

**Final Report
of the Aircraft Accident
Investigation Bureau**

concerning the incident (Airprox)

between SWR345 and F-GLVL

on 27 April 2003

6 NM Final RWY 14, Zurich

FINAL REPORT

AIR TRAFFIC INCIDENT REPORT (ATIR)

AIRPROX (NEAR-MISS)

THIS REPORT HAS BEEN PREPARED FOR THE PURPOSE OF ACCIDENT/INCIDENT PREVENTION. THE LEGAL ASSESSMENT OF ACCIDENT/INCIDENT CAUSES AND CIRCUMSTANCES IS NO CONCERN OF THE INCIDENT INVESTIGATION. (ARTICLE 24 OF THE AIR NAVIGATION LAW)

The masculine form of address also applies to the feminine form where applicable.

PLACE/DATE/TIME

6 NM Final RWY 14, Zurich, 27.4.2003,
07:09 UTC

AIRCRAFT

SWR345, A321, HB-IOI, Swiss
London Heathrow (EGLL) – Zurich (LSZH)

F-GLVL, DR21, Private
Mulhouse/Habsheim (LFGB) – Friedrichshafen (EDNY)

ATC UNIT

Approach Control Office

AIR TRAFFIC CONTROLLERS

CAP (Coordinator Approach)
FINAL (Final Air Traffic Controller)

AIRSPACE

D

HISTORY

For Sunday 27 April 2003, the pilot flying of F-GLVL, together with colleagues from the Aéroclub des Trois Frontières, had planned a flight to Friedrichshafen to visit the Aero event which was taking place there. In all, four aircraft took part in this excursion to Friedrichshafen; all these aircraft were operated by the Aéroclub des Trois Frontières. The four aircraft took off individually and each crew made their flight independently of the others. In addition to the pilot flying, another pilot, who would be flying the aircraft later as the pilot flying for the same-day return flight from Friedrichshafen to Mulhouse/Habheim, was on board F-GLVL.

The crew of F-VLGL completed flight preparations, which among other things included obtaining the necessary meteorological information and determining the route of the flight. According to the weather information received, the flight was possible without any problems. The flight path planned and entered on a Jeppesen VFR+GPS Chart Germany 1:500 000 passed north-east of Basle, via Fricktal-Schupfart aerodrome – TRA VHF omnidirectional radio-range – waypoint Lima (L) to Friedrichshafen. Waypoint L (at the NW end of Lake Überlingen) was activated expressly for the duration of Friedrichshafen Aero.

The pilot flying was aware that the Zurich control zone (CTR) was strictly to be avoided; he was also aware of the altitude restrictions of the various sectors of the Zurich terminal control area (TMA).

In the course of their flight, according to the radar record, the two pilots of F-GLVL flew past the Fricktal-Schupfart aerodrome just to the south on an easterly heading, at an altitude of 4000 ft QNH.

Later the crew of F-GLVL thought they were over Waldshut, from where they made a brief diversion to the south because of low cloud before intending to continue flying in the direction of Schaffhausen.

Actually, however, shortly after Fricktal-Schupfart, F-GLVL flew south of the planned route and began to descend slightly to the west of Brugg. In the process, in the vicinity of Untersiggenthal, it consequently flew over the western boundary of TMA Sector 1 at an altitude of 3500 ft QNH. F-GLVL then continued its flight on an east-north-easterly heading and continued to descend. When it flew over the CTR boundary in the vicinity of Schneisingen, the aircraft was still at an altitude of 3000 ft QNH and approached the axis of the localizer (LOC) of the instrument landing system (ILS) for runway 14.

Throughout this time, F-GLVL was never in contact with a Zurich air traffic services unit.

SWR345 was on a scheduled flight from London to Zurich. It was in contact with the Final air traffic controller (FINAL ATCO), who had brought it to the ILS of runway 14. At a distance of about 13 NM from the runway threshold, SWR345, on the instructions of the FINAL ATCO, began to turn onto the LOC, in order subsequently to intercept it and follow it. It continued its continuous descent.

At about this time, the ATCO gave it initial traffic information concerning F-GLVL which was approaching from the west. Initially, the flight crew of SWR345 were only able to detect the French Robin on their airborne collision avoidance system (ACAS). After SWR345 had aligned itself on the runway 14 LOC, its flight crew reduced their rate of descent as a precaution, in order to remain at a higher altitude than F-GLVL. Only after the Swiss aircraft passed 3800 ft QNH in its descent did it enter visual meteorological conditions (VMC) and also establish visual contact with F-GLVL.

All times in this report follow the UTC format (Local time – 2 hours)

Shortly afterwards their ACAS issued the preventive resolution advisory (RA) “monitor vertical speed”, with which they complied. In the meantime, F-GLVL was about to intersect the ILS LOC at an altitude of 2900 ft QNH and at a distance of about 6 NM from the threshold of runway 14. At this time the Swiss Airbus was still 0.7 NM from the intersection point and, as a result of the reduced rate of descent, still some 900 ft above the Robin. In this way SWR345 was able to control the situation without having to initiate an evasive manoeuvre. F-GLVL then distanced itself to the east, maintaining its heading.

The ATCOs in the approach control office subsequently continued to monitor the unknown aircraft on radar and were able to establish that the aircraft later landed in Friedrichshafen, where it was identified and made aware of the airspace violation in the Zurich TMA.

Subsequently, both air traffic control (ATC) and Swiss International Airlines submitted an air traffic incident report (ATIR) to the AAIB.

FINDINGS

- Both aircraft were flying in Class D controlled airspace.
- SWR345 was flying under instrument flight rules (IFR); F-GLVL was flying under visual flight rules (VFR).
- SWR345 was in uninterrupted contact with the competent ATC unit “Zurich Final”.
- At the time of the incident F-GLVL was not in radio contact with any air traffic services (ATS) unit.
- At 07:05:33 F-GLVL penetrated TMA Sector 1 approximately over Untersiggenthal at an altitude of 3500 ft QNH, without first making contact with an ATS unit. This TMA sector has a lower altitude limit of 3000 ft QNH.
- At 07:07:17, the FINAL ATCO gave SWR345 traffic information concerning F-GLVL as follows: “SWR345, unknown traffic at your 11 o'clock position, range 5 miles, showing 3000 ft, not verified, crossing right – left, slowly moving”. At this time the two aircraft were a good 5 NM apart. At a distance of 12 NM from the threshold of runway 14 and at an altitude of about 5000 ft QNH SWR345 was about to intercept the LOC; F-GLVL was about to penetrate Zurich CTR at an altitude of 3000 ft QNH on an east-north-easterly heading, approximately over Schneisingen. SWR345 confirmed this message with: “Looking out”.
- At 07:07:44 the FINAL ATCO repeated the traffic information as follows: “SWR345, ... the mentioned traffic still 11 o'clock, 3 miles”. The Swiss flight crew confirmed the message with: “Looking out and starting to reduce”. Shortly thereafter...
- At 07:07:54 SWR 345 stated the following: “But the position must be something like one o'clock..., crossing right to left”. The FINAL ATCO then confirmed this position information and thereby corrected the earlier incorrect position information.
- At 07:08:10 SWR 345 confirmed that it had detected F-GLVL on its ACAS.
- At 07:08:46 SWR345 finally confirmed that it now had “visual contact” with this aircraft, which had in the meantime descended to 2900 ft QNH. The flight crew were also able to refer to the aircraft type, “Robin”, but without being able to read the registration. At this time F-GLVL was on the point of intersecting the LOC in an easterly direction, whilst SWR345, slowly descending on the ILS, was still 0.7 NM from the intersection point.

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- According to a written statement, the pilot of F-GLVL, after passing Fricktal-Schupfart, was maintaining an altitude of about 4000 ft QNH. Then he apparently descended to 3000 ft QNH in order to comply with the altitude restriction for Zurich TMA Sector 1. After he had identified Waldshut, some low cloud had forced him to deviate to the south. After this, he intended to continue flying in the direction of Schaffhausen. According to his statements, the pilot of F-GLVL was aware of both the altitude restrictions of the Zurich TMA sector and of the flight restriction for Zurich CTR.

With regard to his navigational preparation for the flight, the pilot submitted a Jeppesen VFR+GPS Chart Germany 1:500 000, on which the envisaged flight route was marked. In addition, he was using a VOR receiver, which was set to TRA.

During the flight he never had any doubts about the position of F-GLVL and nor did they have any visual contact with the Swiss Airbus, whose flight path they had obviously crossed.

According to his information, after passing Basle, the pilot of F-GLVL had selected the "Zurich Information" frequency (124.700 MHz), but without making contact with this unit.

- According to his written statement, the FINAL ATCO had noticed the initially unknown aircraft (which subsequently proved to be F-GLVL) on its penetration into TMA Sector 1 at the latest. The aircraft presented a 0021 transponder code, which made it unnecessary to coordinate with the flight information centre (FIC), since this code group is used by VFR flights in German airspace and are not known to the FIC. He later issued traffic information to SWR345 which was flying on the ILS. In so doing he initially indicated an incorrect position, which was, however, subsequently clarified in the ensuing dialogue with the Swiss aircraft. SWR345 later reported that it had established visual contact with the unknown aircraft and had identified it as a "Robin" type.

According to his statement, there was no occasion to offer SWR345 an evasive manoeuvre, as the Swiss aircraft reported visual contact with the unknown aircraft.

- The volume of traffic in the FINAL sector was low at the time of the incident.
- Both the air traffic controllers involved and the pilots of SWR345 and the responsible pilot of F-GLVL were in possession of the necessary valid licences for exercising their functions.
- Weather: Weather forecast for Switzerland for 27 April 2003, valid from 06:00 to 12:00:
Between a depression over Scotland and a high over the western Mediterranean cool and somewhat humid air will reach the Alps.

Weather conditions on the route from Fricktal-Schupfart to Trasadingen:

Cloud: 2-3/8, base approx. 3000 ft AMSL and 5-7/8 base approx. 6000 ft AMSL

Visibility: 10-20 km

Wind: West to south-west at 10 kt, gusts to 15 kt.

Atmospheric pressure: QNH LSZH 1017 hPa

Hazards: West wind turbulence.

GAFOR 06:00 to 12:00:

The relevant route 01 (Basle-Schaffhausen) was forecast in GAFOR 06-12 as OOO and in GAFOR 09-15 as DOO.

All times in this report follow the UTC format (Local time – 2 hours)

OAM LSZH 06:50:
Wind: 240°, 9 knots
Ground visibility: 25 KM
Cloud: few at 3200 ft/GND, BKN at 7000 ft/GND
Temperature: 12°C, dewpoint 7°C
QNH 1017 hPa
NOSIG

ANALYSIS

Airmanship

F-GLVL: The pilot flying of F-GLVL completed a flight preparation which would have been appropriate for carrying out the flight successfully. The flight was also possible without any problems on the basis of the weather forecast for the route. Along the envisaged route and the one entered by the pilot on a Jeppesen VFR chart, it was necessary neither to contact a Zurich ATS unit nor to switch on the transponder.

The fact that the pilot of F-GLVL switched on the transponder set to code 0021 and mode A/C and according to his statement was monitoring the "Zurich Information" frequency reflects prudent defensive behaviour which, however, was not able to prevent the conflict.

The flight information centre, for its part, could not make contact with F-GLVL because this flight was not known to it. The same applies to the FINAL ATCO.

The pilot's navigational error reflects a rather limited flying experience of approximately 185 flying hours. In fact, the confluence of the Limmat with the Aare near Lauffohr is easily confused with the confluence of the Aare and the Rhine near Koblenz. This confusion clearly occurred in the present case.

Air traffic control

FINAL: With regard to the initially unknown F-GLVL, the FINAL ATCO first issued traffic information to SWR345 when F-GLVL was on the point of flying into Zurich CTR and SWR345 was simultaneously preparing to intercept the LOC of ILS 14. At this time the aircraft were a good 5 NM apart and were converging at an acute angle.

Only 53 seconds later did SWR345 report that it had detected the aircraft on its ACAS display and a further 36 seconds passed before it reported visual contact with F-GLVL; at this time the two aircraft were less than 1 NM apart. In the meantime the FINAL ATCO suggested that SWR345 remain somewhat above F-GLVL in order to avoid it.

In handling this traffic situation the ATCO was clearly relying on the fact that the Swiss flight crew would perform any necessary evasive manoeuvre on the basis of their ACAS display and therefore dispensed with offering SWR345 an early evasive manoeuvre.

The ATCO's initially incorrect position indication led to a delay in the Swiss flight crew detecting F-GLVL; this was made even more difficult by unfavourable weather conditions.

In principle, when deciding whether an evasive manoeuvre should be offered, ATC should involve any onboard ACAS equipment only with great reticence.

Radio contact and use of transponder

On F-GLVL's planned route, the pilot was not subject to any obligation to make radio contact with a Zurich ATS unit. Nor was F-GLVL required to switch on its transponder. The radar position symbol of F-GLVL on the radar displays in ATC did at least make it possible for the latter to issue traffic information to the approaching SWR345. Radio contact by F-GLVL with an ATS unit would have further alleviated the conflict.

CAUSE

The incident is attributable to the fact that the pilot of F-GLVL made an error in terrestrial navigation. As a result, he accidentally penetrated TMA Sector 1 and, a little later, Zurich CTR.

The lack of radio contact with a Zurich ATS unit, although it was not prescribed on the planned route, prevented any intervention by air traffic services.

SAFETY RECOMMENDATION NR. 272

The Federal Office for Civil Aviation should arrange for all VFR flights in Switzerland to be assigned a transponder code.

Berne, 28 October 2004

Aircraft Accident Investigation Bureau

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All times in this report follow the UTC format (Local time – 2 hours)

**TRANSCRIPT OF TELEPHONY
OR RADIOTELEPHONY COMMUNICATION TAPE-RECORDINGS**

Investigation into the **incident** that occurred on **27 April 2003**

- Subject of transcript: **SWR345**
- Centre concerned: Swiss Radar Area East
- Designation of unit: TCZ
- Frequency / Channel: 125.325 MHz
- Date and period (UTC) covered by attached extract: 27 April 2003
07:04 - 07:10 UTC
- Date of transcript: 14 May 2003
- Name of official in charge of transcription: Franz Fischbach

- Certificate by official in charge of transcription:

I hereby certify:

- That the accompanying transcript of the telephony or radiotelephony communication tape-recordings, retained at the present time in the premises of the Analysis Department, has been made, examined and checked by me.
- That no changes have been made to the entries in columns 2, 3 and 4, which contain only clearly understood indications in their original form.

Zürich, 14 May 2003

On behalf of Franz Fischbach

Bettina Comte

Abbreviations

Sector Designation of sector

FIN - Zurich Final

<u>Aircraft</u>		<u>Callsign</u>		<u>Type of acft</u>	<u>Flight rules</u>	<u>ADEP</u>		<u>ADES</u>
345	-	SWR345	Swiss	A321	IFR	EGLL	-	LSZH
42ML	-	SWR42ML	Swiss	A321	IFR	LSGE	-	LSZH
387	-	SWR387	Swiss	E145	IFR	EGCC	-	LSZH

TRANSCRIPT SHEET

Occurrence: SWR345

Date: 27 April 2003



To <u>Col.1</u>	From <u>Col.2</u>	Time <u>Col.3</u>	Communications <u>Col.4</u>	Observations <u>Col.5</u>
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Frequency: 125.325 MHz Zurich Final

FIN	345	07:04:32	Final "grüezi", SWR 345	
345	FIN	:35	SWR 345, "guete Obig mitenand", turn right heading 090	
FIN	345	:38	Right 090, SWR 345	
345	FIN	:05:01	SWR 345, maintaining two ten, report when you start reduce	
FIN	345	:05	Maintain 210, call you when we are starting to reduce	
345	FIN	:06:05	SWR 345, descend to 4000 feet on QNH 1017	
FIN	345	:09	Descend to 4000, QNH 1017, SWR 345	
FIN	42ML	:18	Final, SWR42ML	
42ML	FIN	:20	SWR42ML, "guete Morge", turn right heading 090	
FIN	42ML	:23	Heading 090, 42ML	
345	FIN	:48	SWR 345, turn right heading 120, cleared the ILS 14	
FIN	345	:53	Heading 120, cleared for approach, SWR 345	
42ML	FIN	:57	SWR42ML, descend to 4000 feet on QNH 1017	
FIN	42ML	:07:02	4000 feet, 1017, SWR42ML	
345	FIN	:17	SWR 345, unknown traffic at your 11 o'clock position, range 5 miles, showing 3000 feet, not verified, crossing right - left, slowly moving	
FIN	345	:28	Looking out	
345	FIN	:37	And 345, no speed restrictions	
345	FIN	:44	SWR 345, no further speed restriction, the mentioned traffic still 11 o'clock, 3 miles	

Signature of person
in charge of transcription:

TRANSCRIPT SHEET

Occurrence: SWR345

Date: 27 April 2003



<u>To</u> <u>Col.1</u>	<u>From</u> <u>Col.2</u>	<u>Time</u> <u>Col.3</u>	<u>Communications</u> <u>Col.4</u>	<u>Observations</u> <u>Col.5</u>
FIN	345	:49	Looking out and starting to reduce	
345	FIN	07:07:53	Roger	
FIN	345	:54	But the position must be something like one o'clock.....*	*unreadable
			crossing right to left	
345	FIN	:08:00	"Äh ja", sorry, of course, one o'clock	
FIN	345	:03	Copied	
345	FIN	:05	And is still one o'clock, range 3 miles, slowing 2800 feet	
FIN	345	:10	We have him on the TCAS	
42ML	FIN	:14	SWR42ML, right heading 120, cleared ILS 14	
FIN	42ML	:17	Heading 120, cleared for approach 14, SWR42ML	
FIN	387	:22	Final, "grüezi", SWR 387	
387	FIN	:23	SWR 387, "guete Morge"	
345	FIN	:32	345, traffic now coming up straight ahead, 1 mile	
FIN	345	:36	"Ouh" and we are becoming IMC	
345	FIN	:38	Okay, do you wish to stay a bit above	
FIN	345	:42	Stand by	
FIN	345	:46	And we have visual contact to the other traffic	
345	FIN	:49	Roger, can you confirm the altitude of about 2900 feet	
FIN	345	:53	Affirm, it's true	
345	FIN	:55	Roger, but there is no chance to see the registration	
FIN	345	:57	A Robin	
345	FIN	:59	Do you said it's a Robin	
FIN	345	:09:02	It's a Robin, affirmative, and we got a TA/RA	
345	FIN	:05	Thank you	
387	FIN	:16	SWR 387, descend to 4000 feet on QNH 1017	

Signature of person
in charge of transcription:

TRANSCRIPT SHEET

Occurrence: SWR345

Date: 27 April 2003



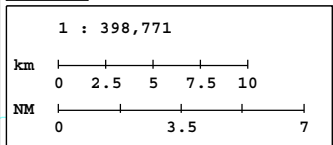
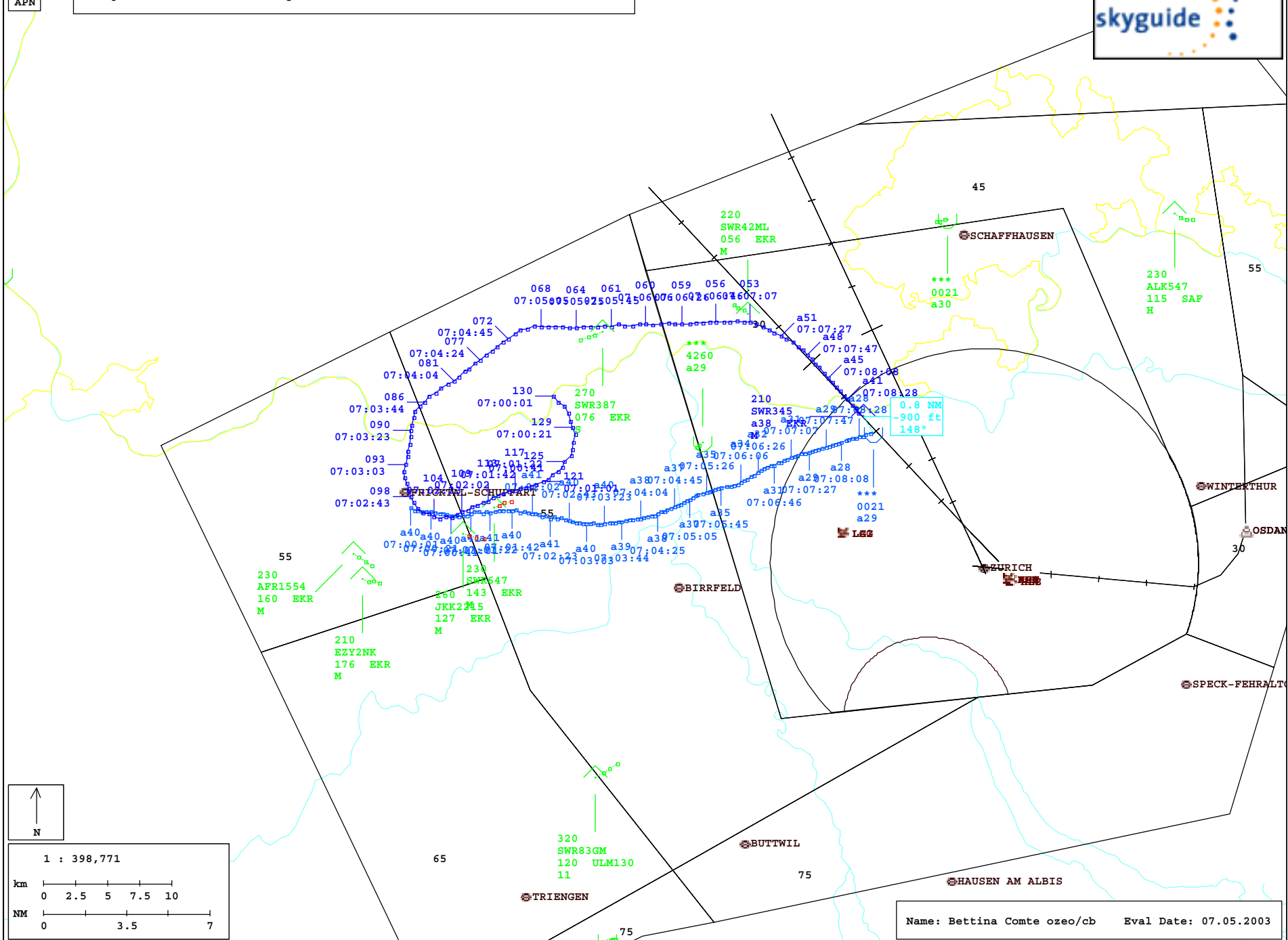
<u>To</u> <u>Col.1</u>	<u>From</u> <u>Col.2</u>	<u>Time</u> <u>Col.3</u>	<u>Communications</u> <u>Col.4</u>	<u>Observations</u> <u>Col.5</u>
FIN	387	:20	Descending 4000 feet, QNH 1017, SWR 387	
345	FIN	07:09:23	SWR 345, you had no chance to see the registration, did you	
FIN	345	:26	Negative, no chance	
345	FIN	:28	Thank you 345, you are number one, contact Tower 118 decimal 1, "adie mitenand"	
FIN	345	:32	"schöne Tag"	
345	FIN	:33	"Danke glichfalls"	

end

there is no radio telephony contact on frequency ZRH FIC 124.700MHz concerning A0021/FGLVL at the moment of the incident

Src
APN

Analysis: AIRPROX SWR345 of april 27, 2003 Time [UTC]: 27.04.2003 07:08:46



Name: Bettina Comte ozeo/cb Eval Date: 07.05.2003

