

The Fafnir

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The Fafnir was perhaps the first truly elegant sailplane. It was designed in 1930 by Alexander Lippisch for Guther Groenhoff. With Hirth and Kronfeld, Groenhoff was one of the stars of the early German gliding movement. Small of stature, Groenhoff was both daring and skilful and had a haircut young people of today would spend hundreds of dollars in "product" to achieve.

The Fafnir was very high aspect ratio for the time and had highly tapered wings. Lippisch controlled what would otherwise have been a dangerous tendency to tip stall by changing the almost standard foil section of the time at the root, a high camber Goettingen 652, to a basic Clark Y section at the tip with a few degrees of washout. The result was a heavy glider which was nevertheless very efficient and which could bank steeply with minimal loss of height. This was important at the time because although Hirth had just "invented" banked turns in thermals, most flyers still thought that flat turns were the way to go. Groenhoff and the Fafnir would prove them wrong.



The Fafnir had for the time, some unusual features. First was the gull wing. There appears to have been no strong aerodynamic reason for this shape. Lippisch stated that it held the wing tips clear of the ground to avoid damage, but a straight dihedral wing would have done the same. Undoubtedly the gull wing was elegant and set a fashion which would last until the '50s. The other remarkable feature was that the pilot was completely enclosed and had no forward vision. The only way Groenhoff could see out was through two circular portholes, one on either side of the cockpit. No doubt the wind

noise through the porthole during a side-slip would have encouraged well-coordinated turns!

The Fafnir was not immediately successful. The earliest design had poor fairing between the fuselage and wing root. When this was corrected, the Fafnir achieved all its designer and pilot expected of it. In 1931, when the Fafnir was a year old, Groenhoff flew a record 272km flight from Germany into Czechoslovakia. At the time, the FAI only recognised records from gliders launched by the "classical" bungee launch method. But for this flight, Groenhoff was launched by aerotow so the record was not accepted.

The following extract is from Groenhoff's own account published in his book, "Ich fliege mit und ohne Motor."

"With the flight to Buehl the usefulness of the aerotowing of gliders had been proved. On behalf of the Rhoen Rossitten society I would demonstrate this new method and the flight should also prove useful for the research into areas of meteorology for the Munich Meteorological Conference.

On 4 May, 1931 the weather briefing in Munich began in the morning. With the dominant northwest wind the plan emerged to try an Alpine sail flight. I had arrived at Munich the day before with the Fafnir and the tug.

On the Oberwiesenfeld airfield everything is clearly ready for the start and I want to begin to collect good information for the meteorologists, but typically the wind turns and throws out our plans, but there are many beautiful cumulus clouds in the sky. Amongst them one had to be able to hold a glider steady. Peter Riedel in the sluggish engine machine gives full power and soon pulls me with the long towrope over the airfield at 120m.

The Fafnir makes an efficient bounce on the molehills and then floats steadily behind the tug. Humans and houses down below alpinbecome ever smaller. We have enough height to fly us over Munich. I observe carefully each movement of the Fafnir, in order to get the correct moment for releasing the towrope. There is a slight jerk, the towrope falls downward. Riedel immediately flies back to the airfield and leaves me to my fate.

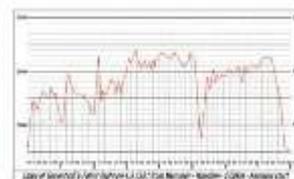
The thunderstorm forms. The first hail falls with uncanny uniformity on the structure Thick, down-torn clouds hang down before me. The thunder follows, each time with lightning and terrible rumbles as if everything would have become an empty space. I strain to hear whether my instruments are still functioning, because of the way that the flight had started. What will now happen will be of extraordinary importance for the scientific evaluation of the flight.

Again I consider whether I dare to continue this flight into these enormous natural forces outside, but the options had already been forged as I had sufficient time to consider what I wanted to do in such a situation. Thoughts come and go. Finally the time approaches. In the middle under the heavy dark clouds the Fafnir begins to rise evenly at five metres per second. The view becomes ever worse downwards. Behind, the earth slowly disappears. Laterally, lightning flashes in the grey, but of the thunder nothing is to be heard. The hail strikes noisily on the Fafnir.

My instruments still shows 'climb'. The air becomes jerkier. It becomes more difficult to hold the Fafnir in a normal position. The air speed indicator decreases then returns suddenly. I descend fast, in order to keep flying speed, but the pointer jumps back and forth, and the Fafnir whistles loudly with the excessive airspeed. The speedometer is clogged by hail and precipitation. Similarly the artificial horizon is affected. Only with the compass and my senses am I able to continue the flight.

The gusts become stronger. The hail falls in cherry sizes and hits with such force against the covering that slowly large tears develop. The elevator is of little use. A strong gust lifts me into the canopy cover above the top of my seat. The machine reaches such high speeds that I watch the wing in order to see how they will break. But they only bend into degrees I would never have considered possible.

Occasionally lightning flashes; apparently in close proximity. The thunder cracks, as if the lightning would be struck into the machine, then rumbles slowly afterwards from above. I try again and again to fly northeast, using the compass in order to come ahead of the thunderstorm.



Finally, I succeed. The hail patters more quietly and then, in time, I see the earth very hazily beneath me. I immediately push the Fafnir into a steep spiral dive.

It is as if I could breathe deeply again for the first time in a long while. In the brightness I view my wings. They have long tears and many small holes. Water and hail lie as a thick layer on the wing, but the faithful bird still flies so beautifully that I do not need to feel concern.

The heavy thunderstorm was perhaps a hundred metres behind me. The whole grey of the storm is continually in motion. Large eddies form; an area for aeroplanes that would be difficult to overcome. Before me a marvellously illuminated landscape lies to the northeast and in the south, ahead of the thunderstorm, can clearly be seen the long Alpine chain lit by from the sun.

First I go on patrol, in order to see what size the "front" is and where the best rising air is to be found. That can be done fast. The thunderstorm is judged to be small, perhaps 15km in expanse.

There are fronts of 1000km width. Ahead of the thunderstorm the rising air is even and strong so that I climb fast to approximately 2200m. From time to time clouds form around me. But in blind flight I fly again and again with course northeast to head out of the front. I fly for hours following the thunderstorm.

At one time I discover a butterfly at these unbelievable heights. I wonder if, like me, this small chap freezes; but already I am past it. My seat becomes damp. The hail, which collected on the surfaces, is melting. The water gathers in the fuselage and begins to slowly rise. For a long time I bore into the floor until I have a hole through the plywood by which the water can leave.

Blind flight! It is interesting to observe what takes place down on the ground if a thunderstorm arrives. If a large smoke trail emerges somewhere, I observe the exact direction that the smoke takes. I can see exactly how the wind slowly turns ahead of the thunderstorm and how the thunderstorm lifts the smoke upwards at its front. On the edge of the thunderstorm, long spirals are pulled upwards.

Down on the roads the vehicles dash. They want to get home before the cold rain shower. Sometimes I can observe how the rain approaches them and then steadily pours. In the trees the storm before the thunderstorm begins. Lightning flashes continuously to earth and sometimes into my locality. Has it caused a fire somewhere? Nothing is to be seen.

After a long flight I recognise before me the course of the Danube and then beneath me the Valhalla. From Regensburg I cannot see much any longer, because clouds form everywhere around me and completely surround me. In blind flight I try to fly again a northeast course to the front, but it seems to last for an eternity.

Again the hail begins. It is unexplainable. I assumed that the compass had failed and I had again flown back into the thunderstorm.

The Fafnir suddenly falls steeply downwards. I come out from the clouds and approach the ground quickly. I recognise that I had come into a developing thunderstorm in blind flight and am now being pressed down in the descending air on the back of the storm.

I circled back to where I had come from, but it seemed too late. At, perhaps, 150m above ground the descending air finally stopped. I still had sufficient height in order to look for a landing place. Before me I discover a small slope. I must try and hold there for a few minutes. With great caution I circle for approximately 10 minutes back and forth and maintain my height.

The thunderstorm catches up me with me again, the updraft strengthens and then the thunderstorm pulls me back to my previous height of 2000m. The thunderstorm passes now over the Boehmerwald, strengthens again and unloads itself with force over the mountains. Slowly the evening approaches. The sun appears on the clear horizon and floods everything with a red glow, a powerful picture after those many exciting events. In order to land before darkness, I fly away from the front and the good lift.

Slowly I lose my height in gliding flight, but the darkness comes much faster than I had expected. When I am still scarcely 1000m high, the first lights below are already turned on. The view becomes ever worse. I see after some time, how in a larger city before me the road lighting in a quarter is switched on one by one. I fly on in the direction of the city where I will get assistance.

I can no longer recognise the area below me. Suddenly, I see the lights of a house close beneath me. It is clear I must land immediately. I shout as loud as I can to catch attention, however, suddenly I am again over a deep and steep river channel. Between these steep slopes, without any embankment, flows the Eger. I wanted to circle back, but I cannot reach the edge of the slope as I had no height left.

The far side of the river lay lower and I tried to fly over there. Now I notice how bad the Fafnir has become with the hail damage. It descends fast and becomes very exciting, but with a few metres height I arrive at the other side and land smoothly in a young oat field, just before a high voltage line. Since I hear no one, I call out loudly: Hurrah! I lift my rigid members from out of the fuselage, but my limbs no longer want to move. Soon I find myself standing beside my dear Fafnir, the faithful bird. She seems badly mangled. The instruments still tick to their even work.

After I had called aloud for a quarter of an hour my throat was hoarse and there was still no curious appearance from the public, I decide to follow the high voltage line along to the next settlement over fields, meadows and fields. From time to time there is still more lightning in the distance. On the opposite side of the Eger, along which I am walking, there are so many houses, but nowhere is there a boat to be found with which I could cross over.

After three-quarters of an hour I see a peddler, an old man with a large box on his back. I call him. He gets such a fright that he immediately drops his box and tries to disappear behind a few shrubs, but I am much faster. I calm him down with some words and find that he is going to the next locality after Kaaden. I tell him that I had landed with a glider, an aeroplane without engine, in the proximity, so he might be a little interested.

Along the way, he described the interesting life he had as an organ player. Thus we drew into Kaaden as good acquaintances and said our cordial goodbyes.

The authorities in Kaaden had more interest in me. They seized the Fafnir and took it and me into military custody. I had to disassemble the Fafnir in the night onto three horse carts, and with the aeroplane bedded on straw, we drew into the

barracks at five o'clock in the morning. At seven o'clock the telegraph office finally opened. I could now telephone the message of my safe arrival. This was probably the most beautiful moment of my flight, because I knew that everyone had waited for my message and with everything else, they were pleased. In eight-and-a-half hours flight I had flown 272kms and had brought rich information for the meteorological research at home".

When the news came through that Herr Groenhoff was expected back at the Wasserkuppe after his record flight, arrangements were made immediately to offer him a right, royal welcome. Small trees were felled, wood collected, and three cans of petrol obtained. Out at the crossroads a huge beacon was built with the petrol amply scattered around. Inside the Deutscher Flieger Hotel tables were set in one long line, and all was bustle.

At 8:00pm a telephone message informed us that the hero had left Gersfeld, which is the village at the foot of the high ground. In 10 minutes the beacon was well alight, and the blaze on the top of the Wasserkuppe could be seen for miles around. The ambulance man had brought one of his stretchers on which was placed a chair. The car arrived and "the Boy" (Herr Groenhoff) was pulled out by his hair, placed in the chair, carried round the Kuppe and then into the hotel. Still in his chair, which was placed on a table, all students and everyone present passed in front of him and congratulated him.

We were then seated, with Groenhoff at the head of the table, and beer provided for everyone. He had a look round and saw that the workmen who had made his machine, were not present. Asked why, he was told that they were still working on his next machine. They were promptly sent for and he thanked them very much for putting such good work into the machine, thus enabling him to attain the record.

Herr Hirth then proposed that Groenhoff should relate to all his experiences. "Well Boy," said Groenhoff, "I was towed off by a Flamingo to 600m..." "...and the rest is history".

A year later, Groenhoff was dead, killed in a crash in his Fafnir. He'd had two bad accidents in the days leading up to this. In one, the rudder became detached and in another half the elevator broke off the Fafnir after launch but both times Groenhoff managed to land okay. Groenhoff was suffering from depression. He'd been driving an open car where the sister of the tug pilot, Peter Riedel, was killed and Groenhoff was at fault.

At the 1932 Rhön, a few months later, after the wind had changed on the hill, Groenhoff tried a downwind bungee launch. The heavy Fafnir skidded and bounced down the hill, the low-mounted elevator hit a rock and jammed. Groenhoff was airborne for half a kilometre before the fuselage broke near the tail and the glider went into a spin. A body was seen to leave the cockpit and a parachute open, but it was too late to save the life of poor Groenhoff.



Groenhoff auf dem Fafnir am Hanghangen