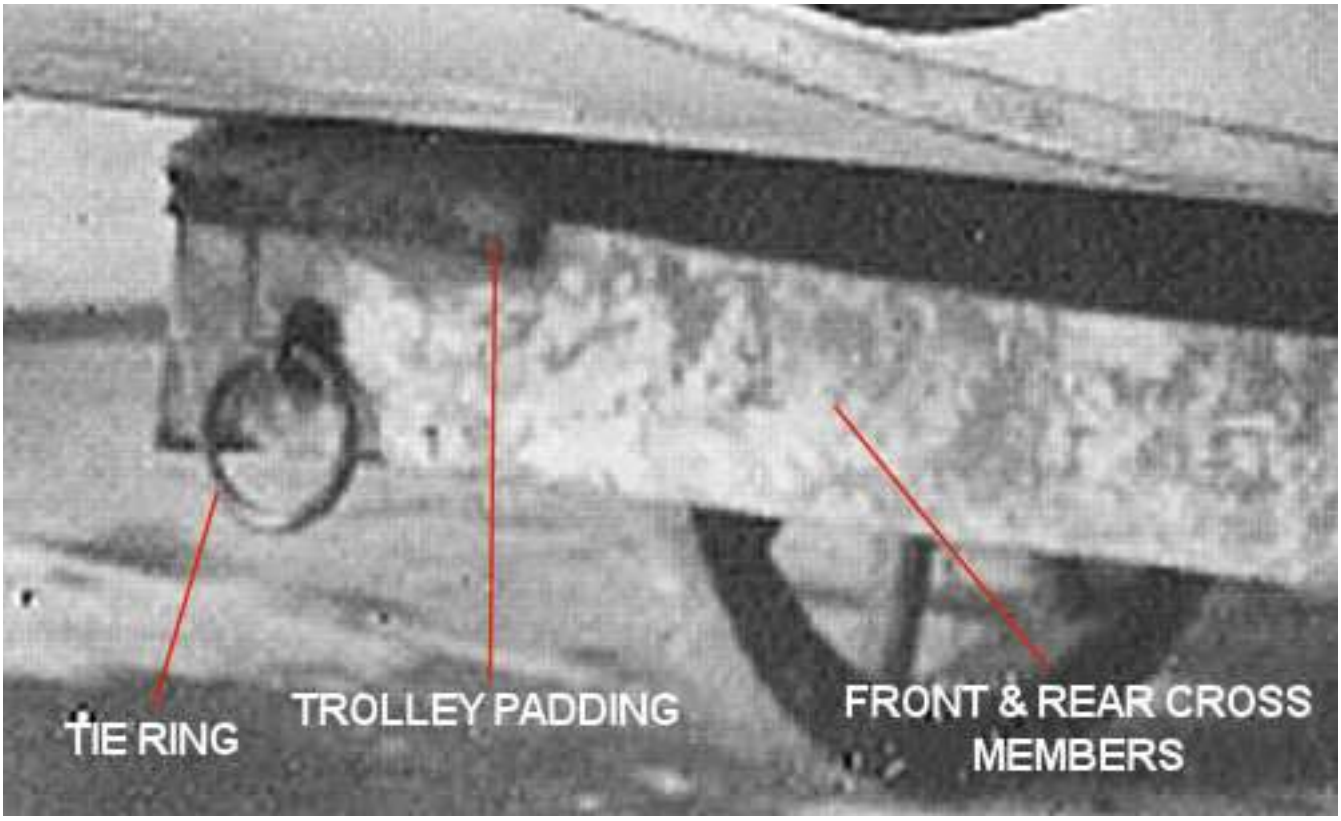
Use CA adhesive or PVA adhesive to secure the various laser cut wooden parts.

Do not secure the wheels to the axle or the axle to the beaching trolley at this stage.



As can be seen in the following photographs, the spokes of the wheels on the beaching trolley had an aerofoil shape, not as on the basic kit spokes. Also the photographs show that padding was fitted to the top of the side members on the beaching trolley and also on the top member of the trestles. This was done to protect the underside of the aircrafts hull from damage. Finally the 'tie rings' were fitted to the corners of the front and rear cross members of the beaching trolley.





NOTE: *Due to the nature of the laser cut wood used and the restricted access to the wheel spokes, it's not really possible to shape the entire cross section of each spoke.*

Using a sharp, curve edged blade or similar, carefully scrape away the edges of the wheel spokes to create more rounded edges, similar to those seen in the previous photographs.

Clean off any shards or tags of wood then brush paint the wheels, beaching trolley chassis, wheels and trestles with 'AK Interactive' enamel Wood wash (AK263).

NOTE:

The photo-etch parts supplied in the kit for the beaching trolley are:

Wheel rims (PE1 x 2) - you may find don't wrap completely around the wheel, leaving a gap. If so position the gap at the bottom of the wheel or fill the gap with modelling putty, then sand to blend with the photo-etch rims.

Axle plates (PE2 x 4) - these were not used as they are oversized and overhang the edges of the assembled beaching trolley.

Tie ring plates (PE32 x 4) - these are not numbered on the photo etch sheet.

Tie rings (PE27 x 4) - these were modified to better represent the actual rings.

Wheel hub flanges (PE12 x 4).

Cut away the required parts from the photo-etch sheet.

Cut away any photo-etch tags from the edges of the parts.

Using a heat source (e.g. cigarette lighter or similar) gently play the flame along the length of each wheel rim (PE1) to anneal the photo-etch making it easier to bend. Keep the flame moving until discolouration is seen along the part. This also creates a 'used' metal finish.

Very lightly scuff the contact sides of the photo-etch parts with a fine sander. This will aid in adhesion to the wood surfaces.

NOTE:

The tie rings (PE27) are flat and two-dimensional. The actual rings were of course made of round section metal.

Cut the 'rings' away from each part PE27.

Cut the length of the straight tang to approximately 0.5 mm.

Bend the straight tang at 90 degrees at the join of the larger square area.

Bend four lengths of 'PlusModel' 0.5 mm diameter lead wire around an armature with a diameter just over 2.0 mm, to form four rings.

Using thin CA adhesive, secure a ring onto a part PE32 (tie ring plate), central but below the centre hole. Repeat for the remaining three rings and plates.

Locate each tang of part 27 into the hole in the centre of the plates and secure to the top, front face of the ring using thin CA adhesive.

Brush paint the exposed sides of the tie ring plates with 'Mr. Colour' Stainless Steel (213).

Clean any wood wash from the metal axle (2.0 mm fitted rod).

Using fine sandpaper, lightly scuff the wood wash on the beaching trolley, wheels and trestles to represent wear of the treated wood surface.

Discard the kit supplied PE2 axle plate and instead, brush paint the axle plates on the beaching trolley with 'Mr. Colour' Stainless Steel (213).

To represent the protective padding fitted, brush paint 'Tamiya' Rubber Black (XF85) along the top of the side and cross members of the beaching trolley and the tops of the trestle beams. Also slightly overlap the paint along the inner and outer edges.

Beaching trolley - assembly:

Using two part epoxy adhesive (e.g. 'Araldite 5 minute), wipe a small amount onto the outer rim of the two wheels then locate a photo-etch rim (PE1) onto the adhesive. Make sure the photo-etch rim is central on the wheel and clamp it in position until the adhesive sets.

Slowly work around the wheel, adding adhesive and clamping until the photo-etch rim is secured around the whole wheel.

Slide the axle rod into the beaching trolley holes.

Centralise the axle so that the protruding axle ends measure the same at both sides.

Secure the axle in position applying thin CA adhesive to the axle and inside edges of the beaching trolley.

Locate a wheel hub flange (PE12) onto the protruding axle ends, followed by an inner spacer, the wheel, outer spacer and finally a second wheel hub flange.

Carefully push the parts together and centralise the assemblies on the protruding axle ends.

Carefully remove the outer wheel hub flanges, wheels and out spacers.

Secure the inner wheel hub flange and spacer in position on the axle with thin CA adhesive.

Re-locate the wheels on the axle ends and against the inner spacers. Make sure the wheels are aligned correctly, with the wheels parallel to the beaching trolley (when viewed from above or below) and vertical (when viewed from the front or rear).

Secure the wheels to the axle with thin CA adhesive.

Re-locate the outer spacers then wheel hub flanges on the axle.

Carefully push them against the wheels and sure them to the axle with thin CA adhesive.

NOTE: *If a small amount of the shortened tang of the ring ties protrude from the back of the plates, don't attempt to cut them away as the assemblies are to frail. To ensure the plates sit flush with the surface of the wood cross members, drill a clearance hole of an appropriate size into the cross members, central and 2.5 mm in from the corner joints. The tangs can then be inserted into the holes when the assemblies are to the beaching trolley.*

Secure the four tie ring assemblies close to the corners of the front and rear cross members of the beaching trolley, using either CA adhesive or if that doesn't grip, two part epoxy adhesive.

Weathering:

To represent weathering caused by the beaching trolley being immersed in water:

Airbrush a sealing coat over the beaching trolley assembly and trestles with a matte sealing coat (e.g. 'Alclad' Flat ALC-314 lacquer, thinned 'Tamiya' Flat Clear XF86 or similar). This will provide a good surface for applying weathering.

Using the water based dark green pencil from the ‘Derwent’ Inktense 24 ink pencils set, apply to the bottom edges of the beaching trolley. Using a brush, slightly dampened with water, brush the applied pencil up the edges to represent staining from algae (where the trolley would have been partly immersed in water).

Using the green from the ‘Tamiya’ Weathering Master (Set E), lightly sponge on the tops of the trestles and beaching trolley, to represent contact wear from the hull of the aircraft.

Refer to Part 3 of this build log and apply ’Flory Models’ Dark Dirt’ clay wash across the axle to achieve a dirty look.

PART 12

FIGURE

PART 12 - FIGURE

The figure chosen for this model is the 'Allarmi' WW1 Aces of Italian A.F. (32063). The resin figure kit is intended to represent the Italian ace Fulco Ruffo di Calabria, although he didn't fly this particular aircraft.

NOTE 1: *Resin is brittle and small or thin parts can easily be broken*. *When working with resin, dust or particles are harmful if they are inhaled or ingested. The casting of many resin items can leave small 'blow' holes and other types of imperfections. Resin parts need to be assembled using CA adhesive, as normal plastic model cement will not bond the parts together.*

NOTE 2: *The figure is based on a photograph in which the pilot is wearing a belt over the outside of his flying jacket. However the figure was not cast to include this belt, even though the end of the belt is supplied. Therefore that item can be discarded.*

Preparation:

NOTE: *The figure is supplied with the right hand holding a walking cane. As I wanted to have the figure leaning against the fuselage I decided to remove the cane. I also chose to use the pilot's head without flying helmet and goggles.*

Before assembly, remove imperfections and seam lines by scraping with a sharp scalpel blade.

Wash the figure parts in warm water with washing up liquid added and then thoroughly dry the parts. This will remove any residual 'release agent' used during casting of the figures, which if not removed, may cause problems when applying paint to the figure.

File or sand the base of the pilot's neck to allow the head to locate lower on the body.

Carefully cut away the walking cane from the pilot's right hand.

Assembly:

Secure the right arm into the body socket, using CA adhesive.

Secure the pilot's head onto the body, using CA adhesive.

Carefully drill a hole of 0.9 mm diameter up the centre of the pilot's left leg.

Insert a length of 0.8 mm rod (e.g. from a standard paper clip) into the drilled hole and secure in position using CA adhesive.

Prime the assembled figure by airbrushing with 'AK Interactive' Primer and micro-filler (Grey-AK758).

Painting:

NOTE: *Unless stated otherwise, 'Tamiya' acrylic paints thinned with 'Tamiya' acrylic paint retarder were used.*

Brush paint the various parts of the figure as follows:

Flying jacket - Rubber Black (XF85) with highlights Neutral Grey (XF53).

Jacket collar and trim - White (X2) with highlights of Dark Yellow (XF60).

Roll neck jumper - White (X2).

Trousers - Khaki Drab (XF51) with highlights of Buff (XF57). Enamel wash of 'AK Interactive' Kerosene' (AK2039) thinned with White Spirit.

Puttees - As for trousers but with more Buff (XF57). Enamel wash of 'AK Interactive' Kerosene (AK2039) thinned with White Spirit.

Shoes - Red Brown (XF64).

Metal fittings - 'Mr. Colour' Stainless Steel (213).

Hair - Flat Earth (XF52) with highlights of Dark Yellow (XF60).

Flesh - 'Vallejo' Model Colour base flesh (70.815 and light flesh 70.928.

Lips - 'AK interactive' Light Flesh (AK3012).

Eyes - White (X2) and Rubber Black (XF85).

Airbrush the figure with a sealing coat of 'Alclad' Flat (ALC-314).

Airbrush the black flight jacket with a sealing coat of semi-matte (e.g. 'Alclad' Light Sheen (ALC-311 or similar).

PART 13

DISPLAY BASE

PART 13 - DISPLAY BASE

The display case is made from sheets of 3 mm thick piano black Acrylic sheet, cut and cemented together to form a 'shouldered step' for seating the transparent top, which is fabricated from 3 mm thick clear Acrylic sheet. This was made to measure for this model by an on-line manufacturer, who also made the angled plaque mount, which was secured to the display base with a contact adhesive.

www.inperspextive.com

The brass (brushed silver) plaques were also made by an online manufacturer and were secured to the angled mount with contact adhesive.

https://the engravingshop.co.uk

For this display I chose to use the 'Abandoned Airfield' display mat (1:32 scale), supplied from 'Coastal Kits'.

http://www.coastalkits.co.uk/newstore

The display mat consist of a photograph, taken from above and at a slight angle, then printed with odourless latex ink onto laminated matt vinyl over a 3mm thick 'Foamex' base board. These mats, when viewed from above, give a good representation of the chosen terrain, but when viewed from 'ground level' are obviously flat and featureless.

Using a sharp, sturdy blade, such as a 'Stanley Knife' or similar, carefully cut around the outline. Do not try to cut entirely through the mat in one pass. Instead, take three cuts to separate the outlined mat from the rest of the mat.

Clean the cut edge of the mat by sanding. Sand downwards from the photographed side of the mat, to prevent upwards sanding possibly lifting the photographed edge.

If required, mask the top surfaces around the edge of the cut out mat and brush paint with a suitable acrylic coloured paint.

Position the completed model with the figure and ground equipment and mark the locations of the two trestles, beaching trolley and the pilot.

Apply PVA adhesive to the underside of the mat and position it onto the display base.

Apply pressure on the mat, such as books or similar, until the adhesive dries.

Secure the beaching trolley to the underside of the fuselage, using two part epoxy resin (e.g. 'Araldite Rapid' or similar).

NOTE: *During the next step, locate the aircraft on the beaching trolley and two trestles so the correct position on the display mat can be ascertained.*

Mark the position of the two trestles.

Secure the two trestles to the display mat using two part epoxy resin (e.g. 'Araldite Rapid' or similar).

Re-position the aircraft onto the trestles an mark the position for the support pin in the pilots leg.

Use a sharp point or drill to create the location hole for the pilots support pin.

PART 14

COMPLETED MODEL PHOTOS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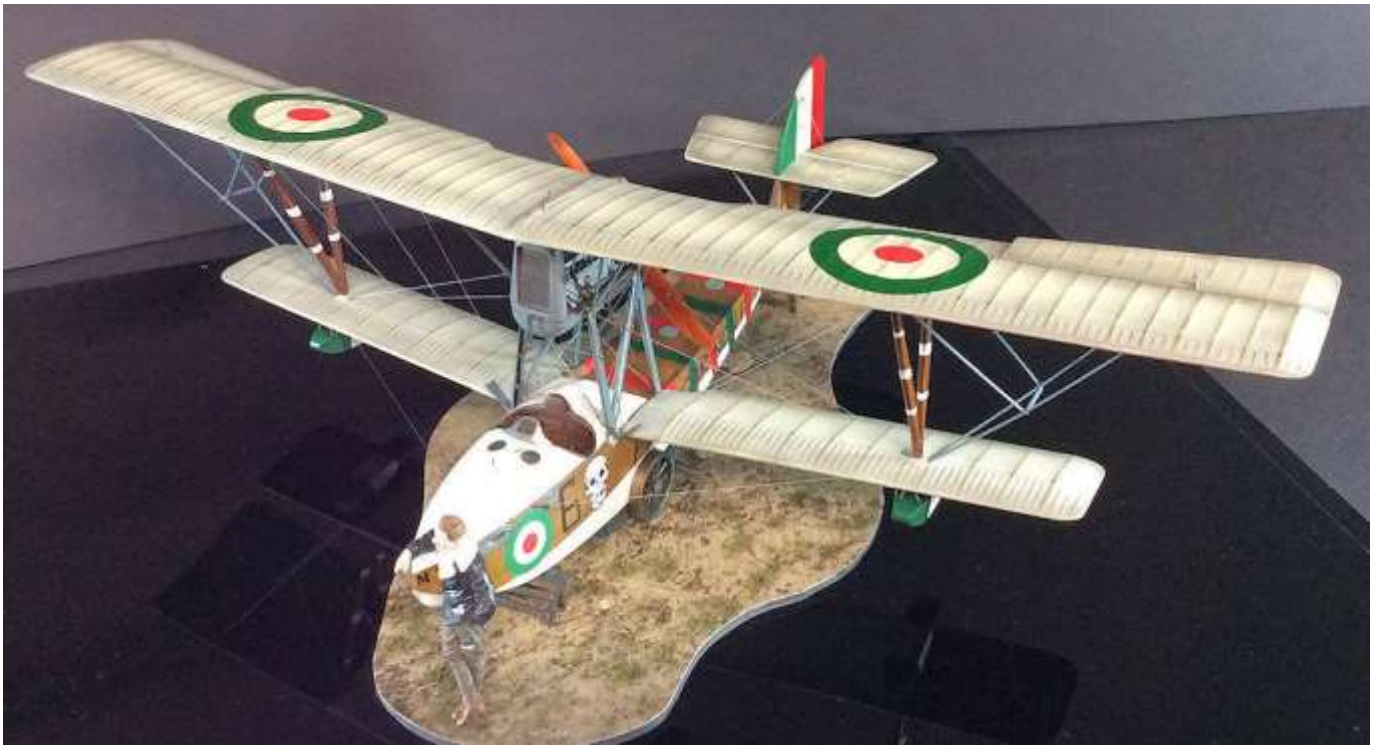


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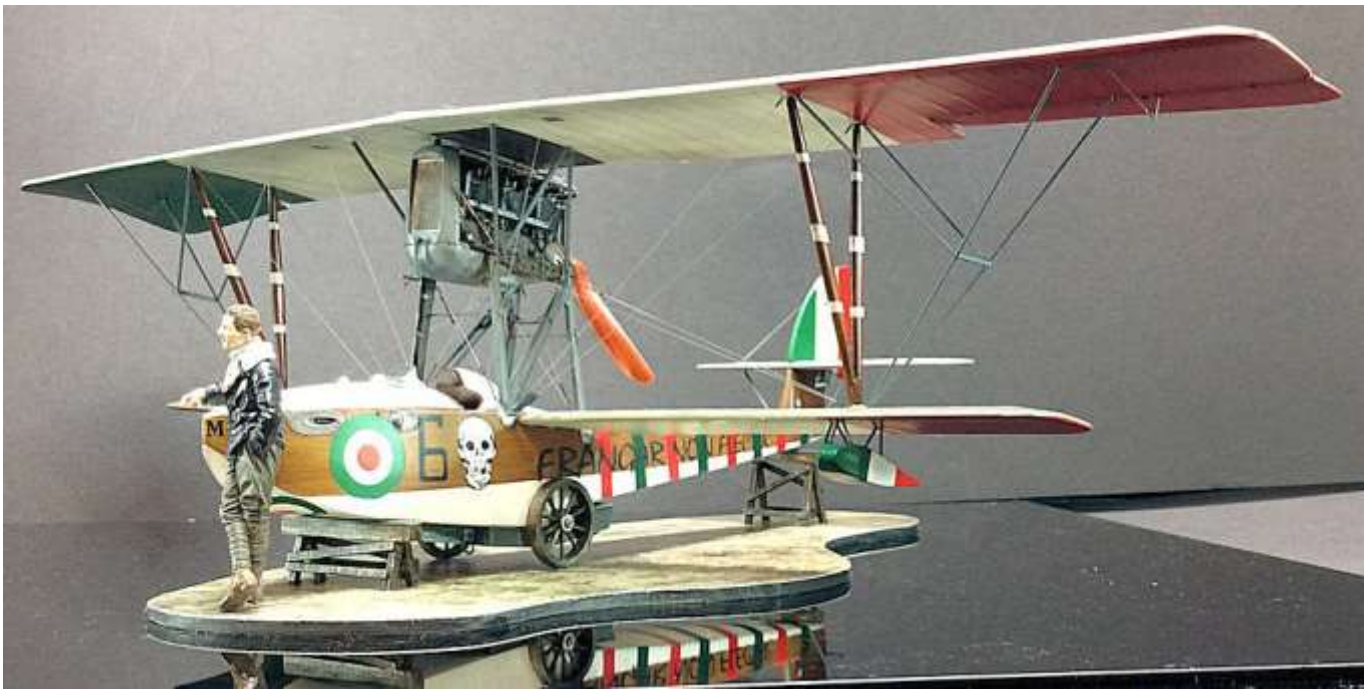


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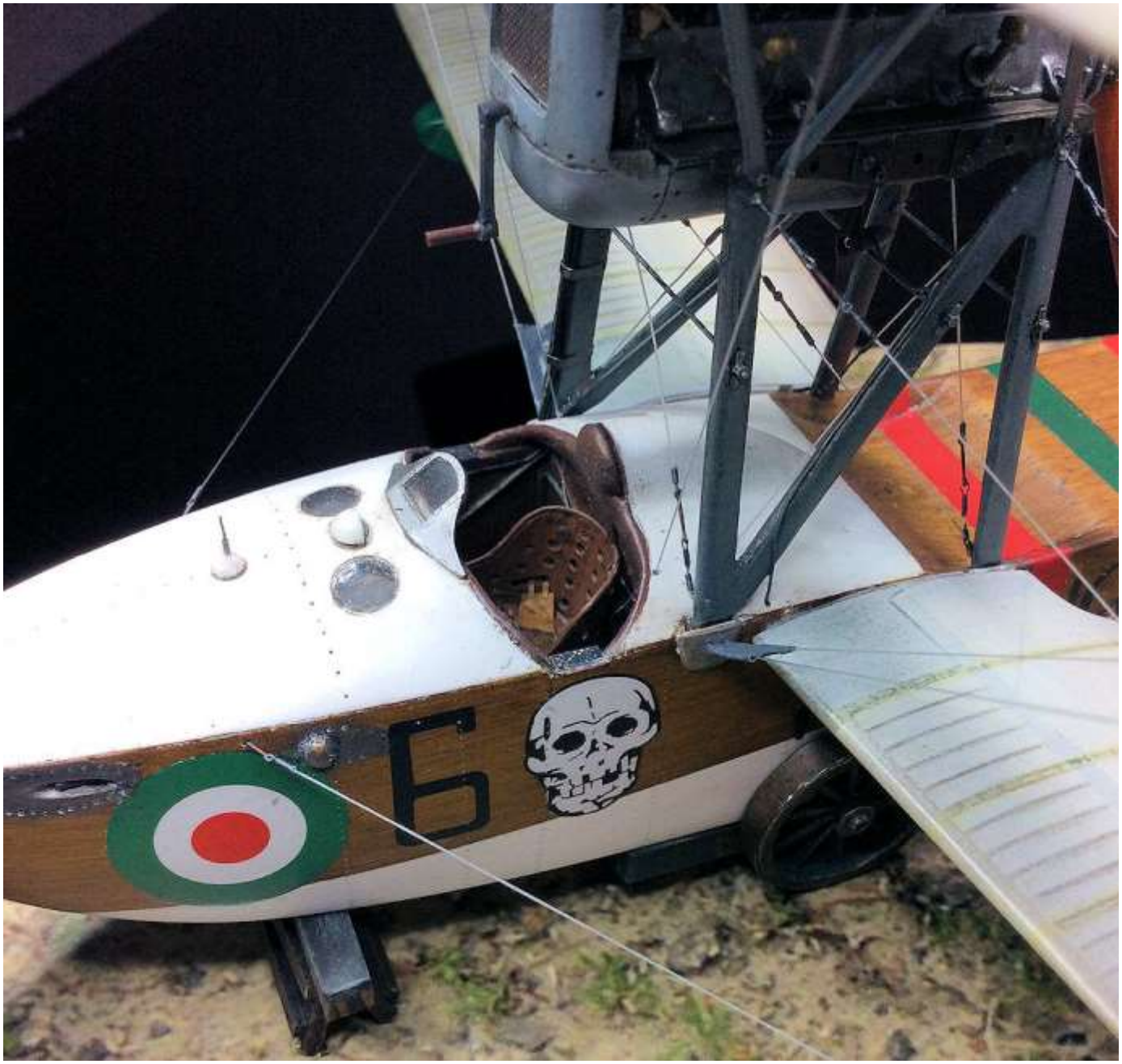
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END