



Lothar Sieber, Pilot of the "Natter" Ba 349A M23 ⁽¹⁾

Lothar Sieber World`s First Rocket Pilot

In comemoration of the Space-Pioneers

Lothar Sieber, born on [7 April 1922](#) in [Dresden](#), died March 1st , [1945](#) at [Heuberg](#), Württemberg, at the age of 22 in an attempt to perform the first successful piloted vertical take-off flight of a [Bachem Ba 349](#) "Natter" jet-powered vehicle. Before becoming a test pilot for Bachem (Bachem Airplane Construction Company, Bad Waldsee, Württemberg) Sieber piloted an [Arado Ar 232](#) and other aircraft in high- risk air force sortie missions. Sieber held the rank of [Second Lieutenant](#) and was promoted to [Oberleutnant](#) posthumously.

On a foggy morning on March 1st , at [the military test area at Heuberg](#), clad in his gray flight-test overalls, pilot`s leather cap and goggles Sieber squeezed uncomfortably into the Natter Ba 349A M23 cockpit and strapped supine position, assisted by two technicians who closed and secured the canopy on him for the first manned vertical take-off of a rocket powered vehicle, his legs aimed upwards into infinite space. What might his thoughts have been? Pondering his choice – as we know many of today`s Astronauts do – or thinking about his fiancée Gertrud Nauditt? We would not know, however, we do know that he said to friends the evening before: “I hope it will not be worse than my previous mission – I know I can do the most crazy things without putting myself in jeopardy,” however he also signed his will in favor of his fiancée.

The young, yet very experienced test pilot was told to execute a half roll should the Natter roll into an inverted position, which was a tendency taken advantage of in unmanned vertical test flights to stabilize the vehicle. The lift-off worked as planned; all things went well at first and the vehicle pitched 30 deg off the vertical tilted climbing trajectory. However after burnout of the four [Schmidding](#) solid fuel strap-on boosters, one of the cylindrical containers failed to release and immediately after that the cockpit canopy came off inexplicably and was seen dropping to the ground. At that point the Natter was in an inverted flight position, however it looked from the ground that Sieber still was able to execute a 160 deg roll maneuver bringing the plane into a nose-up climbing position again.

At a height of approximately 1500 m, the vehicle disappeared in a heavy cloud layer and eyewitnesses reported that the main engine kept firing. Soon, the Natter reappeared vertically, nose-down from the clouds in a slow tailspin and hit the ground at full speed. All eyes searched for Sieber to appear with his parachute from the clouds, but to no avail. It was speculated Sieber lost his orientation inside the clouds because he did not rely on the automatic flight path guiding system which was switched off on his own request. This automatic system was designed and tested before in unmanned flights to pilot Natters also with less experienced pilots.

Afterwards the explanation by the eyewitnesses was, that with no--or impaired--vision of the pilot, the Natter probably turned on its back in the cloud layer and flew horizontally rather than climbing, thus accelerating. Sieber might have misinterpreted this for a steep nose dive, pulling harder on the thrust rudder to climb again – but only made things even worse. Also, the fuselage recovery parachute which

could have been used for braking was not usable because the stowage compartment hatch was blocked by the stuck booster.

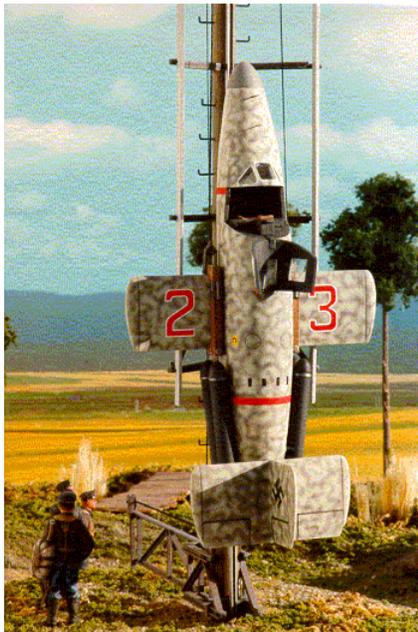
It was further speculated that when the Natter left the clouds, Sieber might have noticed his situation and tried to bail out, but due to the high speed and slow tail spinning motion he managed only to get out partially before the violent impact. At the impact site, about 7 km away, a 5 m deep crater and remains of his body were found.

Soon after this tragic accident the military canceled the project. The cause was officially explained as a failure of the canopy which may simply not have been properly latched before launch.

In 1998-1999, a research team found the remains of one of the strap-on SG-34 booster at the impact site, proving that it indeed was not jettisoned after burnout from the fuselage of the Natter.

A later reconstruction of the flight, which only lasted 55 seconds and traveled a horizontal distance of 7 km, calculated an [average speed](#) of about 800 km/h, thus about 14 km were traveled in total. It is assumed that during the vertical drop, with the engine still firing, Sieber inadvertently also became the first human to break the [sound barrier](#).

Sieber's remains were buried with military honors on [3 March](#) 1945.



Bachem BA 349 "Natter" (Ref. 2)

White guiding rails and strap-on rockets

Technical Data

Wing span	3.6 m
Wing area	3.6 m ²
Overall length	5.72 m
Overall height	2.20 m
Fuselage (height/width)	1.17m / 0.90m
Rudder cross section	2.30 m (in both directions)
T-fuel (perhydrol)	365 liters
C-fuel (methanol and hydrazine hydrate)	165 liters
Propulsion engine	300-1700kp (regulated)
HWK 109-509 (Walter)	
Strap-on solid rockets	4x SG 34 (4x 1200kp)
(Schmidding SG-34)	Length: 1.50 m each
Weight (empty/fueled)	800kg / 1630-2050kg
Speed (max)	1000km/h
Max. climbing height	16.000 m
Take-off acceleration	21,5 m/sec ²
Thrust at take off	4000 PS (horsepower)

The Natter program was proposed and designed in 1944 by Erich Bachem and Willi Achim Fiedler (who worked after the war in America as a designer for the Polaris and Poseidon submarine missiles) based on an idea from Wernher von Braun, developed in 1939, but could not be implemented then because of lack of suitable jet engines. The Natter was conceived as a fast, jet powered "one-way" bomber interception plane with a recoverable, reusable fuselage.

The body of the plane was constructed completely of a wooden frame covered with wood paneling. The cockpit was shielded by a sandwich type armor plate and a 60 mm thick framed bullet proof glass windshield for protection of the pilot. The middle section contained the propellant tanks for C- and T-fuel, the fuel flow regulation system, the fuel pumps as well as the stowed parachute for recovering the fuselage after separation from the cockpit. The rear housed the propulsion system consisting of a Walter HWK 109-509 propulsion motor and burn chamber. Stability was reached by a symmetrical cruciform wooden tail unit.

To facilitate a vertical take-off from a supporting gantry four solid strap-on boosters (one double-pack on each side) were attached to be discarded after 10 seconds into flight.

The operating concept was to make a fast interception of any detected bombers approaching strategically positioned launch sites (e.g. for protection of industrial complexes). After an (successful) attack of the bombers with small, multiple on-board (R4M) rockets, the rear fuselage would be separated from the cockpit to be recovered by parachute. The pilot would be pulled out of the now open cockpit (no bulkhead between rear fuselage and cockpit) by his parachute to land safely on his own. Only the cockpit would be discarded. The concept had been proven with drag and tow tests, however there was only one successful completely configured dummy flight where the dummy could be recovered intact before the real "manned" attempt.

An exact analysis of the crash has been attempted by various experts and amateurs over the past years but uncertainties still remain because the visible flight phases were rather short and eyewitness reports deviated considerably in some important aspects. In addition, official military reports tried to cover up the fact that an experienced test pilot could not control the vehicle.

The key questions still are: Why did the canopy come off (accidentally or opened by the pilot)? Why did the pilot not try to bail out earlier (because he was hit by the canopy unconscious or because he was instructed or wanted to save the flight by all means)? Did the un-jettisoned, stuck booster play a role in the unfortunate sequence of events?

Although of no consequence for the occurrence of events it remains unclear whether Sieber had radio contact with the ground during his flight – no communication exchange is documented.

Based on my own, personal engineering experience I would offer the following analysis of the events: The fatal outcome of the flight was caused by a combination of technical failure(s) and human underestimation of their potential.

Analyzing the distinguishable flight occurrences the following conclusions could be drawn:

L-1 sec: The Walter propulsion system is started first, than the 4 strap-on boosters by the pilot. It took approximately 1 sec for the Walter engine to built up the full thrust and trigger the automatic clamp release bolts which were activated by direct thrust action on the release mechanism.

L: Lift-off by gliding along the guiding rails on the gantry with dramatically increasing acceleration introduced by a thrust of 4000 horse powers (PS).

L+10 sec: The vehicle reached approximately 700 m when the boosters burned out and fell off except one, which might have imposed an additional angular momentum intensifying the expected roll motion into the reverse flight mode.

L+12 sec: Only seconds after the booster separation the canopy came off either because it was not closed tightly (the later recovered canopy showed the security latch clearly in "open" position) or the pilot opened the canopy to either bail out or because of acrid fumes from the propulsion system might have accumulated in the cockpit (this effect was known from test with Walter propulsion engines used in other

planes) and impaired the pilot by hitting him on the head. In addition the canopy could have damaged one of the wings or the tail end when flying away as a heavy object with high speed.

In both cases the situation of the open cockpit would have aggravated the situation for the pilot being in an extreme situation already and possibly added another disturbing impulse to the dynamic behavior of the plane.

However two eyewitnesses reported that after those two events a half-roll maneuver still occurred rectifying the flight path into a nose-up climb.

L+30 sec: The plane disappeared in a cloud layer with the engines still firing.

L+53 sec: The plane shoots out of the cloud layer in a vertical nose dive and typical out-of-control tailspin.

L+55 sec: The plane hits the ground in full speed

The only logical interpretation of what has happened during the invisible part of the flight is that the plane must have rolled again into the inverted flight position and then yawed into the vertical nose dive. Again the stuck booster might have supported this orientation change, however it is not clear whether the vertical nose dive could have been achieved by the vehicle dynamics alone or was aided (as later speculated) by the disoriented or otherwise impaired pilot.

My own final conclusion is that the double failure (either technical or technical/human) as described above (stuck booster and lost canopy) changed the dynamics of the relatively unstable vehicle in such a way that it slowly started to roll again after the loss of the canopy into an unstable “upright” position (suggesting a perfectly executed half-roll maneuver) and continued in the clouds to roll into an inverted position and then became totally unstable and yawed into the vertical tailspin nose-dive (this was the typical behavior of many unsuccessful rocket starts executed within the early American launch vehicle test programs after the war). This exceeded the pilot’s capabilities (either in full command or impaired) leaving Sieber no realistic chance to recover.

One interesting decision of the responsible Natter design engineers after the crash was, that should another piloted test-flight occur, the climbing phase would have to be controlled completely by the automatic system. In fact the installed, automatic path guidance system, which was disabled during Sieber’s flight, would have been able to do this: A gyro-system, developed by Siemens for other fighter jets was routinely and reliably functioning in other planes.

It was later reported that Sieber considered the flight testing of the Natter his personal challenge and his vision was to help to improve the system to such a state where he would be able to ultimately land the vehicle on a runway.

This legacy became true 36 years later with the first successful human piloted STS-1 Columbia landing on 14 April 1981 by J. Young and R. Crippen in the historic touchdown at Edwards Air Force Base (AFB), California after their spectacular return from space.

References:

- 1) Photo Lothar Sieber; <http://www.swr.de/lsunterwegs/archiv/2003/02/22/index.html>
- 2) Photo Natter; http://www.kheichhorn.de/html/body_natter.html
- 3) More construction details http://www.lonesentry.com/features/f36_image2_natter.html
- 4) http://en.wikipedia.org/wiki/Lothar_Sieber and associated Wikipedia links
- 5) <http://www.kheichhorn.de/html/body-natter.html>
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