

Fokker F.26 Phantom International Resin Modelers Association¹ resin kit

Monoplane passenger

Scale 1:72

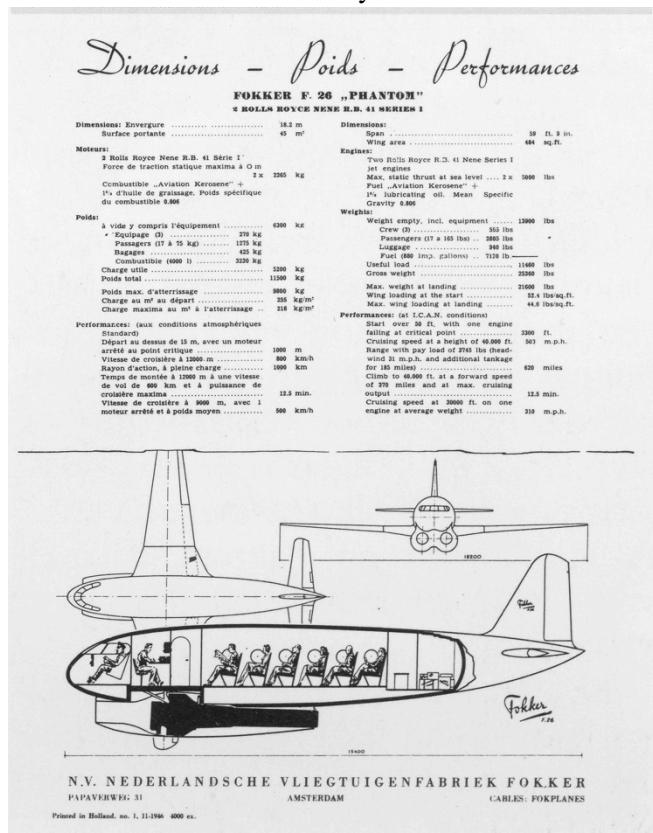
Fokker Chief Engineer Marius Beeling was in charge of the F.26 Phantom project, within the company known as *ONTWERP* 232, and his team completed two scale models initially for exhibition and wind tunnel testing. This was the catalyst for construction of the Phantom.

The F.26 was considered an advanced design, especially in consideration of what the Germans had done to the Fokker factory, from reducing its role in aviation to destroying or removing all of its production equipment to Germany during the war.

The Fokker F.26, equipped with British Rolls-Royce Nene jet engines, was presented at the 1946 Paris Air Show in November. However, jet powered airliners were considered too futuristic by many of the world's airlines and transport companies so no demand resulted at that time. Fokker later claimed that the F.26 was merely a conceptual design, however, the facts seem to prove otherwise.

At the behest of Albert Plesman, head of KLM, Fokker initiated a project in cooperation with the British De Havilland Aircraft Company to produce a jetliner between the two nations. Plesman felt this would distribute the cost more economically since he did not feel Fokker could achieve such a project on its own, even with government subsidies. The Dutch institute for aircraft development, the Nederlands Instituut voor Vliegtuigontwikkeling (NIV), has supported the project.

The end result was that after joint research the British took all of the data and used it for their own De Havilland D.H. 106 Comet, which would fly in 1949 as the world's first built jetliner. Later the British would experience this same scenario when they contributed data from their own Miles M.52 to their American partners and the U.S.A. took the data for use on the Bell X-1.



[Source: Thijs Postma]

In appearance the Fokker F.26 Phantom was rather unique in that the placement of the two Rolls-Royce RB.41 Nene engines was beneath the fuselage. The aircraft was an all-metal design with accommodation for 17 passengers with a crew of 3 in a pressurized cabin. Seating was arranged for two rows on the starboard side with a single row on the port side. Two cargo bays and a restroom were located at the rear of the aircraft.

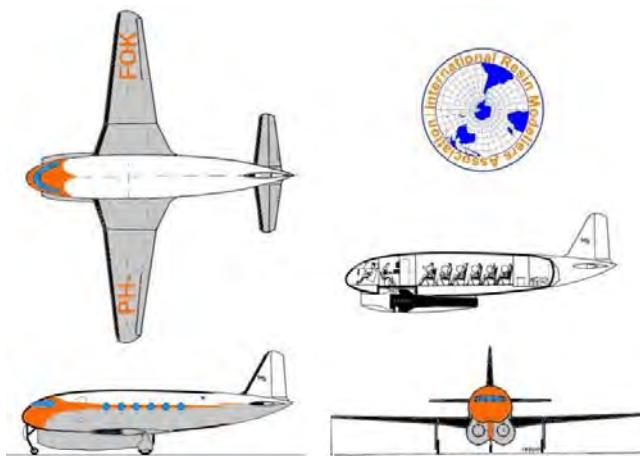
Although the F.26 did not enter production beyond some component parts manufacture, wind-tunnel research and market testing did help with development of the British De Havilland D.H. 106 Comet, the Avro Canada C-102 Jetliner and also with the new Fokker F.27 Friendship of a few years later.

The F.26 had a fully retractable landing gear and the Rolls-Royce Nene engines with a thrust of 2.2 kN each were the most powerful engines available at the time. The aircraft was to be flown by two pilots and one radio operator.

Design studies showed that the F.26 had an economical cruise speed of 800 km/h with a range of 1,000 km.

There is very little documentation available on the F.26; I have a list referring to several documents, but most of them I have not been able to obtain access to. Only one factory drawing exists, a copy of which has been included in the appendix².

The kit comes in a sturdy carton box and contains the resin parts packed in several plastic bags, transparent parts for cabin and cockpit windows, a set of decals for the registration PH-FOK and the Fokker logo in three different styles, building and painting instruction sheets, a short description of the historical context and a numbered certificate of authenticity (my kit had number 21).



The parts contain few air bubbles and are nicely finished, but have large pieces of resin residue at the places where the mould halves were joined. The interior is rather well detailed although little will be visible once the model has been built. The walls of the cabin are rather thick.

Postma (ref. 3) and Vredeling (ref. 9) report the dimensions of the F.26 and both also give a three view dimensioned drawing, while surprisingly Spirou (ref. 10) provides a quite accurate cutaway drawing.

	Ref.	1:72	model
Span	18.20 ³ /18.26 m	252.7/253.6 mm	252.5 mm
Length	15.40 m	213.9 mm	207.5 mm
Height	4.00/5.75 ² /5.90 m	55.5/79.9/81.9 mm	75.8 mm
Engine	Rolls-Royce RB.41 Nene, 2 x 22.24 kN		
Crew/passengers	3/17		

So the kit is quite well to scale.

General

The first job in preparing the parts has been to remove the excess resin from the large parts. I have done that by hand, as the use of my drilling machine with a sanding disc caused too much dust, which was flying everywhere. When dry-fitting the parts they fitted well, but showed still quite large gaps, so extensive use of putty was required. Next I have washed all parts in a soapy bath.

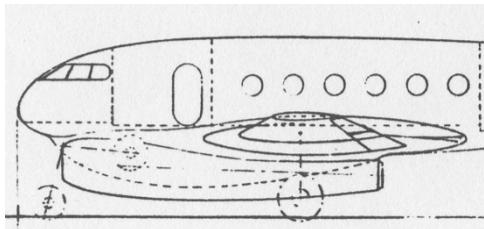


The instruction sheet is very simple. It contains a list of the 61 parts, a textual description of the building order, a three-view drawing and suggestions for the interior and exterior painting scheme. The kit producer suggests an orange with white and aluminium exterior finishing; the only other suggestion comes from Thijs Postma, reproduced above, which seems to be in the typical "Avio-Diepen" red colour.



Fuselage modification

When examining the nose wheel and the nose wheel bay of the model I noticed that the first would never have fitted in the second without a complicated secondary folding mechanism, so something was not correct here. As drawings of the F.26 are very scarce (in fact I only discovered now the one and only original Fokker drawing of the Phantom 0020-7627, *ONTWERP 232* in the collection of Wim Vredeling, ref. 9) and the one picture of the wind tunnel model I have found showed only the approximate shape of the flying aircraft, the model designer apparently used his imagination here. However, the factory drawing shows clearly that the nose wheel was not attached to the tip of the nose, but more backwards approximately at the forward edge of the engines, that it was retracted in a wheel bay between the two engines and that the rounding of the lower part of the fuselage between the two engines started a bit before the nose wheel attachment.



So it became clear that a major modification had to be done here. I have started by measuring the points on the drawing, by indicating the beginning of the rounding on the nose (the lowest blank line) and by drawing the shape of the wheel bay on the engine part (the black hatched area).



The width of the new wheel bay I have kept the same as the original one on the model. I have made a cut with a saw along the edges of the wheel bay and removed the material by drilling holes in it and removing the rests with knife and sanding. I have filled up the forward part of the original wheel bay in the nose with a piece of plastic strip, sanded it in shape and glued the two inlets to the remainder of the engine section.

To correct the rounding of the lower forward part of the fuselage between the two engines I have made the room between the front part of the two engines half a millimeter wider at each side, where I will glue pieces of 0.5 mm plastic with the correct profile. These pieces I have cut in the shape copied from the scaled Fokker drawing and glued them in place with thick cyanoacrylate. I have filled up the room between the two profiles with a piece of plastic strip.



I have produced a "fairing" between engine inlets and the lower side of the fuselage from Miliput putty. When the putty had set, I have carefully separated the engine part from the fuselage and have filed and sanded the plastic and the fairing in shape. I have also cut the aft end of the plastic strip back to the length that is compatible with the place of the nose wheel according to the drawing *ONTWERP 232*.



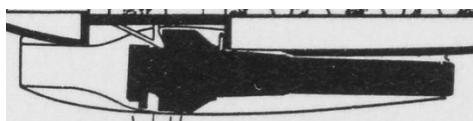
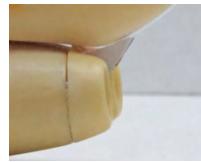
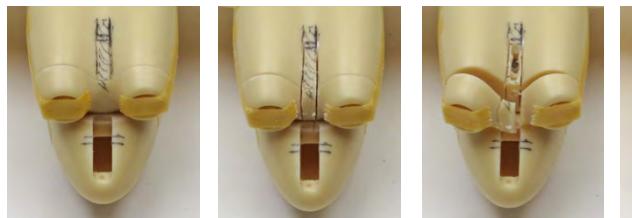
One of my fellow modellers pointed out, that the central cone in the engine inlet is not logical. The Rolls Royce Nene engine has a centrifugal compressor, and shows not this characteristic, which is typical for engines with an axial compressor. Also, the engine is placed rather far backwards (closer to the center of gravity), as can be seen in one of the original drawings, which shows no trace of such a central body. Probably the excellent painting of the F.26



Phantom by Thijs Postma, which shows indeed some cone-like structure, causes this "error". So



I have removed the central cone from each inlet and drilled the inlets a bit further out with increasing diameter drills. I have also drilled out the rear of the engine na-



celles a bit more to accommodate the exhausts better. The new nose wheel is also visible on this picture. I have separated the wheel plus suspension from the original nose wheel and produced a new leg from 1 mm brass rod. I have detailed it with slices of various diameters plastic tube and rod and some pieces of 0.25 mm plastic strip to a realistic nose wheel assembly. The height has been adjusted to that indicated in the side view on the drawing.

The retraction cylinder has also been constructed from various diameter plastic tubes and rods.



I have also fitted the tail surfaces to the rear fuselage. They fit a resin pin in holes in the rear fuselage, a feature I have never met in a resin model up till now. However, the holes were a bit too narrow, so I had to enlarge them to 1.2 mm. One of the pins contained an air bubble (one of the few ones) and broke; I have replaced it with a piece of 1.2 mm plastic rod.

Also, when dry-fitting all parts together, it appeared the elevator halves were not at the same height, so I have drilled a new hole 2 mm lower.



As the walls of the fuselage are rather thick, I have also tested two ways of producing the windows to see which one would give the best result in from the point of view of transparency and of camouflaging the wall thickness. For the window at the right I have used Microscale Kristal Klear, the one at the left is made with Humbrol Clearfix. I have also engraved two horizontal panel lines at each side, one at the height of the floor and one above the windows.

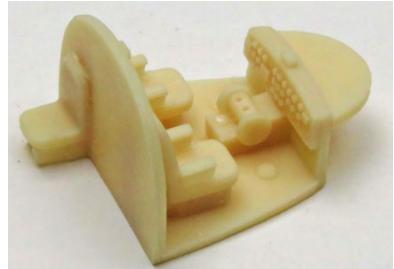


The Clearfix window dried very clear, but showed a crackled surface. Also, it does not camouflage the thick cabin wall very well. The Kristal Klear window is less clear, but has a smooth surface and optically disguises the thick wall, so I have opted to use this last solution.



Cockpit

The cockpit is moulded from one piece of resin but is rather well detailed. The two control columns are a bit crude, but as they will hardly be visible through the cockpit windows, I have left them as they were.



The cockpit rear bulkhead had a door engraved in it, which I have removed, such that later on with an open cabin door still part of the interior will be visible.



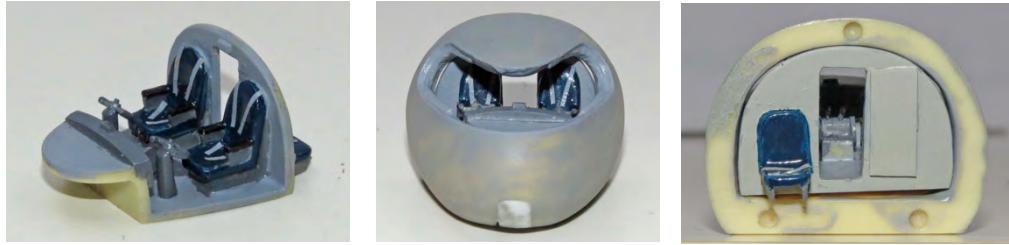
The cockpit windows require quite some cleaning. Apparently they are also made from resin, at least they smelled the same when I sanded them. They fit very well, flush to the forward fuselage surface. While the other, opaque resin parts are almost free from air bubbles, this transparent part has many of them, and only a few of them can be repaired because these are in the window frame.



The cockpit seats as well as the passenger seats are not really to scale; they are only 3.5 mm wide between the armrests, corresponding to 0.25 m width, while 17 inch (0.43 mm) is the minimum in reality. The thick resin walls probably drive this small size. The seats are however well proportioned.

I have painted the floor and walls of the cockpit mid grey (Humbrol 128) and the instrument panel, controls and seat frames dark grey (Humbrol 125). The instruments I have dry brushed black.

I have mounted two ends of grey painted plastic strip with a top formed from thick cyanoacrylate as throttles. I have painted the seat covers dark blue (Humbrol 15) and the arm rests black (Humbrol 33). The seat belts I have made from narrow pieces of grey painted Tamiya tape.



Cabin

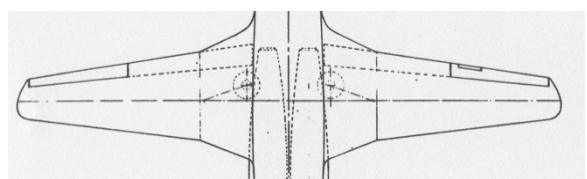
The cabin interior is very basic: a floor panel, where the seat positions have been marked and the eighteen passenger seats.

The drawing on the sheet with performance figures shows however much more detail, so I have produced a front and rear wall from 0.5 mm plastic sheet, simulating the doors to the toilet and freight room in the back with pieces of 0.25 mm plastic sheet material. The correct cross-section I have established by trial and error.

I have painted the cabin floor grey-blue (Humbrol 144) and the walls light grey (Humbrol 166).



The passenger seats all have a bit of resin hanging at the rear, which has to be removed and requires sanding each individual piece. I have painted the frame of the seats dark grey (Humbrol 125), the covers dark blue (Humbrol 15) and the arm rests black (Humbrol 33). As the cabin seats were still visible through the windows and door opening, I have made simple seat belts from narrow slices of grey painted Tamyia tape. A final dry fit showed that the floor with seats and the forward and aft wall fitted well in the fuselage.



Fuselage assembly

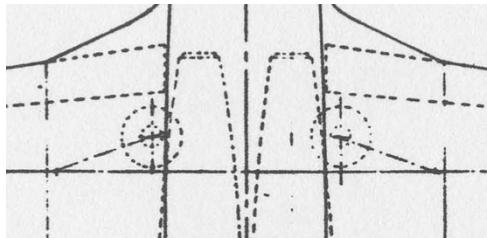
I have glued the forward, mid and aft fuselage sections together with thick cyanoacrylate glue. I have also engraved some vertical panel lines in the mid fuselage section and horizontal panel lines in the tail section. In the space under the forward part of the cabin floor I have attached two pieces of lead with white wood glue. I have also done a balance test to see where the center of gravity was located. This seemed to be all right, but I have repeated it on the model when wing and tail had been assembled to prevent the model to be a tail sitter.

Wing and tail surfaces

The wing on the Fokker drawing shows split flaps, which are possibly divided at the mid wing and a trim surface at

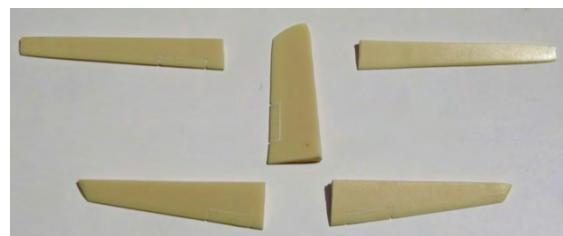
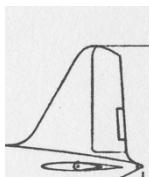
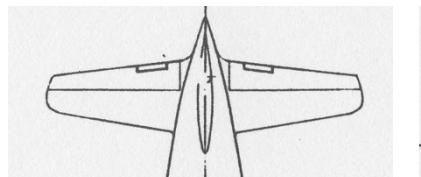
the port aileron. It also shows an interrupted line, which indicates probably the location of the rear spar of the wing torsion box, as the main landing gear struts are attached to it. Flaps are engraved in the wing, the partition between flap and aileron is missing and the panel lines of the wing spar, deicing boots and flap attachment are missing, as well as the trim surface. I have engraved these panel lines in the wing surface, as well as a line representing the forward spar of the torsion box.

When working on the wing underside I noticed that also the main landing gear attachment on the model was not in the correct location compared to the drawing; on the drawing it is further forward. Also, the way the gear is retracted is different; the drawing indicated that it is folded slightly backward, and not sideways, as on the model.



From the drawing it seems there might have been some interference between wheels and the rear part of the motor nacelles, but in the three-dimensional case this may not be the case. It makes one wonder, however, how the inner part of the landing gear doors would be formed and deployed. The length of the landing gear legs in the kit is a bit too short and the location is not correct.

I have separated rudder, elevator and ailerons from wing and tail surfaces, decreasing the span of the elevator halves a bit to enable a firm attachment to the fuselage. Fin and stabilizer have a fine, 1.2 mm pin-hole connection, something I have rarely seen with resin models. Alt-



Each elevator half has a trim surface and the rudder one trim surface. These I have engraved also, as well as panel lines at the tip and at the leading edge of fin and stabilizer halves.

The fairings for the trim surface

push-pull rods I have produced from sesame seeds cut in half lengthwise. Ailerons and elevator halves have been painted aluminium, the rudder red, white and blue, as for the F.27 prototype, which flew a couple of years later.

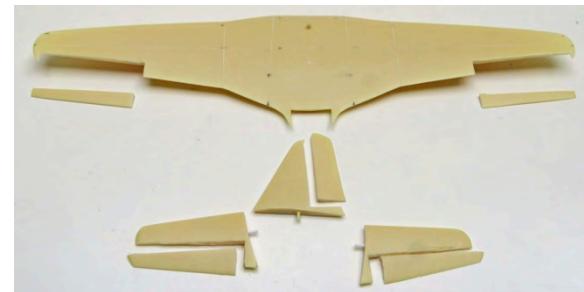


Undercarriage

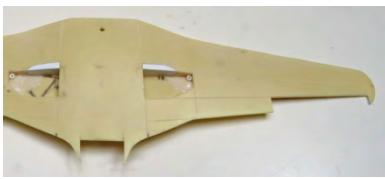


The landing gear configuration as modeled in the kit interrupts the main wing spar, which cannot have been the case in reality, and the gear is also attached at some arbitrary place, where no hard point can exist. On the Fokker drawing it is attached to the main spar, which seems more logical. So I have increased the wheel bay at the outboard side with various grinding tools and produced a "spar" from plastic inboard. From bits of 2 by 1 mm plastic tube I have produced a new socket for the landing gear legs.

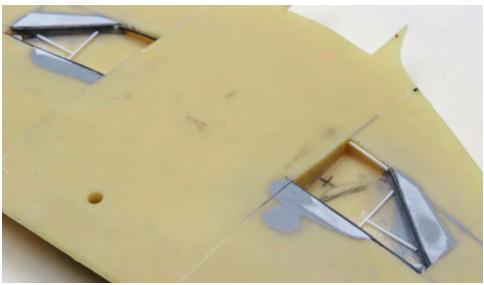
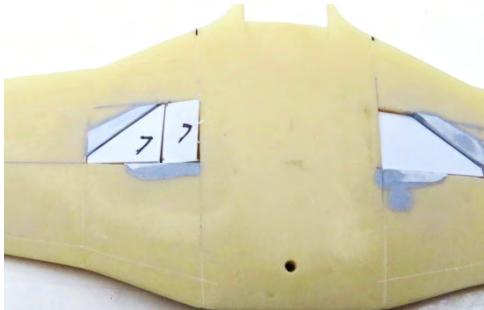
According to the drawing the wheels should have a diameter of 12 mm, but the ones in the kit have a diameter of 13.9 mm. They also have a rather pre-WW II appearance, a big rim and a thin tire. In my spare box I still had a pair of wheels



with the correct diameter, but again with a pre-war appearance. In the end I have decided to use two wheels of the ESCi Fokker F.27 kit of 11 mm diameter.

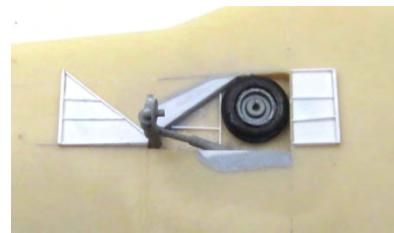


The picture at the right shows the wheel in stowed position according to the drawing, which determines the length of the leg (a bit shorter than on the drawing, because I did not want to extend the wheel bay beyond the root wing rib. This picture at the left shows where the leg support strut could be attached, between wheel and main wing spar, at the black pencil lines in the wheel bay.

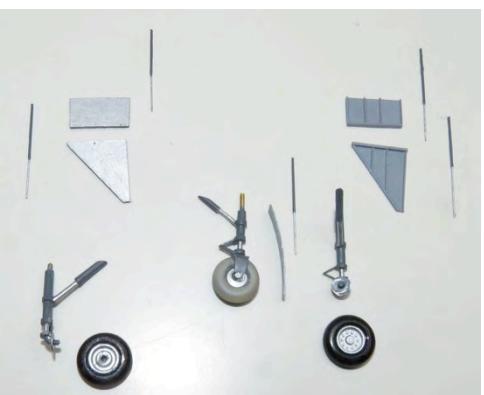


The landing gear legs themselves I have built up again from pieces of plastic tube of various diameters around a piece of 1 mm brass wire and pieces of plastic strip. The extension/retraction cylinder has been made from plastic rod of 1.0 and 1.6 mm. I have made the rear of the wheel bay smaller with some pieces of plastic, running from the landing gear attachment point to the edge of the wheel. I have made a new wing skin over the opening with pieces of 0.5 mm plastic sheet.

Next I have made new wheel doors from 0.5 mm plastic sheet, trial-and-error cut to the correct size. I have split the doors in a triangular and a rectangular part and “reinforced” the rear side with stringers made from plastic strip 0.5 x 0.7 mm and 0.25 x 0.5 mm. I have also made some (symbolic) stringers in the wheel bay. A drum brake disc has been added to the undercarriage legs made from a 4.0 mm disc of 0.25 mm thick plastic. The hydraulic cylinders for opening and closing



the landing gear doors I have made from 0.5 x 0.3 mm and 0.3 x 0.1 mm brass tubes. Hydraulic lines I will mount only when the model is completely assembled.



I have painted the wheel bays and the inside of the landing gear doors light gray, the “fixed” parts of the landing gear legs, support struts and door cylinders dark grey, the wheel hubs, “movable” cylinder parts and brake drums aluminium, and the tires black. The curved part next to the nose wheel is the nose wheel door, which still has to be separated in a part attached to the nose wheel leg and a part attached to the wheel bay. To test the fitting of the landing gear I have put the legs in their respective mounting holes. When mounting the wheels the appearance of the model will be correct. Note that this picture has been taken after balancing the model and completion of the fuselage-wing-engine compartment assembly.



Balancing the model

When dry-fitting the parts the model appeared to have a definite tendency to sit on its tail with the new position of the main landing gear legs⁴. To correct this I have taken a number of measures. First I have made the massive tail section lighter by drilling a deep, 10



mm hole in the cone. I have also filled up the old wheel bay in the nose section up with fishing leads.



In the wing I have drilled two holes of 10 mm; the one before the main spar I have filled with fishing leads, the one after the spar I have left empty. In the engine part I have drilled three holes in the forward part, as close as possible to the nose wheel bay, and have filled them all with fishing leads.



I have removed the forward part of the bottom side of the fuselage. I will place here a piece of lead, once the cabin floor is in place. The last possibility to make the forward part of the model heavier is to place some lead in the room for the radio operator, as this will not be visible once the model is assembled. I have not used this option.



Assembly

I had to put quite a large amount of putty on the joints between the fuselage parts to cover differences in dimensions. Next I have glued



the wing under the fuselage and the engine compartment under the wing using generous quantities of thick cyanoacrylate glue to compensate for the bad fitting of the parts. I have also engraved some panel lines in the engine compartment.



There were quite some gaps left between the components. The large gap between the forward fuselage and the engine compartment I have closed with a strip of 0.5 mm thick plastic, cut to size and shape to fit the profile of the wing leading edge and the front fairing of the nose wheel bay. The remaining gaps between wing, fuselage and engine compartment I have closed with Valejo putty, except for the big hole at the wing leading edge, which I have filled with Tamyia putty after the Vallejo layer had hardened.



I have checked for the last time the location of the center of gravity of the model with tail surfaces and ailerons attached by balancing it



on two 1 mm diameter ends of brass rod, placed in the holes where the landing gear legs will be glued later. As the picture shows the model has no tendency any more to sit on its tail.



Finishing these joints neatly has been an almost endless process of applying putty, sanding, applying putty and painting the surface to check smoothness, applying putty, ad infinitum. The last check has



been a layer of aluminium paint, which reveal any shortcoming ruthlessly. In the end the result was acceptable.



I was not very satisfied with the front view of the engine intakes; it is a black hole without any detail, while the Rolls Royce Nene engine has a lot of detail at its front end, as illustrated by this picture copied from Wikipedia. But the intake of the model is only 12 mm deep, and the forward part of the engine





begins at 22 mm according to the scaled side view in the Fokker documents, so I will have to live with it. I did not dare to take out more resin material, as it contributes to the balance of the model and this would increase the tail sitting risk again.

I have joined the fin and stabilizer halves to the aft fuselage. They fitted quite well,

and I have finished the joints to the fuselage with a small amount of Valejo putty, finishing it off with some Tamyia putty when it had dried (the Valejo putty is less easy to sand; it stays a bit elastic).



800 sanding paper before giving the top of the fuselage and the fin a first coat of white.

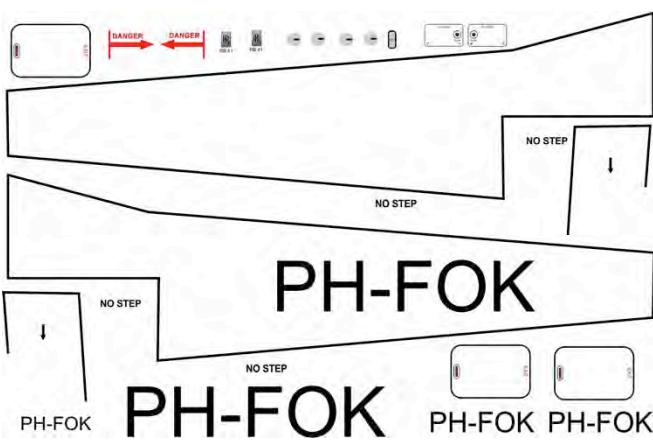
All aluminium surfaces have been given a new coat of paint. Small areas not covered well could be retouched without leaving disturbing traces. I have temporarily mounted the landing gear to measure the relative position of the wing tips. A small adjustment to the depth of one of the mounting holes had to be made to get the tips on the same height.



decals supplied with the kit, only the Fokker logo with the type designation F.26 will be used. I did not like the large registration numbers on the wings and have prepared smaller decals in analogy with the Fokker F.27 prototype, which will be placed at the underside of

I have given the top of the fuselage two coats of white paint. Although the general impression was quite good, some "darker" areas still shone through, so a third coat (after light sanding of the surface) was necessary.

I will not use the original



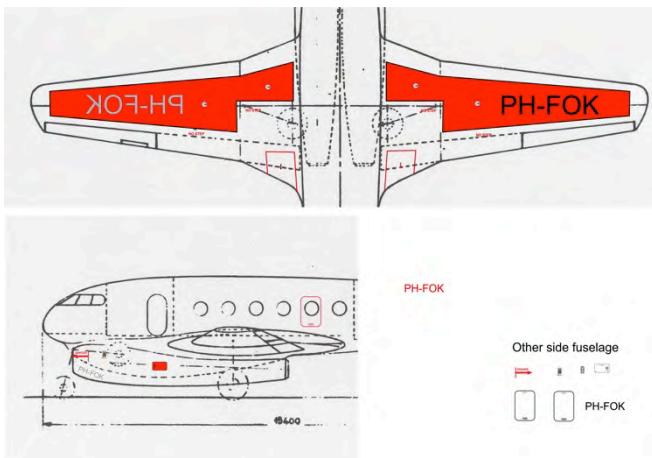
the left wing and the topside

of the right wing. Smaller registration numbers will be placed on the aft fuselage, as the fin is too small to accommodate them in addition to the Fokker logo. An even smaller registration number will be placed on the nose wheel door. I will also provide the aircraft with a red, white and blue rudder, as was the case with the F.27 prototype.

The outline of emergency hatches (8 by 12 mm) will be placed around the one but last cabin window at each side and opposite the door. Next to the rear



emergency exits the “hard” part of the wing will be indicated with an arrow in the escape direction. Also, the NO STEP areas will be indicated.

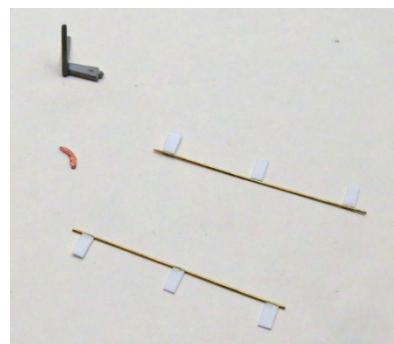


Danger signs for the engine intakes will be placed on both sides of the forward fuselage and on each side of the engine compartment I will apply the Rolls-Royce logo with the Nene engine type number (RB.41) and an inspection hatch. On top of each wing I will place two tank covers and on the fuselage a connector for electricity (and possibly intercom). Approximate location of the decals is shown in the picture below (decals rendered red or light grey for clarity).

The decals have been drawn with CorelDraw⁵, printed on my inkjet printer and sealed with Microscale Liquid Decal Film. The small, 0.5 mm high text specifying the engine type is still clearly readable.



mm plastic strip. I had left a V-shaped antenna left from a Fokker F.27 MPA kit for the top of the fuselage and have made the fitting for the wire antenna between fuselage and top of the fin from a piece of bent copper profile.



The picture of the F.27 prototype also gives some clues for the other equipment: the two ADF antennae, the antennae at the top of the fuselage, the pitot tubes at the wing tips and the anti-static devices at the control surfaces. I have produced the ADF antennae from 0.4 mm brass wire and 0.25

In the wing leading edge at both sides I have cut out a 2 x 4 mm slot for the landing lights at the place where the wing sweep changes and I have painted the deicing boots of wings and tail planes black (Humbrol 85). Originally I had painted also the leading edge of the wing black at the location of the landing lights, but that seemed not logical, so I have covered the black again with aluminium paint.

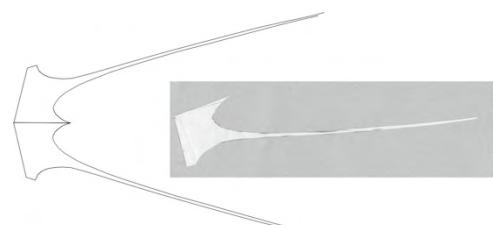
The exhausts of the Nene engines are rather close to the fuselage underside. Inspection of the F.26’s namesake the MacDonnell F.4 Phantom, which has the exhausts in a similar position, showed that the skin of the fuselage at that place was covered by a different material,

probably titanium or even steel, attached with numerous bolts. I have devised a similar solution for my Phantom, and have made a “bolt” pattern with my riveting tool and have painted the fuselage surface gunmetal (Humbrol 53). I have also mounted the exhaust pointing slightly sideways, as De Havilland has done with the engine exhausts of the Comet. The exhaust pipes themselves I have painted gunmetal too.

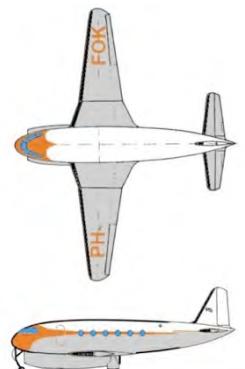


Cheat line

The instruction sheet suggests a rather complicated cheat line to decorate the model,

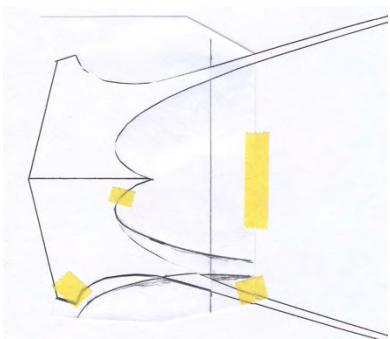


probably inspired by the drawing by Thijs Postma and the original Fokker artwork. I have sketched a half-outline of it on the forward fuselage, copied it on a piece of paper, cut the shape out and fitted it on the model and trimmed it until it resembled the drawing. I have then mounted a scan of the shape in a fresh Corel Draw drawing and



redrawn the outline with Corel Draw elements.

I have mirrored this shape and fitted both halves together. I have fitted a print out of this drawing on the fuselage to check whether it gave the correct result. I was planning to use a “negative” of this shape as a paint mask. The “lightning” effect at the aft fuselage can be made easily by obliquely cutting the cheat line paint mask and shifting it slightly up and forward.



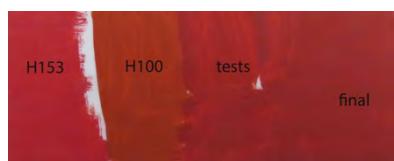
However, the negative of the shape did not have the desired effect at all, when fitted on the fuselage. This is caused by the double curvature of the fuselage and the impossibility to follow this curvature with a sheet of paper, which allows only for a single curvature.

So I have (again) sketched the correct shape of the cheat line on the faulty paper template, have glued it on a copy of the original drawing and have drawn with old fashioned, conventional drawing tools a flowing line.

Next I have copied this drawing, folded it on the horizontal line and have cut out the new shape. Learning from last time, I have again fitted it on the forward fuselage, and this time it fitted far better. This paper shape has been copied on masking foil and the final mask has been cut out with a sharp scalpel.

I have tried to match the red-brown colour of the gouache by Thijs Postma, which is very likely the so-called “Diepen⁶-red”. I have achieved a reasonable match with a 50/50 mixture of Humbrol Matt Red Brown (H100) and Insignia Red (H153), darkened with some drops of Violet (H68).

Next I have sanded the paint ridge between white and aluminium very carefully with grain 1200 sanding paper and painted the forward part of the fuselage. The result is rather satisfying; it gives the desired effect.



I have repeated the sanding process for the aft part of the cheat line, but as the line is very narrow, the result here was that I have to repaint the aluminium lower part of the fuselage; the damage on the white part was only in the gloss layer, and will disappear when the final coat of varnish is applied.

The aft part of the cheat line I have conventionally masked with masking tape. I have glued the pieces of tape on a plastic sheet and carefully them to the required size in order to attach them symmetrically to both sides of the fuselage. The small “lightning” shape I have produced by making a slanted cut in the tape (again at exactly the same place left and right) and gluing the aft piece slightly shifted forward and upwards over the forward part, as shown in this reconstruction at the left.



In applying the tape I have continuously checked whether the line along the fuselage showed a continuous rising or falling curve along the sides by looking along the model from the front. This has led to several corrections before I could start painting. Two layers of red paint covered sufficiently. Upon removing the tape it ap-

peared that the aft end of the line had not been painted well; it was either not covered, or paint had flowed under the tape, so “manual” correction was required.

I have retouched the aluminium side of the cheat line free hand instead of masking it again with all risks of mismatch. This worked out quite well.

I have modeled the landing lights by a 1.8 mm diameter disc of aluminium foil, covered with a drop of Kristal Klear to form the flashlight. I have also made in the same way a landing light attached to the nose wheel landing gear leg. The cover of the landing lights in the wings is a piece of transparent tape, secured at the corners with a very small drop of thin cyanoacrylate glue.

Finishing the model

Application of decals

The aluminium finish of the model is damaged very easily. I had to redo the lower side of the wings as scratches were visible where the model had been resting on more or less “sharp” edges (plastic boxes). I have given the model an overall coat of gloss varnish for the application of the decals, but also to protect it from further damage. To test the decal application I have done the large decal on the right wing, which I have applied with ample water, but no Set or Sol. This worked very well; no air bubbles or silvering could be observed. Also, the decal fell well into the panel lines.

Encouraged by this I have also applied the registration number decal on the fuselage, the wing escape route decal and one of the emergency exit decals, and they fitted well. I have applied the emergency hatch decal over the window opening to test whether it was possible to remove the part of the decal over the window opening when the decal had dried. That was successful, so I have used the same method for the decal at the other side of the fuselage.

I have applied the Fokker signature with the subscript F 26 on the fin. The first attempt was not successful; even worse, once the decal was applied to the gloss varnished surface, it was impossible to move it, and when applying more water to float it, the decal folded on itself. I did not manage to correct that, and in the process de-

stroyed the decal. So on the other side I used the Fokker logo alone, and I have made new decals for the F 26 subscript.

Next I have mounted the remaining decals; no problems to report. For the pictures I have dry-fitted

the cockpit windows to show the nice streamline of the F.26 design. The decals on the engine compartment fitted quite nicely and made the model much more lively. I have sealed the decals with a coat of satin varnish. I have also painted the outside of the passenger door in a pattern matching the fuselage decoration.



The undercarriage

When the varnish had dried, the undercarriage has been mounted. I



have decided to mount the main wheels also, as I did not dare to put the heavy model continuously on the brake drums. The pictures show that the model has the right attitude when placed on its wheels.



I have also drilled a two millimeter hole in the passenger door to simulate a window that in my opinion should certainly be there for safety reasons and finished the inside of the door with various bits of plastic and metal wire. I have glued the door to the fuselage outside with Kristal Klear.



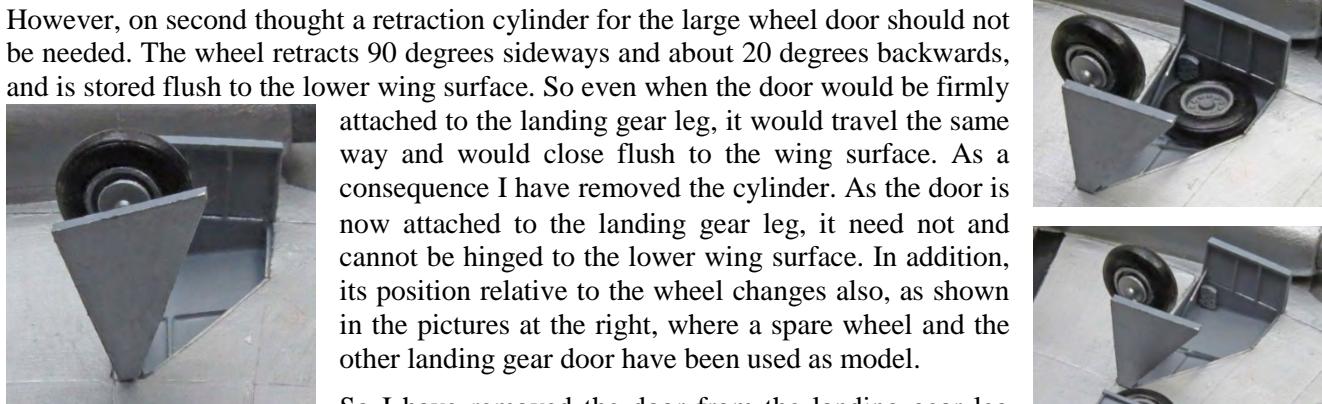
To have a stable working support for the model when working on the landing gear doors and wheel bay equipment, I have cut out a stand from a small cardboard box; the edges of the box, on which the model is resting, I have covered with tape to prevent damage to the model's paint.



I have glued the large wheel door against the main landing gear leg with two drops of thick cyanoacrylate and have positioned the hydraulic cylinder between the middle of the door and the rear wall of the wheel bay, such that it would not interfere with the landing gear leg, when it retracts. The length of the cylinder I have established by trial and error.



The small landing gear door has been mounted vertically and its retraction cylinder at the front of the wheel bay, as the wheel retracts to the rear of the wheel bay and leaves ample room there. Again the length has been determined trial and error. The location is selected such, that the cylinder cannot interfere with the large landing door when that closes.



However, on second thought a retraction cylinder for the large wheel door should not be needed. The wheel retracts 90 degrees sideways and about 20 degrees backwards, and is stored flush to the lower wing surface. So even when the door would be firmly

attached to the landing gear leg, it would travel the same way and would close flush to the wing surface. As a consequence I have removed the cylinder. As the door is now attached to the landing gear leg, it need not and cannot be hinged to the lower wing surface. In addition, its position relative to the wheel changes also, as shown in the pictures at the right, where a spare wheel and the other landing gear door have been used as model.



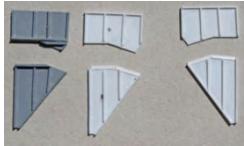
So I have removed the door from the landing gear leg and glued it in the correct position, which leads to a new conflict, when putting the aircraft in takeoff position: The sharp corner of the door will break off at the first hard landing.



So it is better to remove this corner before hand by changing the construction as

shown at the right.

As the “repair” was in my opinion not very elegant, I have decided to construct new wheel doors, using the modified old ones as a model. This gave me also the opportunity to get rid of the heavy beam at the lower edge of the doors, which in fact serves no structural



purpose. I have constructed the new wheel doors the same way as the old ones: a skin of 0.25 mm plastic sheet and strips of 0.25 x 0.4 mm. A new feature that I have added is a rabbet at the bottom of the large door, which will close first on retraction, and on which the small door should fit when closing afterwards.



I have glued the new wheel doors in place and have also made the hydraulic lines for the two retraction cylinders and the wheel brake. The lines are made from 0.25 mm metal wire painted middle grey. Forming the lines and adjusting their length was quite a job, but after many trial and error steps I managed to get them where and how I wanted them. All lines come together in the plate against the root wing rib. The thinner doors certainly are an improvement. To finish the wheel bays I have given them a yellowish wash and I have carefully sanded off the lower part of the wheels to give the model a more natural stand.



The soot deposit from the engine exhausts has been applied from my Tamiya weathering box. The picture also shows the navigation light under the fuselage, which I have made from 1 mm plastic rod rounded with sandpaper.



The nose wheel was a simpler affair. First I have glued the door to the left side of the wheel bay, such that the registration number can be read. I then have mounted the retraction cylinder from the front wall to about the middle of the door. I have only applied one hydraulic line; the one to the mounting point of the hydraulic cylinder would have been very short, and in addition is very difficult to reach. Also this wheel bay has been weathered a bit

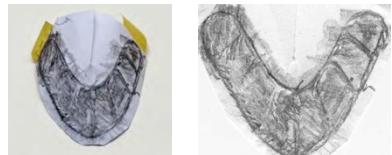


Cockpit and cabin windows

I was not satisfied with the quality of the cockpit windscreens. Not only it had quite some air bubbles, but also its transparency was bad and the window frame was quite crude. So I have decided to try to construct the windscreen from scratch.



First thing to do was to make a “print” of the existing windshield, which will use as a template for the size of the new windowpanes. I have selected 0.75 x 1.0 mm plastic profile to make the window frame; this corresponds to a real life dimension of 50 x 70 mm, which seems reasonable for a construction that has to withstand the pressure difference on altitude.



I have fitted the central post by trial and error and have glued it with Kristal Klear, which is sufficiently strong to keep the structure together, but can be

removed without leaving a trace, if the end result is not satisfactory.

I have made a copy of the foremost window from the "print" in Evergreen transparent styrene sheet and adjusted it such that it fitted well against the central post and was lying flush with the fuselage surface and fixed it temporarily with Kristal Klear in place. Next I have fitted



a post against it and glued it to the fuselage. When this had dried a bit I have removed the window and have repeated the procedure at the other side. I then have cut the next window from the transparent plastic, glued it temporarily in place and when the glue had dried, have cut the adjoining window post on size and glued it in place. I have repeated this process until all seven window posts were in place and had collected in the process three templates to cut the actual cockpit windows. The fourth template (for the rear most window) I had to cut to fit the remaining opening.

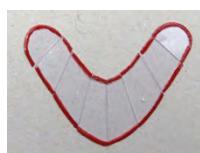


I was not very satisfied with the transparency of the windows; it seemed that the structure of the sheet material reflects very much grazing incident light, although the visibility straight through was quite good. So the final windows I have cut from the transparent cover sheet of a report, which has a smoother surface. Although I had been working with identical templates for the windows right and left, each individual window has been made to fit between the window posts.



Intermezzo

As a back up I have removed the window frame from the original windshield by sanding and have polished it with 1200 grade waterproof sandpaper and polishing medium. The plastic does not really get clear, but under water is looked quite transparent, so coating it with gloss varnish can repair this. The polishing brings the air bubbles clearly out (two bubbles even are open on both sides). I will primarily use the windshield as a mould to shape a new windshield, but if that does not work out, I may use the part itself. But the moulding exercise turned in an absolute disaster; I could not form the plastic sheet well over the original windshield, not even in two parts. Worse, the heat deformed the resin part, such that it even became unusable as a back up. I still don't master this technique.



I have given the window posts a coat of Humbrol 128 grey on all sides, the same colour as the cockpit interior walls. The outside surface of the posts I

have painted red, as I saw no reason to keep them blank aluminium, as suggested in the instruction sheet. This way the posts also were looking less massive than when they would have a different colour. The top and bottom of each windowpane has been painted grey before giving it the red overcoat. I have dry-fitted the first two windows produced this way, and they fitted very well.

I have glued the windows with Kristal Klear, and before gluing them I have given the red edge of all windows a coat of gloss varnish. This way it will be easier to clean the glue from the paint, if that is necessary, both in case of excess glue or if a window needs to be removed, because it is ill fitting. The picture at the right shows the result of the first assembly. At the place of the blue circles there was a mismatch, which needed to be corrected. So I have removed the

windows and sanded away the edge to achieve a better fit. As a consequence the window frame needed to be repainted also.



I have filled the gaps between the cockpit roof, the windows and the nose with white glue, applied in small quantities with a piece of metal wire and in several layers. The result was quite acceptable, but in some places (as can be seen in the picture) I had to

remove the excess glue with a sharp scalpel after it had dried. I have again repainted the places where I had applied the white glue with red and have finished the retouched spots and the window posts with satin varnish.

It seemed likely to me that a jet aircraft in the late 1940's would have window wipers on the windscreen, so I have modeled a pair of them from pieces of 0.13 mm plastic sheet and 0.20 mm metal wire, and painted them black. I have cut them to the correct length and glued them to the window frame above the front windows.



I have made the cabin windows with Microscale Kristal Klear. The area of the windows is rather large and the curvature of the fuselage did not make it easy to apply the Kristal Klear, as you have to swipe a tooth pick dipped in the white, thick fluid from edge to edge over the hole. Also, the risk of introducing air bubbles in the paste increases with the size of the windows, as happened with the last window in the picture at the left. These air bubbles become only visible, when the Kristal Klear has dried. If this happens, the window has to be removed after it has dried completely, and the exercise repeated. It is also essential to clean the excess Kristal



Klear around the windows as soon as possible with a slightly humid cotton stick; when it has dried only mechanical removal is possible, which generally damages the window again or, even worse, the model.

Control surfaces and navigation lights

I have added the elevator halves and rudder to the tail, gluing them with some drops of thick cyanoacrylate and fixing the elevator halves with a piece of tape. I have given the rudder a slight deflection and have made two holes of 0.3 mm in each of the trailing edges to mount the static discharge devices.



I have made static discharge devices for all control surfaces from 0.2 mm metal wire. Mounting them to the ailerons went quite easy, as I could drill 0.3 mm holes in the trailing edge. The elevator and the rudder, however, have very sharp trailing edges, excellent from the model point of view, which made it impossible to drill a hole at that place. So for the elevator I have made narrow, small grooves at the underside, in which I have glued the devices. This solution was not possible for the rudder, so there I have glued them really on the narrow trailing edge. They probably will drop off one or two times, but glue is patient.



I have painted the green and red navigation light on the wing tips with transparent paint (Humbrol 1325 and 1321 respectively). The red navigation light on the tip of the fin, on top of the fuselage I have made from rounded tips of 0.95 mm plastic rod, painted red

with transparent paint. As far as I know flashing anti-collision lights were not in use yet in the late forties'. To place the light solidly on top of the fin I have made a small recess in the thin edge of the surface.



I have glued the ailerons in place with three drops of thick cyanoacrylate, somewhat off-center to accentuate the model a bit more.

Antennae and pitot tubes

I have glued the ADF-antennae in place with a bit of thick cyanoacrylate, taking care that they were nicely horizontal. I have angled them sideways on the lower part of the engine compartment; this was the only



place where an unobstructed field of view could be achieved, as at the rear part of the fuselage they would have been exposed to the hot exhaust gases of the engines.

They are positioned such that they cannot touch the ground when the aircraft is rotating for take off. The antennae at the top of the fuselage have been glued in the holes I had drilled there. The wire antenna, leading from the second fitting to the fin and made of black painted 0.06 mm fishing line, I have attached only when all other details had been assembled.

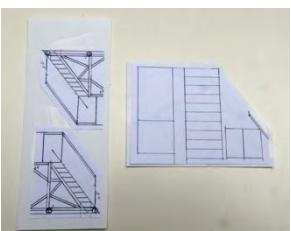


The pitot tubes, made of 0.3 x 0.1 mm brass tube, have been glued in a 0.3 mm pre-drilled hole in the wing tips.

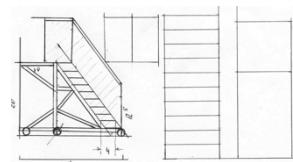


Passenger steps

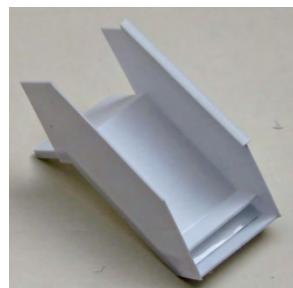
I found it rather unrealistic to model the aircraft with an open door, which is in reality more than two meters from the ground, so I have constructed a passenger steps. I have selected a model with solid sides, which was in use at the airports in the late forties and early fifties.



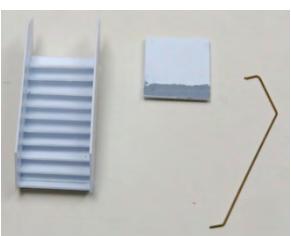
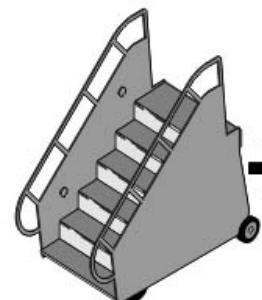
I have drawn a side view and the main parts, scaled them to 1:72 and glued a copy on 0.25 mm plastic sheet. I have cut out the parts, removed the plastic and have started to assemble the stairs.



I have used U-profile and strips of several dimensions to build the construction. The stairs have been glued with the very thin plastic cement of Tamiya, which flows out of itself in the joints. The wheels of the steps I have made from plastic tube.



Even although the lower part of the stair is a bit irregular, the result was rather convincing, and I have fitted the stairs against the Phantom. This was a deception; I had made an error in calculating the height (a matter of confusing 1:1 and 1:72 dimensions) and the wheels did not pass under the ADF antennae. So in fact, these steps only served as a prototype.



I have drawn a new side view, now with the correct dimensions and a slightly different configuration, more like a PE model for a DC3 I found on the Internet. I have also decreased the slope a bit to 45 degrees.



To place the steps easier I have engraved the place where they should be attached into the back panel first with a knife, then with a panel line scribe. This way it was very easy to get a regular pattern.

I have formed handrails from 0.5 mm brass wire. The construction of the steps is entirely composed out of 0.5 mm plastic sheet, 1 x 1 mm U-profile strip and 1 x 0.75 mm flat strip, with wheel made of 4 mm tube and 1.8 mm plastic rod. Especially the U-profile is very handy to make a sturdy construction and even helped to create a sliding construction for the parts of the sides of the steps that have to be slid against the aircraft fuselage wall.



Next came (again a fit check of the steps with the Phantom. Now the steps appeared to be a bit too high, so it interfered with the underside of the door, but at least interference with the ADF antennae was not possible any more thanks to the modified support of the top platform.



I have corrected the mismatch by removing the last part of the top platform and placing it a millimeter lower. I have also reinforced the attachment of the handrail; to the steps with small pieces of 0.5 mm brass rod.

I have applied a coat of primer to the steps and finished it with white paint. The steps have been modeled as Fokker Company ground equipment, specifically adapted to the F.26 and I have drawn and printed a decal with the official Fokker name (N.V. Nederlandsche Vliegt. Fabriek Fokker) as it appeared on formal documentation of that time. The layout I have taken from the picture at the right.



N.V. NEDERLANDSCHE VLIETKAMP VALKENBURG
N.V. NEDERLANDSCHE VLIETKAMP VALKENBURG

KLM KLM

The KLM letters will go on another model passenger steps, used by the company in the late forties' and early fifties'. This PE kit has been produced by Aircraft in Miniature to go with the De Havilland Comet. I still have to check, whether the height fits also the Phantom.



Summary

The resin parts in the kit are of good quality, but require a lot of cleaning before they can be assembled, and the fitting of fuselage, wings and engine compartment is rather bad. The fuselage wall is rather thick, and thinning is difficult and lead to a poor fit of the cabin interior, so I have decided not to do this. There is a major discrepancy between the undercarriage configuration in the kit and the one shown in the official Fokker drawing of the F.26; correcting this is a major effort. The clear resin parts for the windshield and some for the cabin windows showed many air bubbles and their transparency is poor. Model surfaces show no panel lines. This is a pity, because it would give the model a more realistic appearance; it is, however, rather easy to add them with a scriber, using the original Fokker drawing as a guideline. The same applies for the decal set; some more detail would have been appreciated⁷. The kit is expensive, in Europe driven further up by rather high VAT and customs rights (more than 35% of the US price).

Having said all this: the IRMA model of the Fokker F.26 Phantom is an outright unique kit and a joy to build for the experienced modeler. What I have liked very much is the combination of building this model and the investigations into the very scarce information available to reconstruct a realistic rendering of this ambitious Fokker project of 1946, which never has flown. Below some pictures of the completed model are shown.









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Appendix Documentation of the Fokker F.26 Phantom

Modifications & corrections

M = modification, C = correction

Change	Location/part	Modification or correction
M01	Cabin	Construct forward and rear cabin walls
M02	Cabin	Remove mounting spot for last left hand seat
M03	Cabin	Make seat belts
M04	Cabin	Make windows with Kristal Klear
M05	Cockpit	Remove cockpit door and make open rear door on back of cockpit wall
M06	Cockpit	Add throttle handles
M07	Cockpit	Make seat belts
C01	Cockpit	Make new windshield
M08	Cockpit	Make window wipers
M09	Control surfaces	Produce fairing for trim surface push-pull rods
M10	Control surfaces	Make anti static devices
C02	Engine assembly	Make provision for balance mass
C03	Engine assembly	Remove center cones
M11	Engine assembly	Deepen inlet and exhaust holes
M12	Fuselage mid section	Engrave panel lines at floor level and above windows end along cross sections
C04	Fuselage mid section	Remove forward part of floor to accommodate balance weight
C05	Fuselage nose section	Fill old nose wheel bay with lead
C06	Fuselage nose section/engine assembly	Remove nose wheel bay; construct new wheel bay between the engines.
C07	Fuselage/wing/ engine compartment	Make cavities before center of gravity and add lead; remove material from tail inside ⁸

Change	Location/part	Modification or correction
M13	Fuselage/ engine assembly	Produce "danger", emergency exits, door instructions and other small decals
M14	Fuselage	Red navigation light on top of fuselage and under fuselage
M15	Fuselage	Antennae on top of fuselage
M16	Fuselage	ADF antennae under fuselage
M17	Fuselage	Make new registration numbers, emergency exits, engine hatches, power inlet
M18	Fuselage	Make window in open passenger door and detail
C08	Tail	Replace resin pin of fin and stabilizer by plastic pins
M19	Tail	Remove elevator and rudder
M20	Tail	Engrave trim surfaces in rudder and elevator halves
M21	Tail	Red navigation light on top of fin
C09	Undercarriage	Construct new nose wheel landing gear leg
C10	Undercarriage	Move main landing gear leg position to main wing spar
C11	Undercarriage	Construct new main landing gear legs
M22	Undercarriage	Make landing light on nose wheel leg
M23	Undercarriage	Make hydraulic lines in wheel bays
C12	Wing	Reconstruct main wheel bays taking into account position of stowed wheels
C13	Wing	Construct new landing gear doors
C14	Wing	Make provision for balance mass; remove resin.
M24	Wing	Cut ailerons loose
M25	Wing	Engrave panel lines at location of de-icing boots, main and rear spar, inner and outer wing root
M26	Wing	Engrave trim surface in left aileron

<i>Change</i>	<i>Location/part</i>	<i>Modification or correction</i>
M27	Wing	Produce "no step" area and registration number decals
M28	Wing	Landing lights in outer wing roots
M29	Wing	Green and red navigation light on wing tips
M30	Wing	Make pitot tubes
M31	--	Make passenger stairs

Paint table

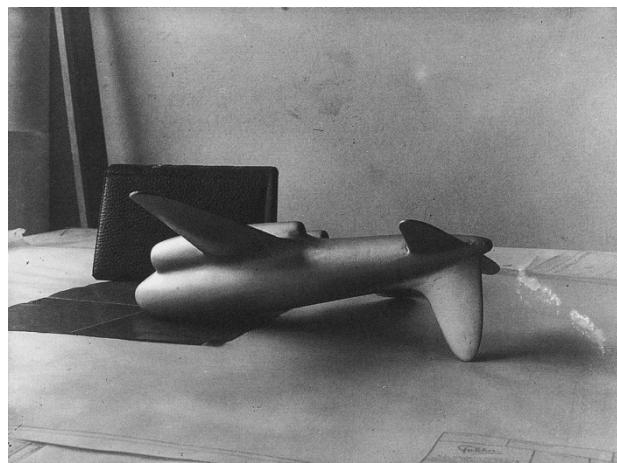
H = Humbrol, V = Valejo

<i>Code</i>	<i>Colour</i>	<i>Where</i>
H15	Dark blue	Seat covers
H22	White	Top fuselage
H33	Black	Arm rests; inside engine intake and exhaust casings
H53	Gun metal	Engine exhausts; underside fuselage above engine exhausts
H85	Coal black	Deicing boots
H125	Dark grey	Instrument panel and controls; seat frames; landing gear legs; fixed part of hydraulic cylinders and lines
H128	Mid grey	Cockpit walls and floor
H144	Grey blue	Cabin floor
H166	Light grey	Cabin walls
H127	Light grey	Wheel bays
V71.062	Aluminium	Lower fuselage; wings; engine assembly; wheel hubs and brakes; moving part of hydraulic cylinders
H--	50/50 H100/ H153 drop H68	Avio-Diepen-red ;cheat line and nose section

[Source: Hooftman, ref. 7]



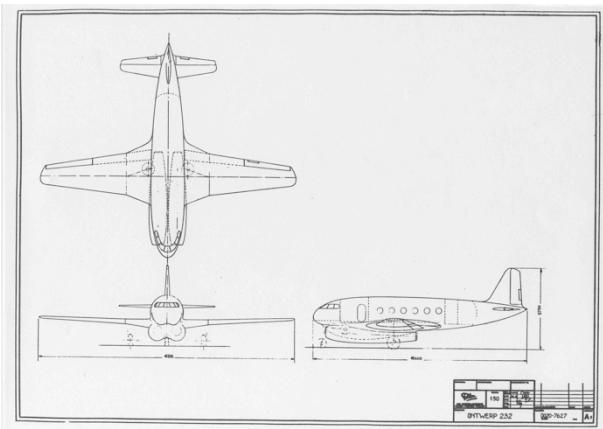
[Source: Braas, ref. 8; Vredeling, ref. 9 (original)]



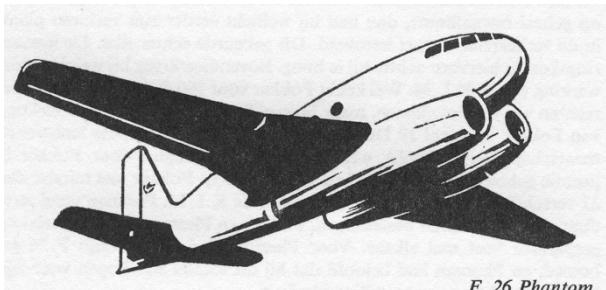
[Source: Troost, ref. 4]

Drawings and photographs

When no source is mentioned, the illustrations originate from the model documentation.



[Source: Vredeling, ref. 9]



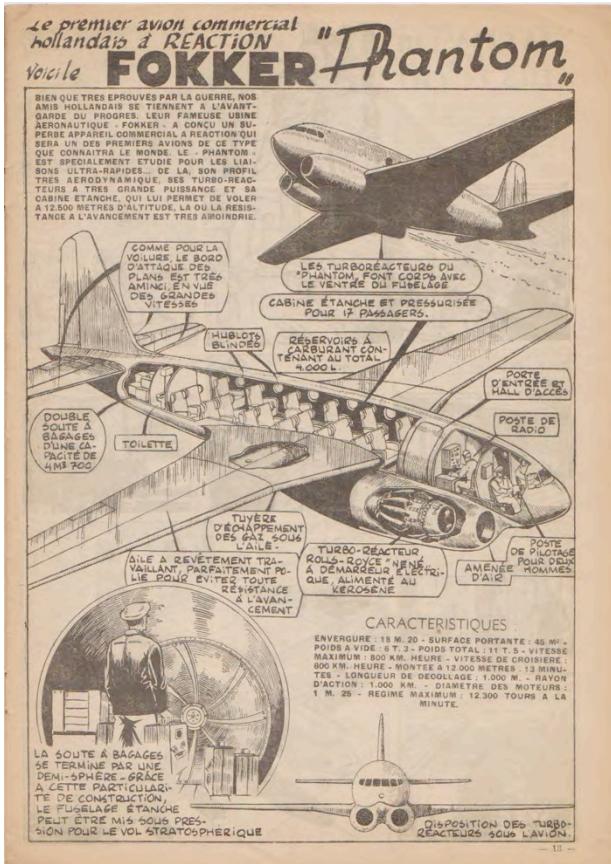
F. 26 Phantom.



[Source: Vredeling, ref. 9]

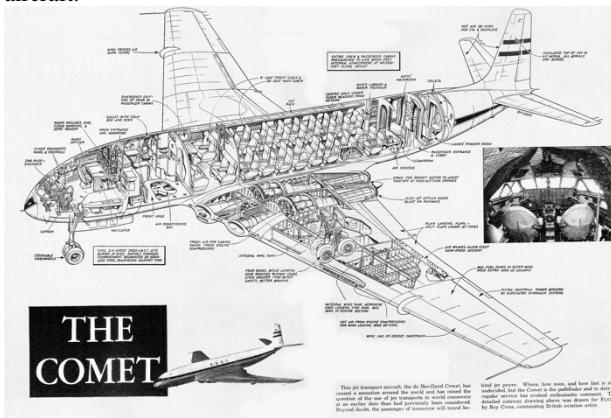


[Source: www.quirao.com]



[Source: Spirou, 1949; via Zane Nobbs]

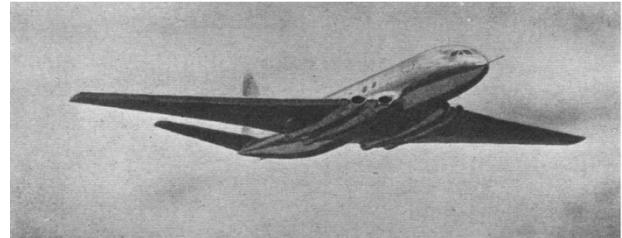
I have used a number of pictures of the De Havilland Comet, which was a contemporary design, as reference to get an idea of the detailed configuration the early jet propelled passenger aircraft.



[Source: aero-links.net]



[Source: www.aviationexplorer.com]



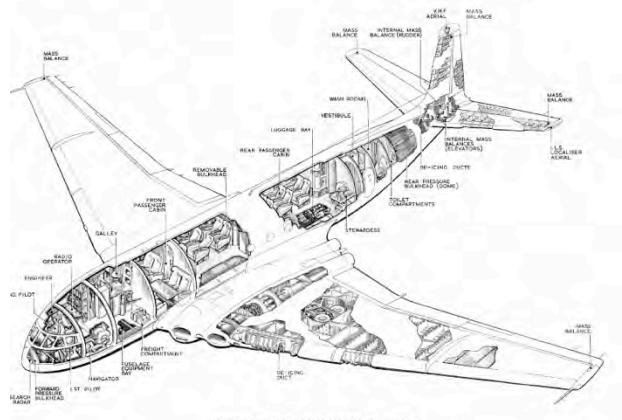
[Source: Flight]



[Source: <http://plane-crazy.k-hosting.co.uk/Aircraft/Jets/Comet/comet.htm>]



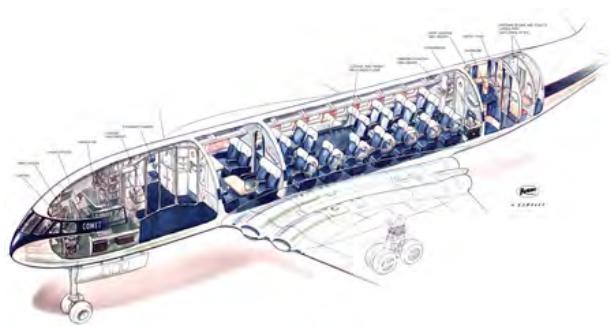
[Source: www.flightglobal.com; Comet 4]



[Source: <http://67.69.104.76:84/marville/photos/planes/comet-9.jpg>; Comet 1a]



[Source: airliners.net]



[Source: www.flightglobal.com]

¹ www.internationalresinmodellers.com

² Late in the building process I have received from Zane Nobbs, the president of IRMA, a cut away drawing of the Phantom, which appeared in the Spirou comic magazine in 1949.

³ According to original Fokker documentation.

⁴ This may have been the reason for the model designer to position the main landing gear legs more backwards.

⁵ The final version of the decal sheet contains also three very small F 26 texts to serve as a back up when the original Fokker logo decals get destroyed during application.

⁶ Diepen was active in aircraft parts trade and air taxi exploitation and later became commercial director of the Fokker aircraft factory. He also developed his own planes under the name Difoga. Two prototypes have been constructed, but never went into production.

⁷ It is however quite easy to draw and print some decals yourself; when sticking to the main finishing colours white and aluminium quite a lot can be achieved with simple decals on transparent decal paper.

⁸ Bringing the center of gravity forward allows for the move of the main landing forward.