

FOKKER and the USAAS T-3 COMPETITION

By Gert P.M. Blüm



The still unpainted F.V Monoplane shortly after its completion at Schiphol Airport, without registration. This photo dates from early 1923. (Netherland Fokker photo 466 from the Gert Blüm collection)

In April 1923 in the U.S. aviation press, there appeared several articles on the Dutch Fokker F.V airliner. It was described as a logical successor in the line of earlier Fokker transport aircraft. Of these, the F.IV, or Air Service T-2, was already well known in the U.S. for its world endurance record and long distance flights. Its nonstop transcontinental flight had yet to come.

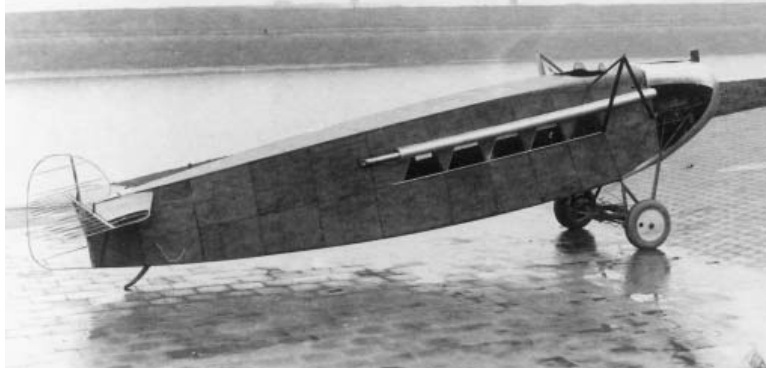
As Anthony H.G. “Tony” Fokker stated after his four-minute first flight in the F.V that it flew like a mob, the positive introduction in the contemporary press was at least remarkable. When the War Department instructed the Air Service on June 24, 1923, “to take all necessary actions to procure all available data on the Fokker F-5 Transport and the Davis-Douglas Cloudster... and to procure one of these planes for test”¹ in relation to the round-the-world flight project, one had to admit that the aircraft was marketed very well in the New World. Nevertheless, only a prototype of the F.V was ever produced and finally sold in Austria at a substantially lowered price.

When, some years ago, a large part of the contemporary correspondence between the Dutch company and its New York branch was rediscovered, it became clear how the F.V received so much attention in the U.S. Being a contender to the USAAS Circular No. 2354 on January 1923 for 10 transport aircraft, much effort was expended to sell the aircraft and to locate its production in the U.S. These efforts were the first steps towards an American Fokker factory.

Foothold in the U.S.

In the early 1920s, Anthony Fokker put a lot of energy and cost into selling his hardware in the U.S. A branch of his Dutch company had an office at 286 Fifth Ave. in New York with Robert B.C. Noorduyn in charge. With WWI still fresh in people’s minds, the branch was named Netherlands Aircraft Manufacturing Co. (NAMC), omitting the Fokker name, which was also dropped from the Dutch firm’s title at the time: N.V. Nederlandsche Vliegtuigenfabriek (NVNV). Originally the Fokker name was printed only on the branch’s letterhead, although later on the well known logo was added. After his initial visit to the U.S. in 1920-21, Fokker was encouraged by some orders for his aircraft and especially the U.S. Army Air Service proved to be a rather promising customer. Although the designated quality standard of the U.S. clients gave Fokker and especially Noorduyn a number of hard edges in the delivery of their aircraft, sale efforts stayed strong.

Buying foreign aircraft was at the time much criticized by the U.S. aviation industry and especially the Manufacturers Aircraft Association, Inc. Noorduyn realized that the only way to get lasting acceptance of Fokker products in the U.S. was to start an American production unit. As the level of aircraft production was very low at the time, and to avoid great risks, such a start could only be justified by a substantial launching order and local capital. So a lot of talks and visits took place before the company finally decided on forming the Atlantic



The nearly completed Fokker F.V fuselage shown on the ramp of the Veere factory about November 1922. (Photo from the Coen Smit collection)

Aircraft Corp. in December 1923, establishing a production facility for Fokker aircraft in the U.S.

The need for a transport

When Noorduynd visited the Air Service Engineering Dept. at McCook Field, Dayton, Ohio, on November 23, 1922, he learned about the future plans of the Air Service for transporting men and material. To realize this vision, there was an urgent need for transport aircraft and Noorduynd knew about a new Fokker airliner under construction in the Netherlands. So he presented the nearly completed F.V as a solution. The same day he wrote a short note to the parent company in Amsterdam, mentioning his talks with the Air Service on the new F.V airliner.

He also urged the sending of photos of the aircraft and information about its performance if fitted with a Liberty engine. He apparently also cabled this information on November 27 and the Dutch Fokker company supplied by mail a German text description of the F.V equipped with a Rolls-Royce engine fitted to the prototype. Someone hastily pencilled the new machine's price (still with Rolls-Royce engine) of DFL 25,000-30,000 (equivalent then to \$10,000-12,000) in the margin.²

Stop-gap F.III's

In the same letter on November 23, Noorduynd pointed out that there was a minor possibility that Maj. Gen. Mason M. Patrick, Chief of the Air Service, might be interested in the purchase of off-the-shelf Fokker F.III airliners, imported mid-1921. At that time two new unpacked aircraft were still stored in Hangar 4 at Curtiss Field, Long Island, N.Y. They were to be fitted with the usual BMW engine but Patrick preferred Liberty engines.

Soon afterwards, Noorduynd travelled to Washington, D.C., to get General Patrick's approval for buying both Fokker Gliders that were used by Fokker at the Rhön glider meeting in Germany in the summer of 1922. McCook Field wished to acquire both airplanes and had already recommended their purchase. Also, the purchase of two Fokker F.III's was brought forward by Noorduynd but the Air Service's objection of the aircraft's BMW engine was the main reason for Noorduynd's second thoughts on the situation. Especially, he was not assured

that reengineering the aircraft for the Liberty engine, as the Air Service had asked for, was a sound idea. As Brig. Gen. William Mitchell, Assistant to the Chief, proved to be in favor of buying the F.III, General Patrick promised as usual to take the matter under careful consideration. Furthermore, both generals were interested in more details on the new airliner, the F.V.³

On December 6, 1922, Maj. Jacob E. Fickel, the Chief of the Supply Div. of the Air Service, asked NAMC in a letter for their lowest price in selling two large transport planes equipped with BMW engines. Next day, Noorduynd offered them for \$12,000 each, set up, tested, delivered and demonstrated in flight at Mitchel Field, Long Island, N.Y. For a delivery at McCook Field, as asked for, extra transport charges would be imposed. General Patrick did not hesitate in letting it be known, through Major Fickel's letter on December 9, that the asking price was too high for the Air Service. After receiving the rejection of the offer, Noorduynd quickly wrote a letter to the Dutch company that he would travel to Washington again to continue the negotiations.⁴ By cable he asked permission to lower his price to \$8,600 each.

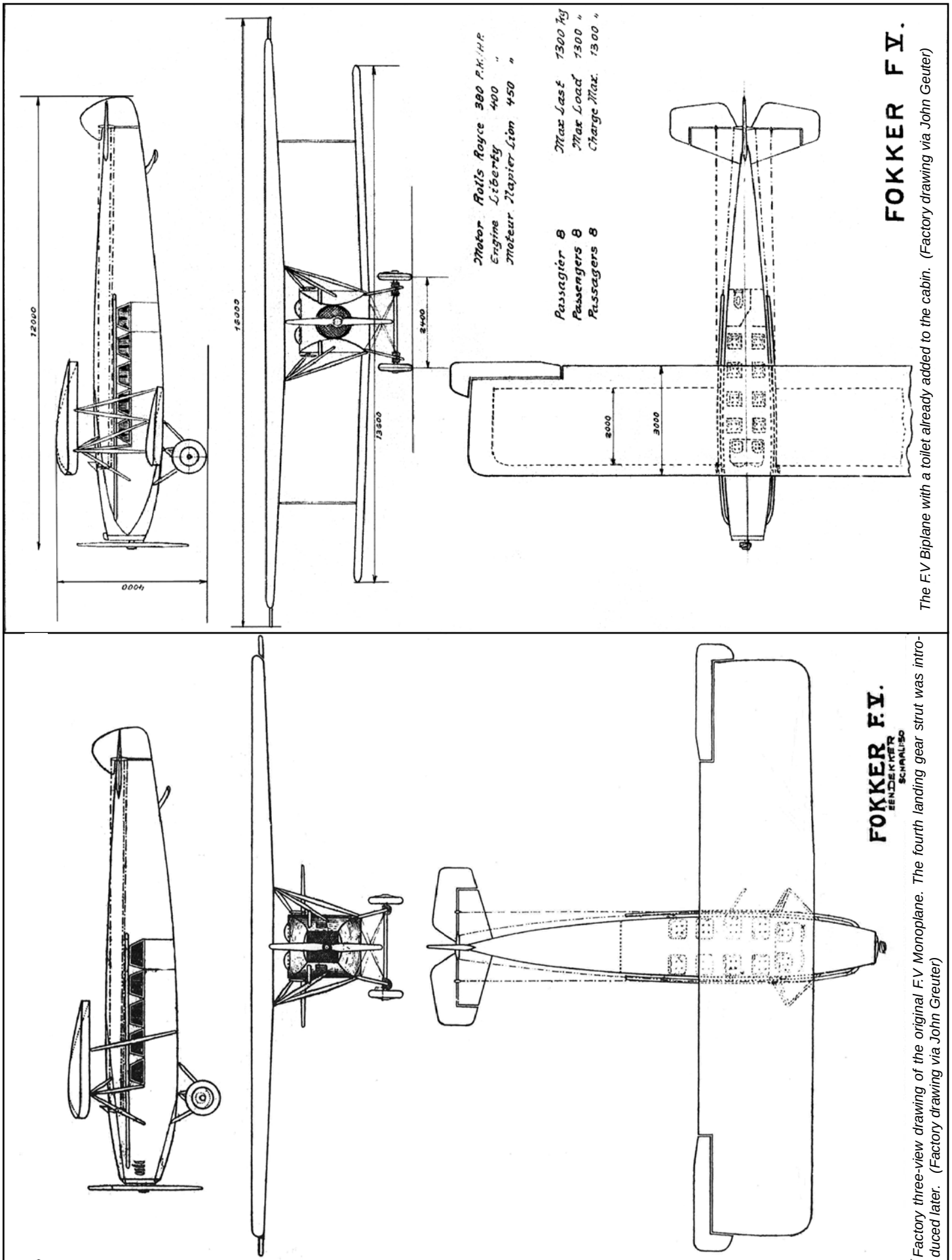
Even a proposal to General Patrick to offer a firm price and to cable Anthony Fokker for his approval of it did not succeed. Patrick was not able to make up his mind. In a final report on the negotiations dated February 2, 1923, Noorduynd stated that he was informed about Patrick's reluctance to buy any aircraft from abroad because he was frightened of repercussions from American competitors and further, the Secretary of War (John W. Weeks) was afraid of the next election.⁵ Even the Fokker F.III fitted with a Liberty engine was no longer an option for the Air Service, since they evidently wanted to standardize on a complete new type of aircraft.

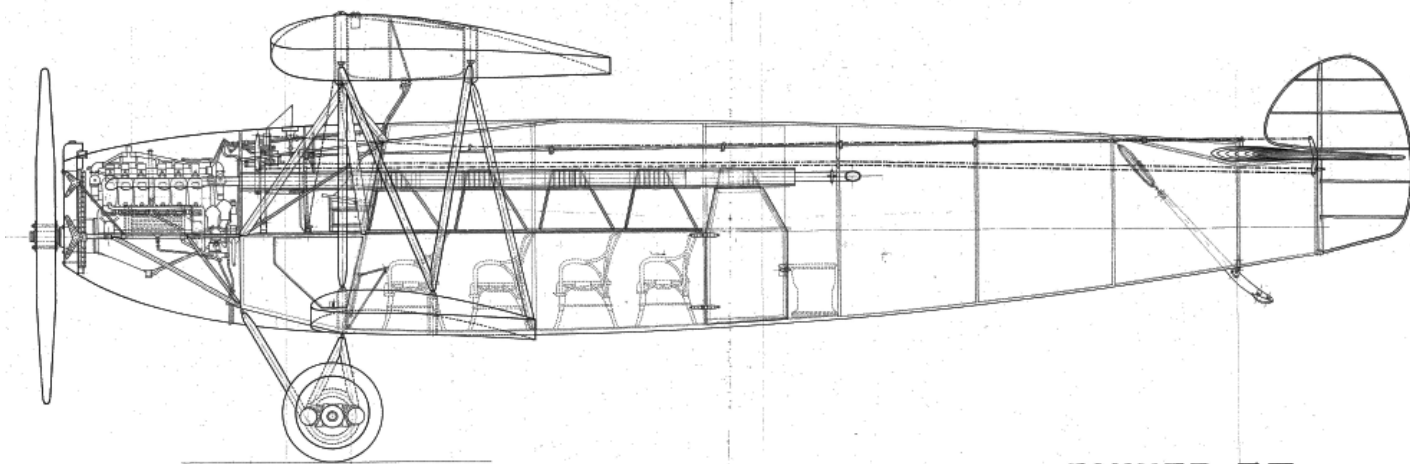
The F.V development

At the end of 1921, at the Fokker plant in Veere, the Netherlands, a factory 'commission' number (a kind of order designation) was assigned to a new type of transport aircraft. Apparently it was set up as a private venture and mentioned F.V. The F.V was not a straight development of the earlier F.IV but was based on a new concept. Its design stemmed from Reinhold Platz, although Fokker would have discussed the design ideas with him. The absence of Fokker during its second U.S. trip, from May until August 1922, might have had an influence on the design work.

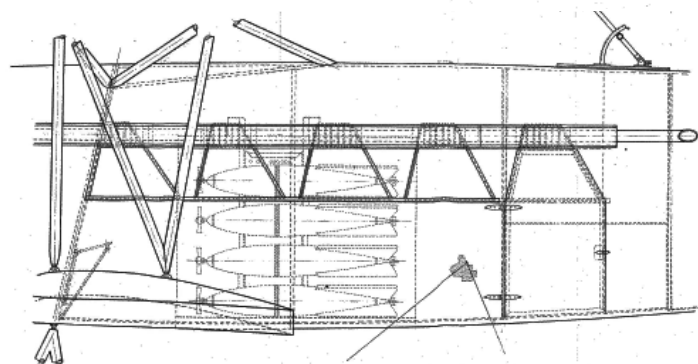
The F.V's steel-tube fuselage offered seating for eight passengers and was, contrary to earlier Fokker designs, completely stiffened with plywood covering on both sides of the tubing. The cabin height was around six feet and a large door enabled passengers to make an easy entrance. Further, the cabin was fitted with a toilet and an ingenious cabin heating system was introduced by routing the engine exhaust along the fuselage.

Two pilots were seated in the open in the front fuselage behind a Rolls-Royce Eagle VIII engine and could enter the cabin through a door. The most unusual feature of the aircraft, however, was the possibility to use both a monoplane and biplane configuration. The plywood-covered upper wing was strutted from the fuselage and the lower wings used N-struts





FOKKER F.V.



A factory drawing that seems to have been included in the offer of Gallaudet to the Air Service. Left: The hastily added lower part of the drawing is fitted underneath an existing section and shows the cabin design for military purposes with provisions for a machine gun and 1,000 lbs of bombs. (Drawing from the Aviodrome – Dutch National Aviation Theme Park and Museum collection)

for its connection to the upper one. The F.V became a parasol monoplane by deleting the lower wings, but also it was envisaged to fit the F.V with the more usual Fokker cantilever monoplane wing of the time as a parasol aircraft.

As the F.V was designed and built in the Veere factory of Fokker in the Netherlands, it had to be shipped to Schiphol Amsterdam Airport for flight testing.⁶ It made its first flight on December 7, 1922, in the biplane configuration with Hermann Hess as pilot. Soon afterwards, a second flight was made by Fokker and Hess as pilots and two passengers: the company's lawyer J.H. Carp and journalist Henri Hegener. The flight ended after four minutes due to serious tail heaviness and poor flying characteristics. For the passengers in the cabin the flapping plywood fuselage covering made any conversation impossible. Hegener later wondered if ever a sharp photograph of the airplane could be made in the air due to vibration problems.

Subsequently, the factory initiated a number of adjustments and also altered the setting of the upper wing. In a letter from the parent company dated December 22, Noorduynd was informed that in a flight of the F.V 1,200 kg (2,646 lbs) useful load was taken aloft, which "was a splendid result for such a ... machine."⁷ Notwithstanding, also the change from the old Rolls-Royce Eagle VIII to a more powerful Eagle IX or a Napier Lion engine was announced.

Circular 2354

The USAAS formulated its wish to purchase 10 new transport aircraft in Circular No. 2354 on January 1923 inviting bids from manufacturers. The aircraft were to be allotted as Air Service T-3 designation. The purchase covered both the

design and construction of a Liberty-powered aircraft with a crew of two and transporting six passengers. A useful load of 2,520 lbs was prescribed as were a speed of 105 mph and a service ceiling of 10,000 feet. These demands of the purchase were described in Engineering Div. Spec. No. 1556. Noorduynd received Circular No. 2354 at his New York office on January 6, 1923, and shipped it the same day to Fokker in Holland by the S.S. *Noordam*.⁸ Undoubtedly, to Fokker's satisfaction, the specification mentioned "*The only restriction, as to type of construction ...is that the fuselage (of the aircraft to be purchased) shall be of welded steel tubing.*" Further, the engine, instruments and standard accessories were to be furnished by the Government.

At that time Noorduynd still was hopeful of being able to persuade General Patrick to order the F.V off-the-shelf instead of through a bid to the circular. As argument for this, he stated that the F.V already was flying and being a "proven design," whereas no other aircraft fulfilling the terms of the specification were available. Thus, he also intended to avoid the (in his opinion) shameful conditions of the circular, i.e., the poor royalty payment and the reward for copying a foreign design.⁹ However, these efforts were in vain and Noorduynd decided on another tactic. He teamed up with (then Captain) Reuben H. Fleet of Gallaudet Aircraft Corp.,¹⁰ who had just left the USAAS at McCook Field, to formulate a proposal for the circular.

Cooperation with the U.S. Industry

In the second part on October 1922, Noorduynd had contacts with a New York attorney, Charles S. Guggenheimer, who in turn had spoken with people representing the shareholders of the Gallaudet Aircraft Corporation. In Guggenheimer's



The F.V Biplane looks like it's ready to serve you. Note the newly introduced trapezium style rudder in this early 1923 photo. (Netherlands Fokker photo 521 from the Thijs Postma collection)

opinion, Gallaudet was nearly bankrupt but the organization could be given a second life as the American Fokker Company. This was envisaged to be realized with a technical participation of Fokker and new capital from the existing shareholders.¹¹ Furthermore, the Gallaudet facilities at East Greenwich, R.I., were to be used. For this prospect, Fokker was willing to give up his earlier commitments for a new factory in both Milwaukee, Wis., and Philadelphia, Pa., in exchange to a liaison with Gallaudet. In the talks, the new corporation's establishment was coupled on a future USAAS order.

The Milwaukee business location was promoted and organized by Tony Fokker's former companion Frits Cremer, a school friend who had followed him to Germany in his early years and stayed with Fokker until their mutual return to Holland in 1919. Cremer might have used his father's position as Dutch ambassador in Washington to start a new life in the U.S., operating in close collaboration with Fokker. As such, he was in charge of the NAMC's office in Milwaukee, perhaps because the company's address was located at his home. A group of Milwaukee businessmen was found to be interested in a joint venture with Fokker, but the contact with Gallaudet led to a break up in the future collaboration and ended a friendship of nearly 20 years between Fokker and Cremer in December 1922.¹²

Similarly, the Philadelphia connection fell through during this period. Around the end of 1922, talks took place with Philadelphia businessmen on using the local Cramp ship yards for airplane manufacture.

Fokker and Gallaudet joined forces

Gallaudet had, when contacts with Fokker became close, already worked for several weeks on its own design to the Engineering Div. Spec. No. 1556. They postponed their own development work for a transport aircraft in favor of the adoption the Fokker F.V design. Noorduynd and Fleet started

together to draw up a cooperation contract and to alter the F.V design to the Air Service's wishes. In the meantime, in Holland, Fokker acted rather reserved on the cooperation and instructed Noorduynd to bid both independently and in combination with Gallaudet, apparently still hoping to conquer the opposition of the U.S. industry. Very subtle, he wrote to Noorduynd that the lack of a formal agreement with Gallaudet could not worsen his position, as long as no blueprints were given to them.¹³

Also, Fokker revealed to Noorduynd that, at the office of McMahon in Milwaukee, a power of attorney was deposited. This gave Noorduynd authority to incorporate a new U.S. Fokker Company in order to start aircraft production. At the same time Fokker realized that the conditions of Article 5 in the circular (to have both production facilities and adequate personnel) could block any order.¹⁴

At the end of January 1923, all necessary paperwork for the F.V bid was sent from the Netherlands to the U.S., to let the American branch complete the proposal. This, however, proved to be more complicated than expected. Noorduynd spent four days with Fleet at the Gallaudet factory to redesign the proposal in accordance with the Government's requirements. The required changes were:

- cabin door enlarged to admit entrance of a Liberty engine
- emergency exit resulted in change of fuselage structure
- gun ring added
- cabin made suitable for 11 ft. 6 in. propeller stowage
- double fuel tanks in the wing provided outside the fuselage
- increase of the radiator surface by 98 cm² (15 sq. in.) implemented
- introduction of 44x10 Air Service wheels.

So, the bid was updated to fit requirements of the proposal.¹⁵



An altered pilot's windscreen is fitted and the aircraft's identity has at last been painted on the nose. (Netherlands Fokker photo 617 via Coen Smit)

When Gallaudet offered 10 F.Vs to the USAAS in their response to Circular No. 2354 on February 12, 1923, the existing prototype was offered as well as nine production aircraft. The prototype was to be modified with a Liberty engine and according to the offer "conformed substantially to the specification." It could be delivered for inspection to Dayton seven weeks after the approval of the contract. The next nine aircraft were to be of the production type as built by Gallaudet.¹⁶

Noorduyn was not pleased with the price calculation for the production aircraft. The price for the F.V was set by Gallaudet at \$23,900, which was in the opinion of Noorduyn rather high, although Gallaudet's own proposal was figured before at \$26,900. Whereas the Dutch company had indicated that a minimum price of DFL 30.000 (or about \$12,000) could be reached less engine, instruments, propeller, packing and transport, the aircraft would be much cheaper if built abroad. However, chances for a foreign company to obtain the order were supposed to be nil, so Gallaudet's price tag was accepted. Fleet estimated that the majority of prices would run a little over \$20,000 and that he would be able to put through the deal at a slightly higher price owing to the fact that the machine that was offered actually was flying and quick deliveries could be made.¹⁷

The Air Service's preference

The urgency to make use of transport aircraft was formulated by Article 2 of the circular:

"In awarding the contract, the Government will consider merit of design, price, delivery dates, ease of production,

*estimated cost of maintenance and all other pertinent elements. As the Government desires to have these airplanes in service at the earliest possible date, times of deliveries will largely influence the award."*¹⁸

So the assumption of Fokker and Gallaudet that a proven design had its advantage was reasonable.

Yet, the small business volume had encouraged the U.S. aircraft industry to start a number of new designs. When the bids were opened by the Contracting Officer at Mc Cook Field in the presence of the competitors on February 15, 1923, at 2:00 p.m., nine proposals proved to be brought forward. The summary of the particulars of the bids were:

Competitor	Price for 10 machines (in dollars)	Delivery of machines (in days) x		
		first	second	all
Thomas Morse	227,960	46	152	235
Boeing	167,500	50		200
Curtiss bid A	181,000	120		240 +
Curtiss bid B	219,625	150		240 +
Huff Daland	187,000	120		430
Loening	187,000	90		212 +
Elias	240,000	90	150 +	270 +
L.W.F.	127,400	70		161
Gallaudet F.V	239,000	49		238 +

x = after acceptance of mock up (and specific changes).
+ = acceptance and test time of first machine to be added.

The favorable offer from LWF was based on the fact that the company already had a U.S. Navy contract for 20 Davis-Douglas torpedo planes and intended to use the wings and tail surfaces of that aircraft for the new transport.¹⁹

Noorduyn immediately realized the bad position of Fokker/Gallaudet in the competition but mentioned in his letter to the parent company on February 23, 1923, Fleet's efforts to get the F.V accepted in spite of the price. He also gave as his impression that, if it was left to McCook Field, they would buy the Fokker. In realism he added that "they are afraid that the General will not agree." Four days later, on February 27, Fleet wrote in a letter to Noorduyn that the transport order was awarded to LWF but he would make a final offer to the Air Service to buy some F.V aircraft for trial. However, all efforts were in vain. The LWF proposal became the new Air Service T-3 and the F.V never reached the U.S.

Gallaudet on its own again

After the failure to get their joint bid accepted, Gallaudet and Fokker separated and resumed their own individual courses. They met again when both tried to engage the services of Col. Virginius E. Clark when the Dayton Wright Co. went out of business. Fleet won, as he was able to engage him and managed to get the Air Service production order for the reengineered training ship that Clark designed for Dayton Wright. Sometime afterwards, Noorduyn even proposed to put up a strong fight against Gallaudet for a USAAS order for a training plane of Fokker design.²⁰

More F.IVs

As soon as Anthony Fokker learned about the Air Service's need for more transport aircraft, he suggested to Noorduynd to try to obtain a repeat order on the F.IV that had been successfully used by the Air Service as T-2 (and later A-2). After the decision to order the LWF T-3 he kept hammering on Noorduynd to try to sell more T-2s at DFL 25,000 plus. Even when the bid forms for the F.V proposal on Circular No. 2354 were sent to the U.S., he cabled the Air Service to ask for a follow-on order for the F.IV/T-2. But Noorduynd in a letter on May 23, 1923, to Fokker, in relation to talks on a proposed round-the-world flight, explained that the lack of money for FY1923 was also reason for not ordering a redesigned F.IV.

On the other hand, Fokker started to brief Noorduynd on a new promising transport design, later to become the famous F.VII. Not one word was spent any more on F.V. In a letter of January 1923, he had mentioned that the mock-up stage for a F.VII development had been reached and he would send drawings of the design to McCook Field. Of interest is that its use as a bomber was also foreseen.²¹ Significant was the absence of discipline in assigning factory designations as Fokker mentioned the aircraft as the F.VI. However, the F.VI designation was skipped for transport aircraft as it was, for still unexplained reasons, the factory designation of the Air Service PW-5 aircraft. Soon afterwards, the new transport was called F.VII. This time, Walther Rethel, the former engineer of the German Kondor Werke and later associate with Arado in Germany, was the designer.

World Flight

When, in the second part of June 1923, the F.V was resurrected by McCook Field as contender for a world flight, the failure of the F.V was already well known at the parent company. A demonstration trip to Moscow did not lead to the Soviet order for 10 aircraft that was hoped for and the development of the F.VII got priority over the improvement of the F.V. It seemed that Noorduynd's knowledge of the F.V's performance soon led to it being eliminated for the proposed world flight by the Air Service.

In a Fokker press-release in early 1924, the F.V was mentioned as preferred by Roald Amundsen for his Arctic Expedition. However, as stated, the company was involved in executing many important orders and had no capacity to modify the aircraft to the specific wishes of Amundsen. Fokker was able again to turn his disadvantage into a benefit.²²

What became of the LWF T-3?

To be brief, only a prototype was produced and the nine production aircraft were cancelled when the company was not able to produce an acceptable aircraft. However, Douglas managed to succeed where LWF failed. They put the wings of the Douglas Torpedo on a new fuselage and delivered the nine remaining transports as the Douglas C-1, the first type in the new cargo class, both ordered and delivered in FY1925.



The F.V Biplane, with dorsal fin added and registered RR13 before its demonstration trip to Moscow in early June 1923. (Netherlands Fokker photo 623 from the Gert Blüm collection)

Fokker got the reward for its earlier sale efforts when the next cargo aircraft of the USAAS, the C-2, was theirs. Ironically, this type was the trimotor development of the F.VII that had led to the F.V being shelved, and which finally proved to be one of Fokker's most successful transport aircraft.

Further history of the sole F.V

Regardless of repeated talks, KLM could not accept the F.V's price tag²³ and the Rijksluchtvaartdienst (Dutch certification authority) disapproved of its construction. Only after 15 months and repeated talks, a restricted Certificate of Registration for the registration mark H-NABW was issued, notwithstanding its use by NVNV for already a year. In between, the Russian marks RR13 were used briefly for the demonstration trip to Deruluft. In the early spring of 1924, Fokker's clever salesman, Friedrich W. Seekatz, finally succeed in selling the sole F.V to Austria. Registered as A-7 it was used for sightseeing flights from Vienna but put up for sale soon after its purchase. Its final disposition is unknown. Rumours mentioning its next identity to be I-AAANS are clouded by the mid-1929 registration of a Fokker F.V Oberursel, which proved to be a single seat E.V Monoplane of war heritage.²⁴

Why the Emphasis on the F.V?

Tony Fokker must have had second thoughts on the merits of the F.V at the time it was offered to the USAAS. Not only did he insist several times upon letting the Air Service place repeat orders on the satisfactory F.IV/T-2 aircraft, but also proposed the development of the F.V using a more conventional Fokker cantilever wing. Reports even mention the F.V flying with such a wing in mid-1923. The pressure to introduce of the F.V in the U.S. would have come from Noorduynd, unaware of the aircraft's poor performance, but eager to set up an American Fokker factory. This finally was achieved when, thanks to a USAAS order for "rebuilding" 100 DH-4 aircraft with a steel tube fuselage, Atlantic Aircraft Corp. was incorporated in December 1923. Using the premises and factory of the bankrupted Witteman Aircraft Corp., the effective production of Atlantic-labelled Fokker aircraft in the U.S. started in May 1924. Incidentally, the first task was the rebuilding of an English type of aircraft for



Royal visit aboard. Prince Hendrik, consort to Queen Wilhelmina, gets an explanation in the aircraft by Anthony Fokker in the pilot's seat. (Photo from the Gert Blüm collection)

the U.S. Services by one of Germany's main aircraft producers during WWI nearly five years after that war had ended. Only a Fokker could achieve such a feat, notwithstanding his failure to win the F.V production order.

Acknowledgments

Thanks to Harm Hazewinkel who did much to unravel the F.V's history, Kase Dekker for proof reading the text and our son Jasper to clean up the old drawings.

About the author

Gert P.M. Blüm is a retired project/crisis manager for utility construction works. Educated in civil engineering at Delft Technical University, the Netherlands, he was an advisor to many public services. American Fokker aircraft of the "between the wars period" was a lifetime interest.

Currently, he serves as a judge for construction disputes. Gert and his wife Liz have two sons and lives in Santpoort-zuid, just north of Haarlem, the Netherlands. For an earlier article in the *Journal* on the Fokker FT for the U.S. Navy, he served as a coauthor.

Notes

- 1 Francillon, McDonnell Douglas Aircraft since 1920, Putnam, p.70
- 2 Letter NVNV # 581/NAMC Nov. 27, 1922
- 3 Letter NAMC # 505/NVNV Dec. 5, 1922
- 4 Handwritten note of Dec. 11, 1922, on carbon copy letter USAAS-MD/NAMC
- 5 Letter NAMC # 554/NVNV Feb. 2, 1923
- 6 The nearby airfield Souburg still was exclusively used by the military services
- 7 Letter NVNV # 596/NAMC Dec. 22, 1922
- 8 Handwritten letter NAMC/NVNV received Jan. 18, 1923
- 9 Ibid
- 10 Wagner, Reuben Fleet, Aero Publishers, pp. 4/6
- 11 Private letter R.B.C. Noorduyn/A.H.G. Fokker Oct. 20, 1922
- 12 Hartendorf c.s. Duin en Kruidberg, De Vrieseborch Haarlem, p. 170
- 13 Letter NVNV # 620/NAMC Jan. 29, 1923
- 14 Ibid
- 15 Letter NAMC # 556/NVNV Feb. 14, 1923
- 16 Letter Gallaudet/USAAS-CO Feb. 12, 1923
- 17 Letter NAMC # 559/NVNV Feb. 23, 1923
- 18 Aviation Jan 22, 1923, p. 94
- 19 Ibid 17
- 20 Letter NAMC # 635/NVNV May 23, 1923
- 21 Ibid 13
- 22 Fokker Bulletin Feb. 23, 1924, p.1
- 23 Dierikx, Fokker a Transatlantic Biography, Smithsonian, p.92
- 24 Luchtvaartkennis 1/2008, p.15

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