Fokker 50 Welsh Models[1] vacuum-resin kit

Monoplane passenger

Scale 1:144

The Fokker 50 was a continuing development of the Fokker F.27 Friendship turboprop. In the early 1980's a re-engined F.27 was studied, the F27RE, but market surveys showed that such a version had insufficient potential. This led to a new design: Project P335, the later Fokker 50.

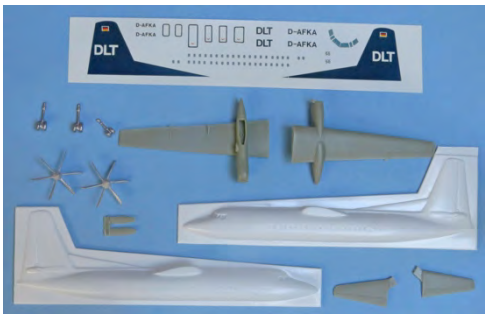
The aircraft had two Pratt & Witney Canada PW127B engines of 2250 hp (2500 hp in emergency conditions) with a six blade propeller, reducing the fuel consumption with 30% and giving a 6db lower noise level than the F.27. More composite material was used in the construction, also in the primary structure, while the wing was refined aerodynamically. The pneumatic system for undercarriage and flaps was replaced by a hydraulic system, while the cockpit was modernized amongst others with an Electronic Flight Instruments System. Also the cabin arrangement was modified; the passenger door moved to the front and had a stairs incorporated, and both in front and at the back of the cabin there were doors at the left and right, dispensing with the need for emergency hatches. The large, oval F.27 windows were replaced by a larger number of smaller, square windows. As with the F.27 several other companies were involved in building the Fokker 50: Dassault-Breguet, SABCA, MBB (DASA) and Fuji Heavy Industries.

Two prototypes have been constructed. The first flight took place in December 1985, and the first deliveries began in August 1987 to DLT. The Fokker 50 has been developed further into the three meters longer Fokker 60 with accommodation for 68 passengers.

The production has been ended in 1996 by the bankruptcy of Fokker. At the end of the program 213 aircraft had been built and 10 year later still 171 Fokker 50's were operated. The Fokker 50 was no commercial success; it was an excellent aircraft with low operating cost, but too expensive a buy. The qualitatively worse ATR was so much cheaper that the Fokker 50 was doomed to lose the battle.

The kit comes in a sturdy carton box and contains a vacform fuselage, six resin parts for wings, horizontal tail plane and undercarriage doors, five white metal parts for the propellers and the landing gear, a decal sheet for the DLT aircraft, which I am going to build, and an A4 sheet with building instructions.

The instruction sheet is rather simple and addresses two possible versions: one using the decal for the windows provided and one with windows openings cut out and windows made with Microscale Kristal Klear.



The vacform part is of good quality and quite stiff. The moulded panel lines are, however, rather undeep and need to be scribed again. The resin parts are finely modeled.

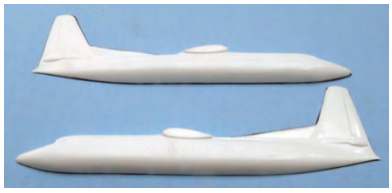
I have decided to build the model in the version as delivered to one of the launching customers, the German company DLT (Deutsche Luftverkehrsgesellschaft mbH, now Lufthansa CityLine GmbH), for which the decals are supplied with the kit.

Ref. 1, 5 and 8 report the dimensions of the Fokker 50.

	Ref.	*1:144*	*model*
Span	29.00 m	201.4 mm	192.0 mm
Length	25.19 m	174.9 mm	172.1 mm
Height	8.32 m	57.8 mm	59.0 mm
Engine	Pratt & Witney Canada PW127B (2 x 2250 hp)		
Crew/passengers	4/58		

The span of the model is almost 5% too small; length and height are about all right.

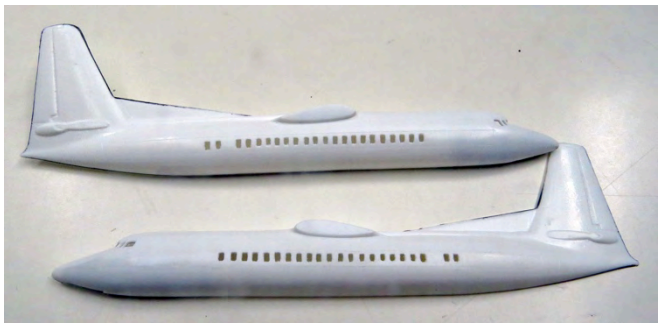
Fuselage



I have drawn the outline around the two fuselage halves, cut them out with scissors and knife and have sanded them on coarse and fine sanding paper glued on a flat surface until the edges came loose. To get a solid connection between wings and fuselage I will mount them with a pin-hole connection, and in anticipation with that I have reinforced the inside of the wing centre section with some pieces of plastic strip. I have also filled the nose section of both fuselage halves with fishing leads, fixed with white glue.

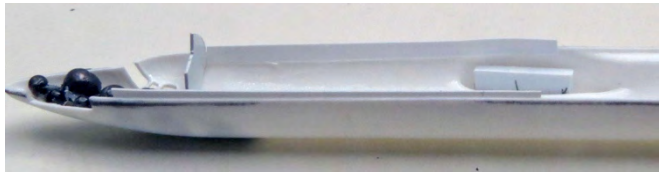
According to the instruction sheet the cabin windows have to be removed in the standard way: drilling a hole in the middle and filing the material away until no engraving of the window outline is visible any more. With the help of my smallest set of files I managed to do so. It was a time consuming job with more than 40 windows to do[2].

I have also cut open the cockpit windows, again by first drilling holes, connecting the holes with a knife (if necessary), removing the material by filing and finishing the window carefully with a knife.



Finishing the 44 cabin windows was a tedious job, which I have spread over quite some days. I have deepened the lengthwise panel lines, using Dymo tape and electricians tape as guidance, and I have removed the nose wheel doors from the fuselage and have glued a piece of 0.5 mm plastic in the opening. New doors will be made from 0.25 mm plastic.

To limit the view through the cockpit to the cabin I have constructed a partial bulkhead. I had to make the cut-out at the left side to accommodate the lead balance mass, which were glued in the nose already.



To fit the fuselage halves together I have glued 0.2 mm plastic strips along the joints and I have painted the inside of the fuselage dark grey.

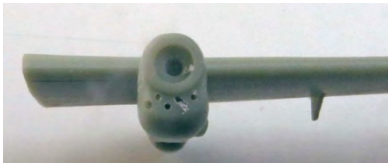
However, dry-fitting the fuselage together, the joints showed up very ugly. This was caused by a difference in thickness of the plastic of the fuselage halves. So I have re-

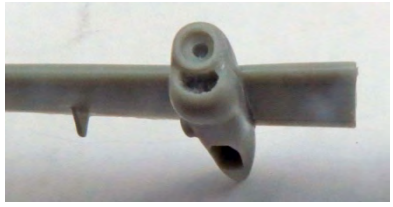
moved the strips again and have glued both halves together, adjusting their position as well as possible to minimize the required sanding and putty effort. Still, quite some work was required to get an acceptable appearance. The fuselage cross-section gives the right impression, but the model is missing the characteristic bend at the place of the cabin floor. However, I am not going to make on this scale the repair I have done for the F.27 MPA; I will leave it as is.

As can be seen on the pictures, I have masked the vertical panel lines with electricians tape to engrave them a bit better. This method works quite well; the tape follows the curved lines well and when no sideways pressure is applied to it guides the tool reliably.

Engines

The resin wings-engine parts are quite well modeled and I could find only one air bubble. The detailing of the cowlings is limited; I have deepened the exhausts with a 1.5 mm drill slanted forward and have opened up the inlets, starting with five 0.5 mm holes drilled at the outline of the inlets and increasing the drill diameter with 0.2 mm steps to finally 1.2 mm, after which the remaining material could be removed with a scalpel.



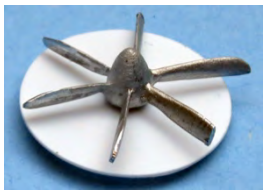


The air bubble was on a rather inconvenient place, but the damage could be repaired with Revell putty. I have also made some air scoops with slivers of plastic rod.

As there were some doubts on the correct size of the propellers, the location of the engines and the position of propellers relative to the fuselage, I have measured the model and have compared it with scaled dimensions in drawings. Some results:

	Model [mm]	*Drawing [mm]*	*Remarks*
Width of the fuselage	17.7	18.2	< 3%, OK
Distance fuselage center line – propeller axis	24.0	25.0	4 %, OK
Diameter propeller	30.1	25.4	19%, not OK; blades 2.5 mm too long

Although the blades would leave the fuselage just free, I will have to shorten the propeller blades to get a realistic appearance of the model. I have made a template of the correct diameter to guide the modification. I have first shortened the blades and then have filed them in the correct profile. I had to keep the blade being worked on clamped in a pair of tweezers to prevent deforming it, when exerting force. For both propellers I have left one blade in the original size to copy the form to the other five blades, and have corrected that blade afterwards.



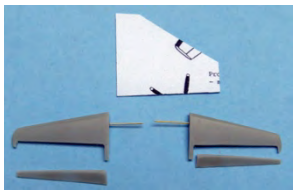
I have found one picture showing clearly the finish of the propellers of the Fokker 50 with the registration D-AFKA of the decals in the kit. It also shows quite some useful detail

for finishing the nacelles and the landing gear. It is remarkable that the Fokker 50 logo is placed here on the nacelle, while the other pictures of the DLT Fokker 50s show it next to the forward cabin windows. Anyhow, I have painted the blades of the propellers black, the tips yellow and the spinner mid grey.

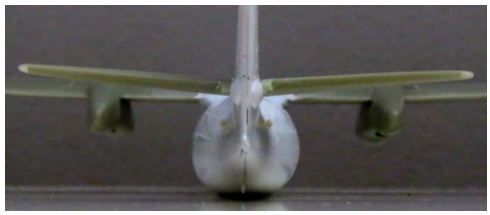
I have painted the exhausts metallic black and the part of the nacelle behind the exhausts chrome. I have produced the nose wheel landing gear doors and the small door on the forward main landing gear strut from 0.5 mm plastic sheet. The wheel bays and the inner side of the landing gear doors has been painted light grey, the outside white.

Assembly of wing and tail

I have glued the wings to the fuselage, taking care that the distance between wing tips and top of the fin was equal on both sides. All joints have been treated with putty and sanded flush.



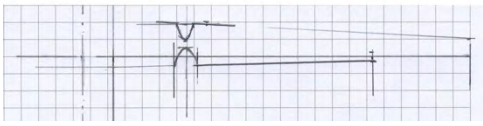
After separating the elevator halves from the stabilizer, I have also attached these also with a pin-hole connection to the fuselage. I have made a copy of the front view to serve as a template to mount the stabilizer halves at the correct angle to the fin. Also, I have made two small exhausts for the aft fuselage from 1.0 mm rod with a 0.5 mm hole drilled in it. To fit them to the fuselage the rod has been cut skewed and flattened on the outside to give a correct impression. The bump fitting under the fuselage has been made from 0.5 mm sheet material.

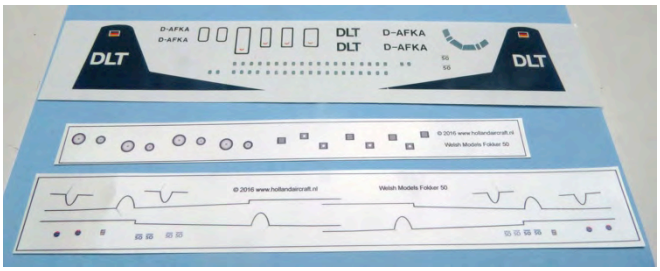


Painting and decals

The decals in the kit are of mediocre image quality, and I was glad I had decided to make “real” windows. The tail decal has to be reworked to leave the fin leading edge exposed and the “Fokker 50” logo is of poor quality. I have redrawn it with the aid of some logos copied from the Internet. As the scale of the model is too small to model “real” landing lights in the wing leading edge, I have also drawn some black squares with a white circle in it representing these. Together with some wheel hub drawings they have been printed on white decal paper.

I have found a picture showing an ex-KLM City Hopper from above, where the walk lines were well visible. I have measured the wing of the model, and have drawn the pattern on paper. Mounting this drawing in CorelDraw I have copied the lines with rectangles and ellipses to generate the decals. I have also copied some Fokker logos of 1.7 mm high, which were present on the aft fuselage of the LTU Fokker 50s and the panel next to operate the passenger door/stairs. The triangles in the drawing are an artifact, created when the elliptic shapes were drawn; in the print it is hardly visible, and can be easily cut off from the rest of the decal. In the actual decal I have doubled the number of objects to have some spares. The picture shows the original decal set at the top, the white decal set in the middle and the clear decal set at the bottom.





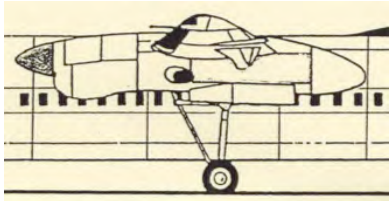
I have glued the elevator halves to the tail surfaces in a downward deflected position (the parking position) and have sprayed the model with white primer from a can. Of course some joints had not been treated well enough and showed up again. So another round of putty-and-sanding was necessary. Before spraying I have emphasized the panel lines on top of the wing.

However, I was not very successful with spraying from the can; either the layer was too thick, and started to drip at some spots, or it was too thin, leaving areas almost bare. I found this impossible to control well. So I have cleaned all paint off. Also there still showed some defects in the joint finish, so I profited of the occasion to give them a last treatment with Mr. Surfacer 1200. After a thorough wet sanding of the model with 1200 grain sanding paper, I have started to airbrush the model, using the white primer of Vallejo. The primer covered reasonably well after two layers, but clogged up the airbrush quite frequently. Varying the air pressure, the thickness of the paint and the amount of flowing medium did not alleviate this problem. So in the end I have decided to apply the gloss paint white paint of Vallejo with a brush.

I have thinned the paint with water in a ratio 5:2. This worked quite well, and after four layers an even coat has been achieved. Before applying the final layer I have also glued the antenna, made from a piece of 0.4 mm plastic sheet, on top of the fuselage. Painting the deicing boots was difficult. Even when very careful applying the masking tape, the black Humbrol 31 paint managed to escape under the tape. I had to clean the paint locally before drying completely with a micro brush dipped in white spirit.

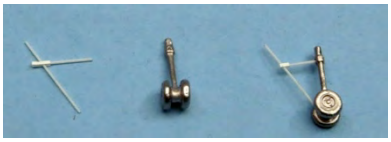
Undercarriage

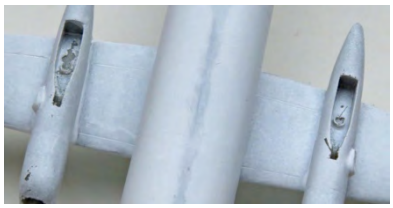
The white metal undercarriage in the kit is very simple, the two wheels and the main landing gear leg, and also needs a lot of cleaning. The diameter of the wheels is to scale, but the correct configuration is not modeled. I have cut some pieces of 0.5 mm plastic rod, one to form the forward strut and one for the horizontal one, modeled a fork at the end of this last one from small pieces of 0.13 mm sheet material.



I have built the landing gear leg over a copy of the side view of the instruction sheet. To connect the horizontal strut better to the white metal main leg I have dilled a 0.5 mm superficial hole in the “ring” at the top.

To accommodate the forward strut in the nacelle I have made a forward extension to the wheel bays. I also had to move the main leg slightly backwards by eliminating the rear part of the ring moulded for the main leg to obtain a correct appearance of the extended leg.



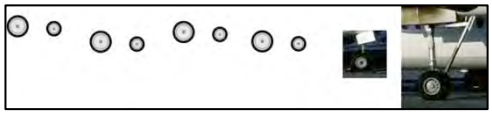


The proportions of the landing gear relative to the size of the wheel bays does not seem accurate; they white metal part seems far to large. Measurements in mm on hardware and on drawings are shown in the table. Conclusions are:

- Gear width of both wheels is too large.
- The main wheel diameter is correct, the nose wheel is a bit too big.
- The tires of both wheels are too large.
- The width between the wheels is correct.

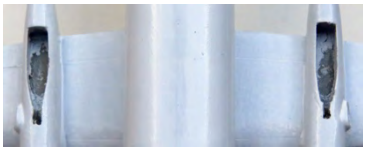
	Parameter	*Main landing gear*	*Nose wheel gear*
drawing	Wheel diameter	6.0	4.4
	Rim	3.7	2.6
	Hub	2.4	1.5
	Gear width	4.8	3.9
	Tire width	1.5	1.2
	Width between wheels	1.8	1.5
model	Wheel diameter	5.8	4.7
	Gear width	5.45	4.85
	Tire width	1.86	1.64
	Width between wheels	1.73	1.57

So it seems the leg of both gears can be used, but new, narrower wheels need to be constructed. I have made each wheel from three plastic discs, sanded to the correct thickness with rounded edges and a hollow in the middle made with the point of a large diameter drill bit.



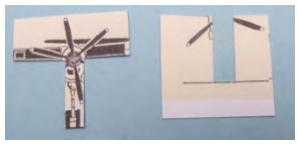
Rims, hubs and other details have been made as decals, where I have corrected the relative dimensions by means of a scaled photograph. The decals will be printed on white decal paper, and the black edge will fuse with the black painted tires. The photograph also illustrates the “split” nose wheel doors, of which the forward part is only opened during extension or retraction.

I have dry fitted a main leg in a nacelle and measured the distance between the underside of the tire and the underside of the wing and have compared that with the scale drawing. The leg appeared to be 2 mm short, so I have lengthened the leg with a sleeve made from a piece of 3 mm plastic tube of which I have widened the inner diameter to 1.6 mm and I have removed the socket in the nacelle.



Next I have removed the forward and horizontal strut from the leg, which went easy thanks to the cyanoacrylate joint, and have sawed the white metal wheel off. I have glued the new wheels to it, but now the width of the landing gear appeared to be almost 1 mm too narrow; I had forgotten that sawing removes quite some material. I have taken off the wheel and have glued a 2.5 mm disc of 0.4 mm plastic on both wheels and glued them again to the leg. I have also fitted a copy of the hub decal to it, and the proportions seem all right. For the nose wheel I have fitted 0.2 mm thick plastic discs to each wheel. The wheels have been painted grey and the tires black, the leg and forward strut Vallejo steel.

To fit the main undercarriage legs under the model I have made a small jig cut from a carton copy of the front view in the instruction sheet on which the span is well to scale (contrary to the model itself). Here it appeared that the nacelles were located too close to the fuselage, so it seems that the whole wing has “shrunk” span wise. By means of the template I have adjusted the length of each leg, marking the left and right leg.

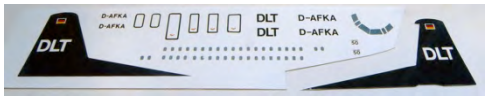


I have cut out the decals for the wheel hubs and have positioned them on the wheel, treating them amply with Set and Sol. The wheels have been finished with a coat of Vallejo satin varnish.

Final assembly

As the landing gear is rather fragile, I have postponed its assembly into the model until later, and have first made the windows by filling the openings in the fuselage with Microscale Kristal Klear. Removing the excess Kristal Klear with damp cotton sticks was not very easy, as the many windows are very close to each other[3]. With the help of a Modelbrouwers microbrush I managed to clean away most.

Next I have applied the decals, which are printed with a continuous transparent film, and have started with those on the fin. The decals in the kit did not take into account the fin has a de-icing boot on the leading edge, so I have measured its position, marked it on the decal and have cut the excess material away with a sharp scalpel. The decals are rather stiff, but are well compatible with Microscale Sol, and three treatments helped to fold it around the edges and made appear at least a bit the rudder outline. Panel lines, which are anyhow not very sharp in vacform technique, do not show up. Also, while dry-fitting the decal, it seems to interfere with the stabilizer. Initially I have made a cut out to avoid that, but after application this appeared to be incorrect, so I had to repair it with a sliver of leftovers.



Notwithstanding the special “treatment” the fin decals have two other shortcomings: They are slightly transparent, so any overlap is a grade darker than the decal on a white basis. Also, there are some misprints and minor mismatches, which show up as white spots, and the decal is not high enough, leaving the top of the fin uncovered. To repair this last defect I have used part of the blue left over removed for the de-icing boot; the other defects

have been retouched with a bit of paint (Humbrol 15). The colour difference between paint and decal is hardly visible.

I have sealed the dark blue decal with Vallejo satin varnish, but the decal stayed very matt. So I have redone the work with gloss varnish, which yielded a more acceptable result.

Next I have applied the decals for doors, registration and logos on fuselage and nacelles. I have determined the correct locations by means of drawings and photographs; the instruction sheet does not contain sufficient information for this. I have used the darker and bolder version of the FOKKER 50 logo. The small very small logo decals were difficult to apply in a normal way. I have cut them carefully as close to the image as possible (and have lost a Fokker logo in the process), put them in a drop of water on the cutting mat, taken them off the backing paper with fine pointed tweezers and landed them in a small drop of Set at their destination. After adjusting the position I have removed the excess fluid with a piece of tissue. I found it surprising that the 0.15 high print on the door control panel decal is still readable under a magnifying glass.

I have cut out the walk lines as closed as possible to the black line and positioned them on the wing with ample Set, excess of which has been removed with a piece of tissue. I had overlooked that there is still a small curve in front of the wing; for this I have sacrificed one of the spare decals on the forward part of the nacelle. Also, the straight walking line between the two de-icing boots and the wing tips is made from pieces of spare decal material, as well as the lines next to the “foklets”. Unfortunately I discovered too late, that the end of the port de-icing boot ended too far from the wing tip, so the walk lines are now slightly asymmetrical.

I did not apply the registration on top of the right wing, as suggested by the instruction sheet; I could not find any picture of DLT Fokker 50s having a registration on that place (and European “rules” do not prescribe it, I learned from a fellow modeler).

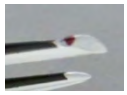
The small decals representing the landing lights have been mounted on the leading edge of the outboard wings. As they are printed on white decal paper, they were rather stiff, but with some gentle pressure they adhered well.

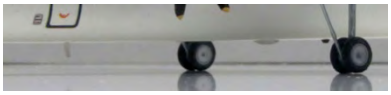
I have glued the main landing gear legs in the nacelles. As a consequence of the misalignment of the wings relative to the fuselage, I had to place the leg against the outside of the wheel bays to get the correct alignment of the wheels. I have shortened the leg of the nose wheel according to the drawing on the instruction sheet and have glued it in a 1.2 mm hole I had drilled in the nose wheel bay.

The main landing gear and nose wheel doors have been glued in place, including the small doors on the main landing gear forward strut, made from 0.25 mm plastic sheet.

I have made the fairing for the trim actuation mechanism from a piece of 1 x 1 mm plastic strip, of which the rear part has been painted dark blue, the forward part white, as it is “mounted” over the *T* of the DLT logo on the tail.

The antenna under the fuselage again has been made from a sliver of plastic cut and sanded in the correct shape. Pictures show that the antenna is not placed centrally under the fuselage, but slightly offset to the starboard side. The antennae on the fin have been cut from 0.25 mm plastic sheet and have been fixed in place with a drop of thin cyanoacrylate glue.





I have given the place on the wing tips where the navigation lights are located a coat of Vallejo silver and have applied several coats of Humbrol transparent red

and green on top. The red lights on top of and under the fuselage have been made from pieces of 1 mm half round strip, painted transparent red. I have also shaped the dome for the ADF antenna under the fuselage from a piece of left over plastic.

The antenna on the fin have been made from pieces of 0.25 mm plastic; the fairing for the rudder trim mechanism from a piece of 1 x 1 mm strip.

I have redone the front cockpit windows, removing the old Kristal Klear, painting the window edges black and making new windows with Kristal Klear, letting the model dry in a nose down position. I have glued the propellers in place and have dirtied the metal panels behind the engine exhaust with soot.

Summary

The model is easy to build in itself, but inaccuracies in the kit require quite some correction, and make it a challenge. Most disturbing are the propellers that have too large a diameter, the wheels that are too wide and the “skewed” wings. I have not corrected this last defect. I have also not corrected the span, which is 10 mm too small. The decals were of mediocre quality; there is no choice of after-market sets. The overall impression of the modified model is, however, correct.


DLT
AFKA


DLT
D-AFKA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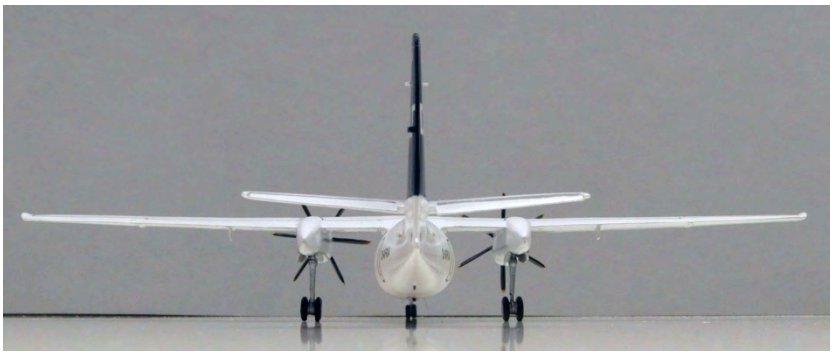
DLT
D-AFKA




DLT
D-AFKA

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Appendix Model modifications and corrections; pictures, drawings and other documentation of the Fokker 50

Modifications & corrections

M = modification, C = correction

Change	*Location/part*	*Modification or correction*
M01	Fuselage	Wing root reinforcement
M02	Fuselage	Nose wheel bay & doors
M03	Fuselage	Cockpit-cabin bulkhead
M04	Fuselage	Cabin & cockpit windows cut out and filled with Kristal Klear
M05	Fuselage	Antennae on top of and under fuselage
M06	Fuselage	Fokker logo on tail cone
M07	Fuselage	Door controls next to passenger door
M08	Fuselage	Navigation light on top

Change	*Location/part*	*Modification or correction*
M09	Engine	Exhaust deepened
M10	Engine	Inlet opened up
M11	Engine	Scoops on cowlings
C01	Engine	Propeller diameter decreased
C02	Engine	Wheel bay extended forward
C03	Engine	Fokker 50 logos on nacelle
M12	Tail	Elevator halves separated and mounted deflected downwards
M13	Tail	Antenna on fin
C04	Undercarriage	Length and position of main legs
C05	Undercarriage	Corrected wheel thickness
M14	Undercarriage	Forward and horizontal struts
M15	Undercarriage	Decals for wheel hubs
M16	Undercarriage	Small wheel doors on forward

Change	*Location/part*	*Modification or correction*
		landing gear strut
M17	Undercarriage	Nose wheel doors
M19	Wing	Pin-hole connection to fuselage
M20	Wing	Walk lines
C06	Wing	Registration on top of wing deleted

Paint table

H = Humbrol, V = Vallejo

Code	*Colour*	*Where*
H7	Yellow (light buff)	Propellers tips
H15	Midnight blue	Retouch & antennae fin
H85	Black	Wing, stabilizer & fin leading edge, propellers, engine inlets, tires
H125	Dark grey	Cabin & cockpit interior
H128	Mid grey	Spinners, wheel bays and inside of wheel doors
H1321	Transparent red	Navigation lights
H1325	Transparent green	Navigation lights
V70.842	White	All aircraft
V71.063	Silver	Undercoat of navigation lights
V71.064	Chrome	Outboard mid part of nacelles
V71.065	Steel	Landing gear legs and struts
V71.073	Black metallic	Exhausts

Photographs and drawings

If no source is mentioned, the documents have been taken from the Internet.

[Source Wikimedia Commons]

[Source: Wikimedia Commons]

[Source: www.dutch-aviation.nl]

[Source: Luc Barry; www.planepictures.net]

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[Source: www.airliners.net]

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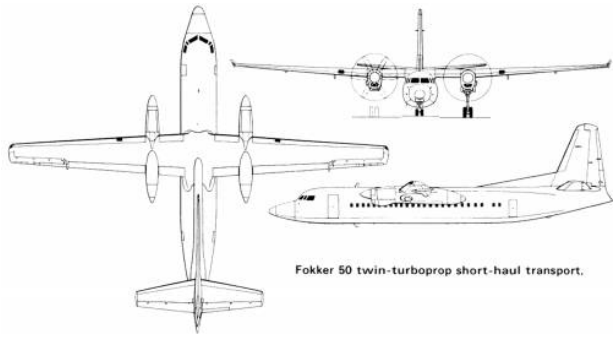
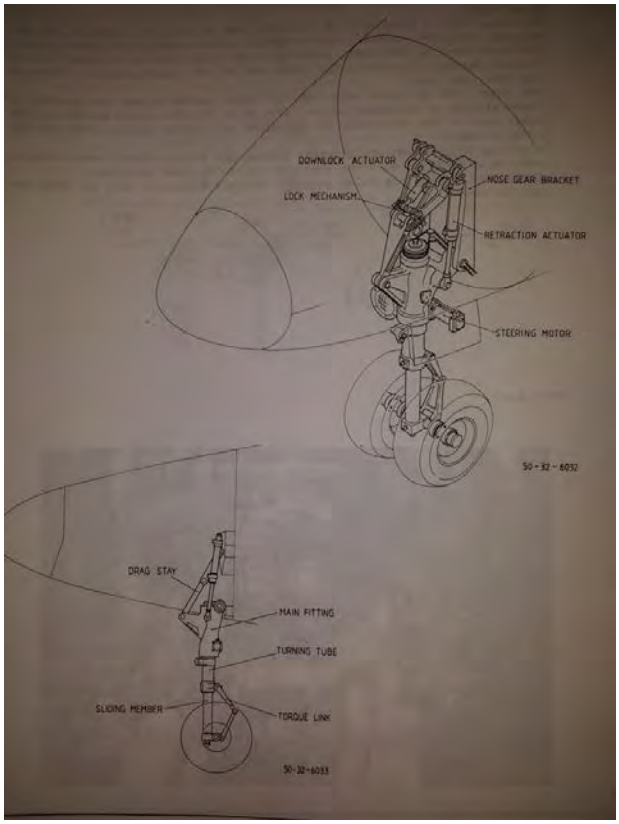
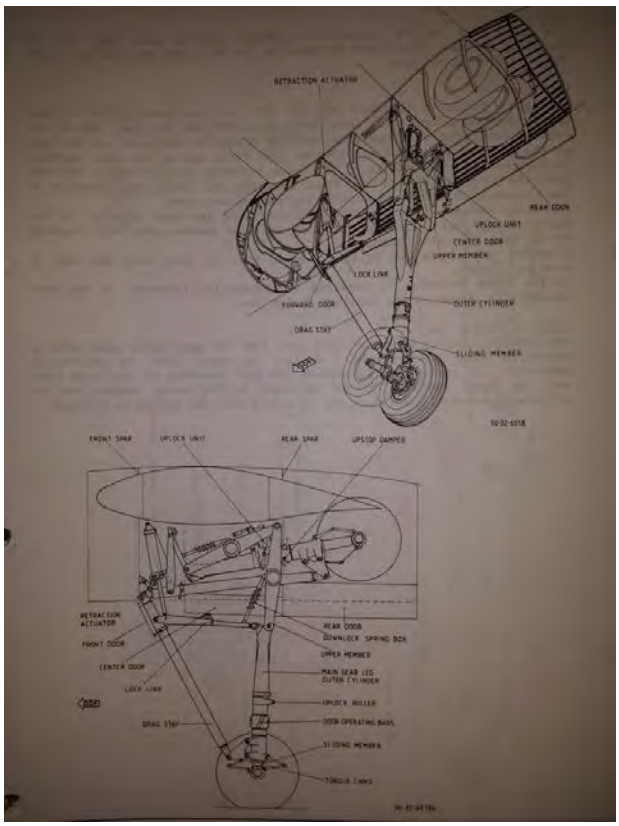
[Source: Airliners.net]



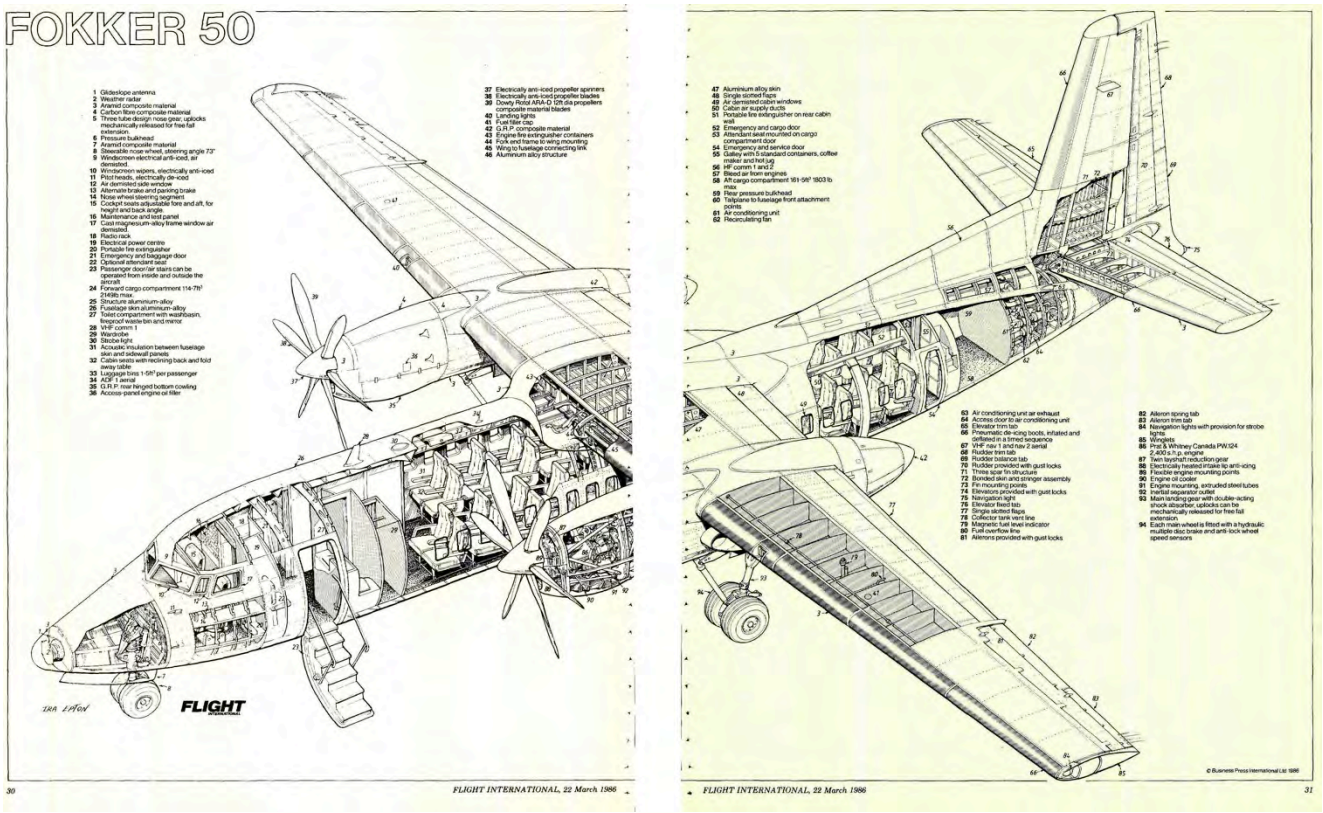
[Source: www.the-blueprints.com]



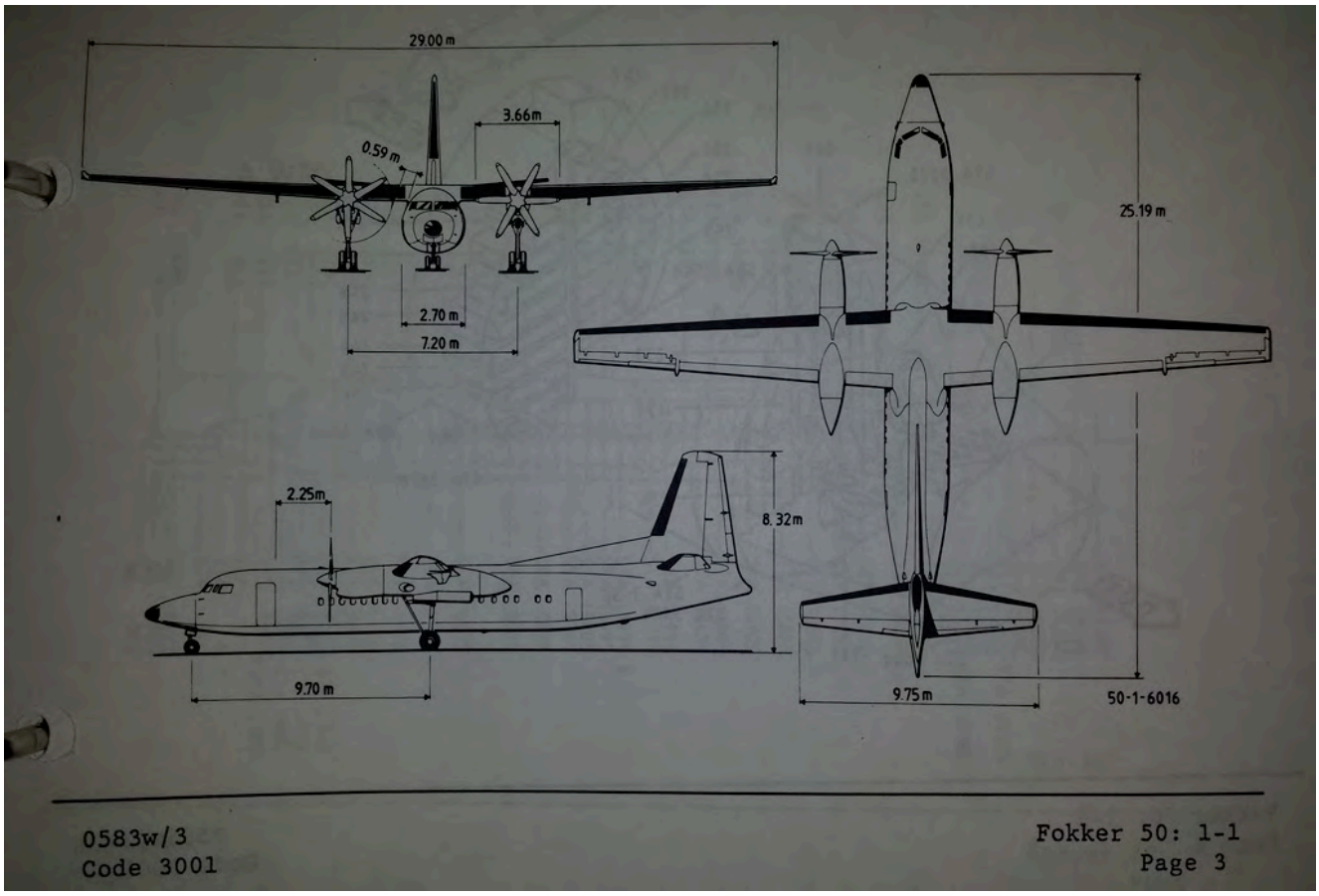
[Source: Arjan Ouwendijk; Fokker 50 course material]



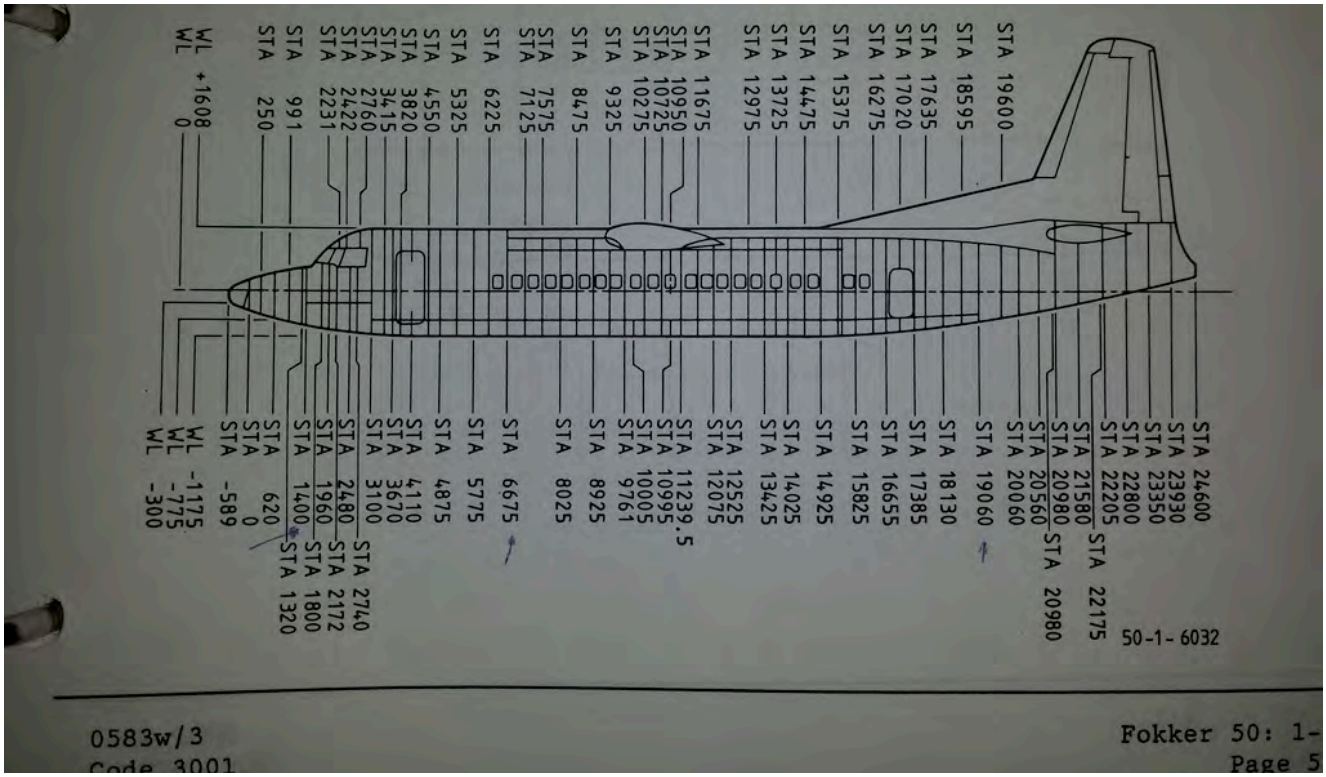
[Source: Arjan Ouwendijk; Fokker 50 course material]



[Source: Flight Magazine; the reproduction of the drawing in the Flight Global Archive is unfortunately missing the centre part; note that the drawing shows an incorrect configuration of the nose wheel doors.]



[Source: Arjan Ouwendijk; Fokker 50 course material]



[Source: Arjan Ouwendijk; Fokker 50 course material]

[1] www.welshmodels.co.uk

[2] As far as I could see from the pictures all windows were present on the DLT Fokker 50s and none were painted over.

[3] With the model of the Fokker F.27 Friendship this was easier done; there the windows are more widely separated.