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Ufficio d'inchiesta sugli infortuni aeronautici UIIA  
Uffizi d'inquisiziun per accidents d'aviatica UIAA  
Aircraft Accident Investigation Bureau AAIB

# **Final Report No. 2075**

## **by the Aircraft Accident**

## **Investigation Bureau**

concerning the serious incident (AIRPROX)  
involving the Cirrus SR20 aircraft, registration HB-KHF  
and the Piper PA-28-181 aircraft, registration HB-PPV  
on 24 June 2008  
approximately 3.5 NM east of Bern-Belp Airport

## General information on this report

This report contains the AAIB's conclusions on the circumstances and causes of the accident/serious incident which is the subject of the investigation.

In accordance with Art 3.1 of the 9<sup>th</sup> edition, applicable from 1 November 2001, of Annex 13 to the Convention on International Civil Aviation (ICAO) of 7 December 1944 and Article 24 of the Federal Air Navigation Act, the sole purpose of the investigation of an aircraft accident or serious incident is to prevent accidents or serious incidents. The legal assessment of accident/incident causes and circumstances is expressly no concern of the accident investigation. It is therefore not the purpose of this investigation to determine blame or clarify questions of liability.

If this report is used for purposes other than accident prevention, due consideration shall be given to this circumstance.

The definitive version of this report is the original in the German language.

All times in this report, unless otherwise indicated, follow the coordinated universal time (UTC) format. At the time of the incident, Central European Time (CET) applied as local time (LT) in Switzerland. The relation between LT, CET and UTC is:  
 $LT = CET = UTC + 2 \text{ hours}$

## Final Report

**Aircraft**

HB-KHF, Cirrus SR20  
Owner and operator: Private

Bern-Belp (LSZB) – Bern-Belp (LSZB)

Type of operation: Training flight, IFR

HB-PPV, Piper PA-28-181  
Owner and operator: Segel- und Motorfluggruppe  
Grenchen [Grenchen gliding and flying club]

Grenchen (LSZG) - Bern-Belp (LSZB)

Type of operation: Private flight, VFR

**Crew**

HB-KHF  
Trainee pilot: French citizen, born 1958  
Flying instructor: Swiss citizen, born 1944

HB-PPV  
Pilot: Swiss citizen, born 1982

**Location**

Approximately 3.5 NM east of Bern-Belp airport

**Date and time**

24 June 2008, 14:24 UTC

**ATS unit**

Bern aerodrome control, control tower TWR

**Air traffic controllers**

Aerodrome controller, aerodrome control ATCO ADC  
Swiss citizen, born 1955

**Airspace**

**D**

## 1 Factual information

### 1.1 History of the flight

On the afternoon of 24 June 2008, the flying instructor made an IFR training flight on a Cirrus SR20 aircraft, registration HB-KHF, with the trainee pilot. According to the flying instructor's statement, the trainee pilot had approximately 15 IFR flying hours' experience on this aircraft type. The flight took off and landed in Bern. The trainee pilot's task was to fly to beacon VOR WIL after take-off and then to make two IFR approaches in Bern.

In the Bern control tower the approach (APP) and aerodrome control (ADC) workstations were each manned by one air traffic controller (ATCO). The traffic volume was average and of elevated complexity. A Beechcraft KingAir, callsign Navchecker 411, was making calibration flights for the new runway 14 instrument landing system, and this increased the workload. The two aircraft involved in the serious incident, as well as Navchecker 411, were on the 121.025 MHz Bern tower (TWR) aerodrome control frequency.

At 14:01:29 UTC, the crew of HB-KHF received clearance from the ADC with the standard departure route SID RAMOK2S (see Annex 1) and at 14:13:24 UTC they received taxiing clearance to runway 14, BRAVO intersection.

At the same time, the pilot of the Piper PA-28, callsign HB-PPV, was on a VFR flight from Grenchen to Bern. He reported to Bern TWR for the first time at 14:15:45 UTC. At this point in time he was flying over the town of Kirchberg at an altitude of 4500 ft AMSL. His intention was to fly via reporting point NOVEMBER into the Bern control zone (CTR) (see Annexes 2 and 3). However, because of the traffic situation, the ADC ATCO instructed him to fly in via reporting points HASLE and ECHO for the left downwind for runway 14. This instruction was confirmed correctly by the pilot of HB-PPV after a brief query.

At 14:17:40 UTC the crew of the Cirrus HB-KHF reported their readiness for take-off to Bern TWR and requested a back track to the start of runway 14; this was approved by the tower. At 14:19:24 UTC, shortly before take-off, the crew of the Cirrus HB-KHF were given traffic information about the inbound Piper HB-PPV by the ADC ATCO: *"Hotel Hotel Foxtrot, VFR traffic about ten miles north-east of the field inbound to... join left downwind runway one four, single engine, keep an eye"*. The crew replied: *"Will do, Hotel Hotel Foxtrot"*. The ADC ATCO then cleared the Cirrus HB-KHF for take-off.

Shortly afterwards, at 14:19:51 UTC, the pilot of HB-PPV was also given traffic information in the form of essential local traffic information (see section 1.6.1) concerning the Cirrus SR20 which was taking off and which would pass through its flight level in a climb in a north-easterly direction: *"Hotel Papa Victor look out for... a... single engine traffic departing runway one four, north-east bound, climbing through your level"*.

The pilot answered that he would keep an eye out for a single-engined aircraft and at the same time reported his position over HASLE at an altitude of 4500 ft AMSL.

At 14:22:08 UTC, the crew of Navchecker 411 received clearance from aerodrome control for a "low go-around" on runway 14. At the same time it was informed via traffic information about the position of the Cirrus and the Piper.

At 14:23:20 UTC the pilot of the Piper HB-PPV received traffic information from the ADC ATCO about the position of the Navchecker 411: *"Hotel Papa Victor keep an eye for a ... twin engine, in a go around runway one four, in a left turn direction north."* The pilot answered: *"Looking out for the twin engine, Hotel Papa Victor, thank you"*.

At 14:23:32 UTC the Navchecker 411 was issued with a second traffic information about the Cirrus which had taken off from Bern and the approaching Piper as follows: *"Navchecker four one one to confirm, we have a Cirrus on ah... two miles east of Bern beacon, three thousand feet, north-east bound, and ah... opposite traffic four miles north-east of the field, four thousand feet for left downwind for runway one four, Piper"*. The crew replied to this information with: *"Yeah roger, looking out"*.

At 14:23:51 UTC the pilot of the Piper HB-PPV reported his position, ECHO, at an altitude of 3800 AMSL. The ADC ATCO then issued the pilot with further essential local traffic information: *"Hotel Papa Victor report on downwind and the advised Cirrus is ah... at your twelve o'clock, range half a mile, three thousand three hundred feet in climb"*. At this time HB-PPV and NB-KHF were roughly on an opposite course. The Cirrus HB-KHF was at an altitude of 3300 ft AMSL, climbing to FL 80.

At 14:24:07 UTC the pilot of the Pilot HB-PPV reported visual contact with the twin-engined Navchecker. According to his statement, he had seen the Navchecker above the line of the horizon at an early stage, but was initially unable to detect the lower-flying Cirrus.

The pilot of the HB-PPV stated that he had seen the opposing aircraft late and was only able to pull slightly on the controls. Shortly before the two aircraft crossed, the flying instructor in the Cirrus HB-KHF saw the opposing aircraft which in his estimation was somewhat higher. He gripped the controls in a reflex action and according to his statement carried out an avoiding manoeuvre to the left and descending slightly.

According to the radar recording, the minimum separation between the two aircraft was a lateral distance of 0.1 NM and an altitude difference of 200 ft, at an altitude of approximately 3500 ft AMSL.

The flying instructor in the Cirrus HB-KHF later stated that the convergence could have been very dangerous if he had not seen the other aircraft shortly before he crossed it. The pilot of the Piper HB-PPV assessed the situation as *"tight"*, since he saw the opposing aircraft so late.

## 1.2 Meteorological information

The following information was provided by MeteoSwiss.

### ***METAR Bern***

*LSZB 241420 VRB02KT 9999 FEW110 BKN150 29/15 Q1017 NOSIG=*

### ***TAF Bern***

*LSZB 241200Z 241322 33005KT CAVOK TEMPO 1320 9999 FEW050 SCT 120=*

*On the basis of the available information, it is possible to conclude that the weather conditions at the time of the incident in the airspace above Bern between 3000 and 4000 ft AGL were as follows:*

*Cloud: 1-2/8 at 11,000 ft AGL. 5-7/8 at 15,000 AGL*

*Weather: -*

*Visibility: over 10 km*

*Wind: 3000 ft AGL: south-west at 15 kt*

*4000 ft AGL: south-south-west at 15 kt*

*Temp./dew point: 3000 ft AGL: 19°C / 10°C*

*4000 ft AGL: 18°C / 02°C*

*Atmospheric pressure: QNH LSZH 1017 hPa, LSZH 1017 hPa, LSZA 1016 hPa*

*Position of the sun Azimuth 251°, elevation 48°*

*Hazards: None detectable*

## 1.3 Aircraft: Cirrus HB-KHF

The Cirrus HB-KHF aircraft was equipped with a TAS (traffic advisory system), type Sky 497. The TAS is used mainly in smaller executive and sports aeroplanes. It shows the pilot, on a screen, aircraft that are flying in the surrounding airspace within a circumference of 6 NM and within an altitude band of plus/minus 9000 ft, if these are equipped with a transponder and have it switched on. In the event of a possible risk of collision, an audio alert "traffic, traffic" is generated in addition to the corresponding symbol on the screen.

Unlike a TCAS (traffic collision avoidance system), no avoiding manoeuvres (resolution advisories – RA) are generated on the TAS.

After the Cirrus HB-KHF took off and shortly after it turned onto the standard departure route SID RAMOK2S in the direction of intersection ZB520, the crew received a TAS indication on the multifunction display in the cockpit and at the

same time the audio alert: *"traffic, traffic"*. According to the flying instructor's statement, this made him aware that an aircraft was dangerously close.

Both pilots then scanned the airspace. About 20 seconds after they had been made aware by the TAS, they saw the aircraft flying towards them.

The flying instructor saw the aircraft in approximately the "one o'clock" direction, somewhat higher. In a reflex action, he pushed on the controls and initiated a slightly downward left turn.

When the two aircraft crossed, the crew of the Cirrus HB-KHF felt the turbulence caused by the Piper HB-PPV passing above them. At this time, the right door on the Cirrus disengaged from the lock and remained slightly open. This caused the crew to abort the flight and return to Bern. A few minutes later the aircraft landed in Bern-Belp without further incident.

#### **1.4 Aircraft: Piper PA-28 HB-PPV**

The Piper HB-PPV aircraft was equipped with a Mode S transponder. The latter was switched on in A/C mode with Code 7000.

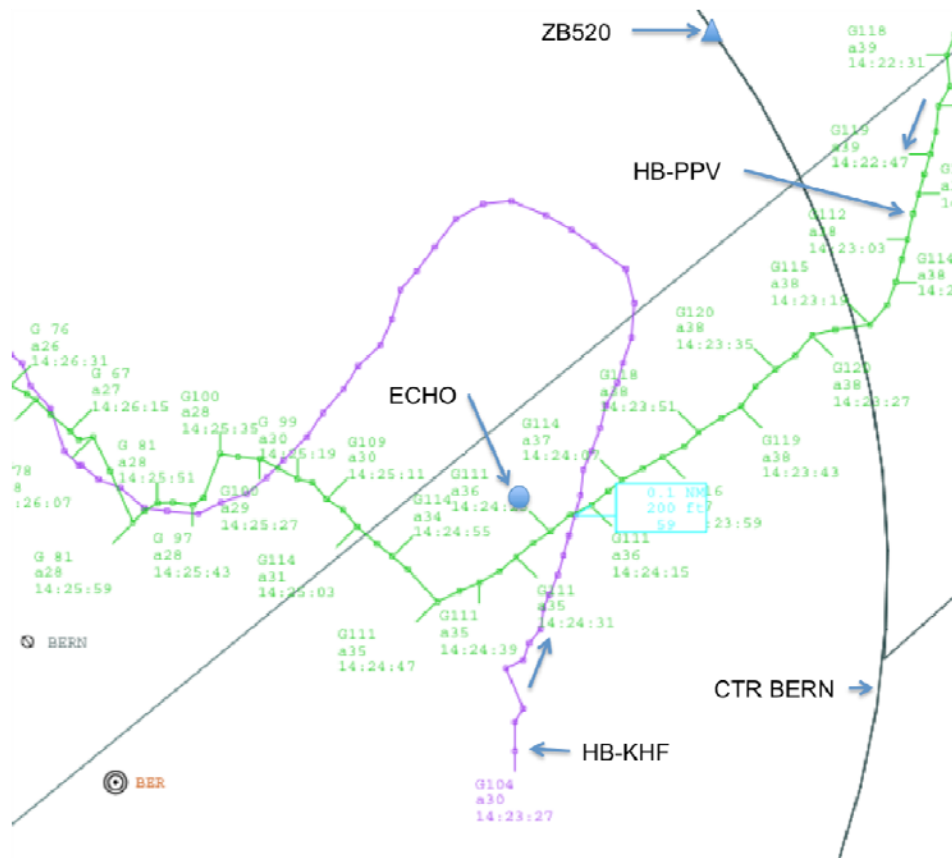
The pilot was following the approach route instructed by Bern Tower, which was via reporting points HASLE and ECHO. At 14:19:51 UTC, when over HASLE, approximately 4 minutes before the serious incident, he received the first traffic information about the Cirrus HB-KHF taking off from Bern. According to his statements, it was clear that an aircraft would be flying towards him. He then intensified his monitoring of the airspace.

After the traffic information from the ADC ATCO concerning the position of the Navchecker 411, the pilot located the Beechcraft KingAir relatively early above the line of the horizon. He was unable to detect the second aircraft, the Cirrus HB-KHF, which was lower. At reporting point ECHO, he received the second traffic information from the ADC ATCO concerning the Cirrus, which was half a mile in front of him on an opposite heading. Shortly afterwards, the pilot of the Piper HB-PPV saw the Cirrus. He realised that the aircraft would fly under his aircraft and pulled a little on the controls to increase the vertical separation.

#### **1.5 Air traffic control**

Bern aerodrome control is equipped with a Tower Air Situation Display (TASD). The radar data for the TASD is supplied by the Zurich Multi Radar Tracker (MRT). The ATCO possessed a rating for approach radar air traffic control. According to Bern Tower regulations it was within the ADC ATCO's discretion to provide radar services.

According to the radar recording, the Cirrus HB-KHF was first displayed on the TASD at 14:23:27 UTC at an altitude of 3000 ft AMSL, while the Piper HB-PPV was already visible above Kirchberg at the time of the first call. When HB-KHF was first displayed, the Piper HB-PPV was still about 4.5 NM away from reporting point ECHO.



**Figure 1: Sketch of the flight paths of HB-KHF and HB-PPV. Reporting point HASLE is outside the CTR north-east of ECHO.**

According to his statement, the ADC ATCO had routed the Piper HB-PPV via reporting points HASLE and ECHO because of the Navchecker 411 calibration flight.

The time span between the take-off of the Cirrus HB-KHF from Bern at 14:20 UTC and the serious incident was approximately 5 minutes.



## 1.6 Collision avoidance

### 1.6.1 Air traffic control

The serious incident occurred in the Bern CTR in class D airspace. In this airspace separation between IFR flights is guaranteed. Traffic information is issued to IFR/VFR and VFR/VFR flights. Air traffic control provides avoidance recommendations at the pilot's request.

In the Air Traffic Management Manual Switzerland (ATMM), the following information relevant to the ATCO is listed, among other things:

#### *1.2 CLEARANCES AND INFORMATION (Ref: Section 9)*

*Issue information and clearances to aircraft under your control to achieve a safe, orderly and expeditious flow of air traffic on the aerodrome and in the vicinity of the aerodrome, with the objective of preventing collision(s) between:*

- a) aircraft flying in the aerodrome traffic circuits around an aerodrome;*
- b) aircraft operating on the manoeuvring area;*
- c) aircraft landing and taking off;*
- d) aircraft and vehicles operating on the manoeuvring area;*
- e) aircraft on the manoeuvring area and obstructions on that area.*

*Maintain a continuous watch on all visible flight operations on the aerodrome and in the vicinity of the aerodrome, including aircraft, vehicles and personnel on the manoeuvring area, and control such traffic in accordance with the procedures described herein and in local instructions.*

#### *4.7 ESSENTIAL LOCAL TRAFFIC INFORMATION (Ref: Section 9)*

*Due to the restrictive space on and around manoeuvring areas and restricted view from the flight deck it is essential that traffic information be issued to aircraft to assist with collision avoidance.*

*Transmit, without delay, information on known essential local traffic to departing and arriving aircraft. Require APP to issue direct information to aircraft on essential local traffic under its responsibility when, in your judgement, such information is necessary in the interest of safety, or when requested by the flight crew.*

*Describe essential local traffic in a clear, concise and complete manner so as to facilitate recognition.*

*Note: Essential local traffic consists of any aircraft, vehicle or personnel, on or near the manoeuvring area, or traffic operating in the vicinity of the aerodrome, which may constitute a hazard to the aircraft concerned.*

### 1.6.2 The 'see-and-avoid' principle

Regardless of whether he is on a VFR or IFR flight, under visual meteorological conditions (VMC), the pilot is responsible for collision avoidance according to the see-and-avoid principle as per ICAO, Annex 2. Flights according to instrument

flight rules must be separated by ATC or provided with information relating to collision avoidance.

*Avoidance of collisions (Ref. ICAO Annex 2 Section 3.2)*

*Note.— It is important that vigilance for the purpose of detecting potential collisions be not relaxed on board an aircraft in flight, regardless of the type of flight or the class of airspace in which the aircraft is operating, and while operating on the movement area of an aerodrome.*

#### 1.6.3 Pilot

Art. 16 1bis of the traffic rules states the following:

*"If two aircraft are converging on opposite or approximately opposite headings and if there is a danger of collision, both pilots must avoid it by turning right."*

#### 1.6.4 The fundamentals of visual airspace monitoring

Early visual detection by a pilot of an aircraft flying in the same airspace depends on the following factors:

- a properly functioning capability for accommodation and binocular vision. Accommodation is the ability to adjust the refractive power of the eye in order to be able to see objects at different distances sharply. Binocular vision enables a pilot to correctly estimate the heading of the aircraft concerned and the distance in relation to himself. Both functions are subject to physiological limits.
- atmospherically determined transparency. For example, with clear visibility the maximum distance for detecting an aircraft with a 30 m wing span is 14 km. This distance may be considerably reduced with reduced transparency.
- the latency time between visual detection by the retina and realisation by the brain (approximately 3 s).
- the speed of both aircraft. For example if an aircraft were to emerge descending from cloud at a speed of 900 km/h at a distance of 100 m, the pilots, given the above-mentioned latency time of 3 s, would not have enough time to detect each other and react accordingly.
- contrast against the background (e.g. close to the ground).
- pilot distraction due to monitoring instruments or concentration on a specific flying manoeuvre (e.g. approach).
- field of vision, restricted, e.g. by the frame of spectacles or the cockpit window frame.

## 1.7 Standard departure route SID RAMOK2S

Departure route *RAMOK TWO SIERRA* is defined as follows, according to the AIP Switzerland:

*PROCEDURE DESIGN GRADIENT (PDG) 7% TO 3500FT.*

*Climb on track 124, but not before the departure end of runway 14 (DER14).*

*At 2600ft turn left (CAT A: MAX IAS 120KT, MNM BANK ANGLE 15° / CAT B & C: MAX IAS 180KT, MNM BANK ANGLE 25°) Establish TR358 to intercept R223 WIL (QDR 043 BER). Proceed to RAMOK.*

*Cross ZB520 at 5500ft or above, RAMOK at 6000ft or above.*

*INITIAL CLIMB CLEARANCE FL80.*

## 1.8 Transponder procedures

In class D airspace the regulations for transponder procedures according to AIP RAC 4-0-5 read as follows: "The transponder may be switched on only in accordance with instructions from the air traffic control unit."

## 1.9 Additional information

### 1.9.1 Crews

The flight instructor on the Cirrus HB-KHF and the pilot of the Piper HB-PPV had been trained as air traffic controllers.

### 1.9.2 Cirrus door lock

According to the pilot, after the serious incident the door again disengaged from the locking system on the same day. It was possible to remedy the problem after the door mechanism was adjusted by the maintenance company.

## 2 Analysis

### 2.1 History of the flight of the Cirrus SR20, HB-KHF

Before the Cirrus HB-KHF took off, the crew received traffic information from the ADC ATCO concerning a single-engined aircraft flying from the north-east under visual flight rules; at this point in time it was still approximately 10 NM from the aerodrome. This early information was appropriate, as the IFR departure crossed the VFR approach route and a possible conflict was looming, given the chronological sequence.

The flying instructor, who had previously worked as an air traffic controller in Bern Tower, was able to get a good overview of the traffic situation from the traffic information and the ongoing radio conversations.

The TAS installed in the aircraft proved to be beneficial. About 20 seconds before the two aircraft crossed, it made the pilots aware of the conflict by means of an alert and enabled them to locate the converging aircraft shortly before they

crossed and to initiate an avoiding manoeuvre. This alert was only triggered because the transponder on the opposing Piper HB-PPV aircraft was switched on.

When the two aircraft crossed, the crew of the Cirrus HB-KHF felt the turbulence caused by the Piper HB-PPV passing above them. It must remain an open question whether the release of the right entry door from the lock was due to the pressure of the turbulence from the aircraft crossing or to the avoiding manoeuvre initiated by the crew.

## **2.2 History of the flight: Piper PA-28 HB-PPV**

The pilot of the Piper HB-PPV had been instructed by the ADC ATCO to enter the Bern CTR via HASLE and ECHO.

Initial early traffic information concerning the Cirrus HB-KHF which had taken off from runway 14, was received by the pilot of the Piper HB-PPV at reporting point HASLE. When the Navchecker 411 was going around on runway 14, the pilot of the Piper HB-PPV was also correctly informed about this. This traffic information enabled him to carry out selective monitoring of the airspace.

He was then able to locate the twin-engined Navchecker 411, as it was flying above the line of the horizon. The pilot was aware that another aircraft was en route in the opposite direction to his aircraft. He intensified monitoring of the airspace, but was initially unable to establish any visual contact. Only when the ADC ATCO issued essential local traffic information to him with heading and distance to the converging aircraft was he able to detect the Cirrus and initiate an avoiding manoeuvre, though only just before the two aircraft crossed.

## **2.3 Traffic information issued by ATC**

Issuing traffic information to the two flight crews was in this case an important precondition for making the pilots aware of a possible conflict. The sequence of events, with the approach and flight route of the Piper HB-KHF and the time of the take-off of the Cirrus HB-PPV meant that the aircraft could be expected to cross in the vicinity of reporting point ECHO.

The ADC ATCO issued the first traffic information to the crew of the Cirrus HB-KHF, concerning the approaching Piper HB-PPV, when the aircraft was on the ground at the take-off position. His concern was to inform the crew at an early stage and without other additional instructions. He did not issue further traffic information to HB-KHF. According to the ATCO's statement, in principle and according to procedures in the tower environment, traffic information is issued only once and no update is provided. In addition, he stated that aircraft on standard instrument departure route SID RAMOK2S were only visible on the TASD above approximately 3000 to 3500 ft AMSL.

The statement that traffic information is issued only once as a matter of principle is not comprehensible. In this case, further traffic information issued to the pilots of the Cirrus HB-KHF after take-off would have been appropriate, because none of the crews concerned had reported visual contact with the other aircraft. Even if the aircraft had not yet become visible on the TASD, information concerning the position and altitude of the Piper HB-PPV, which had been visible on the

TASD since its approach, would have been useful to the crew of the Cirrus HB-KHF for location purposes and as a complement to the TAS alert.

Both crews would have had the option of requesting an avoidance recommendation from Bern Tower when it became clear that the traffic information provided by the ATCO were not sufficient to locate the converging aircraft.

According to the radar recording, the position of the Cirrus HB-KHF was first displayed at 14:23:27 UTC at an altitude of 3000 ft AMSL and then regularly updated on the TASD.

At 14:23:51 UTC the position report concerning the Piper HB-PPV diverted the ADC ATCO's attention to reporting point ECHO. He then issued the pilot of the Piper HB-PPV with the current position, direction, distance and altitude of the closing Cirrus. However, the latter was only half a mile away and was passing 3300 ft AMSL in a climb. There was no longer sufficient time to issue traffic information to the Cirrus HB-KHF.

The flight programme of the Navchecker 411 caused additional complexity for the ADC ATCO. He had to keep the pilots of the two aircraft involved in the serious incident, plus the crew of the Navchecker 411, continuously informed about the position of the aircraft in potential conflict. Between 14:19:24 UTC and 14:23:57 UTC the ADC ATCO issued traffic information a total of six times.

## 2.4 The 'see-and-avoid' principle

The concept applied in the present serious incident was based on the 'see-and-avoid' principle which is usual in the environment of an aerodrome with air traffic control and with IFR and VFR traffic.

However, application of this principle is subject to certain limitations. In this case, these are primarily: The limits on the pilot's vision, the airspace observation method – scanning –, the workload in the cockpit, the size of the converging aircraft, the position of the sun, the background of the area being scanned and visibility conditions.

The physical capabilities of the human eye are such that despite thorough scanning there is no guarantee of being able to locate an aircraft. The effectiveness of vision can be improved by specific training, to partially compensate for the limitations of human vision.

It should be noted that it is fundamentally difficult to detect converging aircraft, because of their attitude.

In the present case an attempt was made to resolve the conflict on the basis of the see-and-avoid principle. A dangerous convergence occurred despite the following favourable conditions:

- The flying instructor on the Cirrus HB-KHF was acquainted with the environment of the aerodrome.

- The flying instructor on the Cirrus HB-KHF and the pilot of the Piper HB-PPV had a good overview of the traffic situation – situational awareness—based on their professional activity.
- On the basis of the traffic information received from the tower, both crews were aware that their flight paths would cross.
- The Cirrus HB-KHF was equipped with a TAS, which also generated a corresponding alert.
- The two flight crews scanned the airspace intensively for the converging aircraft, but were able to detect it only shortly before they crossed.

## **2.5 Standard departure route SID RAMOK2S**

The flight path of standard departure route SID RAMOK2S takes a left turn to the north once 2600 ft AMSL has been reached. This geographically intersects with the VFR approach routes from the north and east, in the area of reporting point ECHO.

In the case of aircraft with a relatively slow rate of climb, there is the possibility, as in the present serious incident, that the IFR SID will transit the altitude band of aircraft approaching under VFR. The maximum altitude within Bern CTR for VFR aircraft is set at 4500 ft AMSL, and the circuit altitude is set at 3000 ft AMSL. The serious incident occurred at an altitude of approximately 3500 ft AMSL, whilst the Cirrus HB-KHF was climbing and the Piper HB-PPV was descending.

Segregating IFR and VFR routes could prevent such situations.

## **2.6 Transponder use in class D airspace (CTR)**

Within class G and class E airspace below 7000 ft AMSL, provided that the aircraft is equipped with a functioning transponder, pilots are obliged to switch the latter to Code 7000 Mode A/C or Mode S. The pilot of the Piper HB-PPV did this correctly on take-off from Grenchen.

Nonetheless, it would not have been mandatory under the regulations to switch on the transponder in the Bern CTR. However, because the transponder on the Piper HB-PPV was switched on, the ADC ATCO was able to use the information from the Tower Air Situation Display (TASD) to identify the aircraft and provide the pilot of the Piper with accurate position information concerning the converging Cirrus HB-KHF. This helped the pilot to locate the aircraft and initiate an avoiding manoeuvre.

Because the transponder on the Piper HB-PPV was switched on, the Piper was perceived by the onboard TAS on the Cirrus HB-KHF as an intruder and an alert was triggered. Approximately 20 seconds later, the crew were able to make visual contact with the Piper and also initiate an avoiding manoeuvre.

The fact that the transponder on the Piper HB-PPV was switched on made a considerable contribution to easing the impending conflict.

The use of a transponder within a CTR has played a role in several serious incidents investigated by the AAIB. Current regulations do not prescribe general use of a transponder in the CTR.

AAIB Investigation Report No. <sup>1</sup>	Aircraft involved	Date of incident
A045	HB-PHW / CRX169	26 April 2002
1817	SWR345 / F-GLVL	27 April 2003
1975	DWT 501 / HB-CIG	29 April 2005

One example is a serious incident within the Bern CTR (AAIB No. 1975). Before take-off from Bern on a VFR flight, on his own initiative the pilot switched on the transponder set to code 7000 in A/C mode. If the aircraft had flown without the transponder set, the crew of flight DWT 501 would have had no possibility of detecting the impending conflict on their TCAS and taking appropriate avoiding action.

Consistent activation of the transponder in aircraft equipped with one could contribute to improving safety even within a CTR.

### 3 Conclusions

#### 3.1 Findings

- The crews of the aircraft involved in the incident and the ADC ATCO were in possession of the necessary licences.
- The serious incident took place in the Bern CTR, in class D airspace.
- The Cirrus HB-KHF was making a Bern – Bern IFR training flight and was following departure route RAMOK2S.
- The Piper HB-PPV was on a VFR flight from Grenchen to Bern and was cleared by the ADC ATCO to enter the Bern CTR via HASLE – ECHO.
- Before take-off, HB-KHF received traffic information from the ADC ATCO; HB-PPV was informed via essential traffic information concerning the aircraft flying towards it.
- Both crews detected the opposing aircraft shortly before they crossed and were able to initiate an avoiding manoeuvre as a reflex action.
- According to the radar recording, the two aircraft crossed at an altitude of approximately 3500 ft AMSL with a lateral distance of 0.1 NM and an altitude difference of 200 ft.

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<sup>1</sup> The AAIB AIRPROX reports are filed at [http://www.bfu.admin.ch/en/dokumentation\\_berichte.htm](http://www.bfu.admin.ch/en/dokumentation_berichte.htm) .

- The Cirrus HB-KHF was equipped with a TAS, which triggered an alert.
- The volume of traffic was average and of elevated complexity.
- The IFR departure route RAMOK2S crossed the VFR approach route via ECHO.
- Visual flight conditions prevailed, with in excess of 10 km visibility.

### 3.2 Cause

The serious incident is attributable to the fact that both flight crews were late in detecting the opposing aircraft.

The following factors contributed to this:

- the limitations of the 'see-and-avoid' principle.
- the intersecting IFR standard departure route RAMOK2S and the VFR approach route via ECHO.

## 4 Safety recommendations and measures taken since the incident

### 4.1 Safety recommendations

#### 4.1.1 Safety deficit

On the afternoon of 24 June 2008, a flying instructor was making an IFR training flight with a trainee pilot on a Cirrus SR20. The trainee pilot's task was to fly to beacon VOR WIL after take-off from Bern and then to make two approaches in Bern. Bern Tower assigned standard departure route SID RAMOK2S to the flight; this is routed to VOR WIL via reporting point ZB520.

At the same time, a pilot in a Piper PA-28, registration HB-PPV, was on a visual flight from Grenchen to Bern. Clearance to enter the Bern CTR via reporting points HASLE and ECHO was issued by Bern Tower. When the pilot entered the CTR, he left the transponder switched on and set to code A7000. The fact that the transponder on HB-PPV was switched on made a considerable contribution to easing the impending conflict.

Since it was foreseeable that the flight paths of the two aircraft would cross, traffic information was issued to the crews by Bern Tower. The traffic concept applied was based on the 'see-and-avoid' principle which is usual in the environment of an aerodrome with air traffic control and with IFR and VFR traffic.

Despite this information and despite intensive scanning by the crew for the converging aircraft, a dangerous convergence occurred: according to the radar recordings the minimum separation was a lateral distance of 0.1 NM and an altitude difference of 200 ft. The serious incident occurred at an altitude of approximately 3500 ft AMSL, whilst the Cirrus SR20 was climbing and the Piper PA-28 was descending.



#### 4.1.2 Safety recommendation no. 418

The FOCA should arrange for the inclusion in the pilot training curriculum of a module with the objective of highlighting the limitations of the 'see-and-avoid' principle.

#### 4.1.3 Safety recommendation no. 419

The FOCA should ensure that the IFR routes are separated from the VFR routes in the Bern CTR.

The AAIB has already issued safety recommendation no. 399 to this effect, in February 2008.

#### 4.1.4 Safety recommendation no. 420

The FOCA should ensure that the existing obligation for the use of the transponder in class G and class E airspace is extended to class D airspace within the control zones.

Payerne, 26 May 2010

Aircraft Accident Investigation Bureau

This report contains the AAIB's conclusions on the circumstances and causes of the accident/serious incident which is the subject of the investigation.

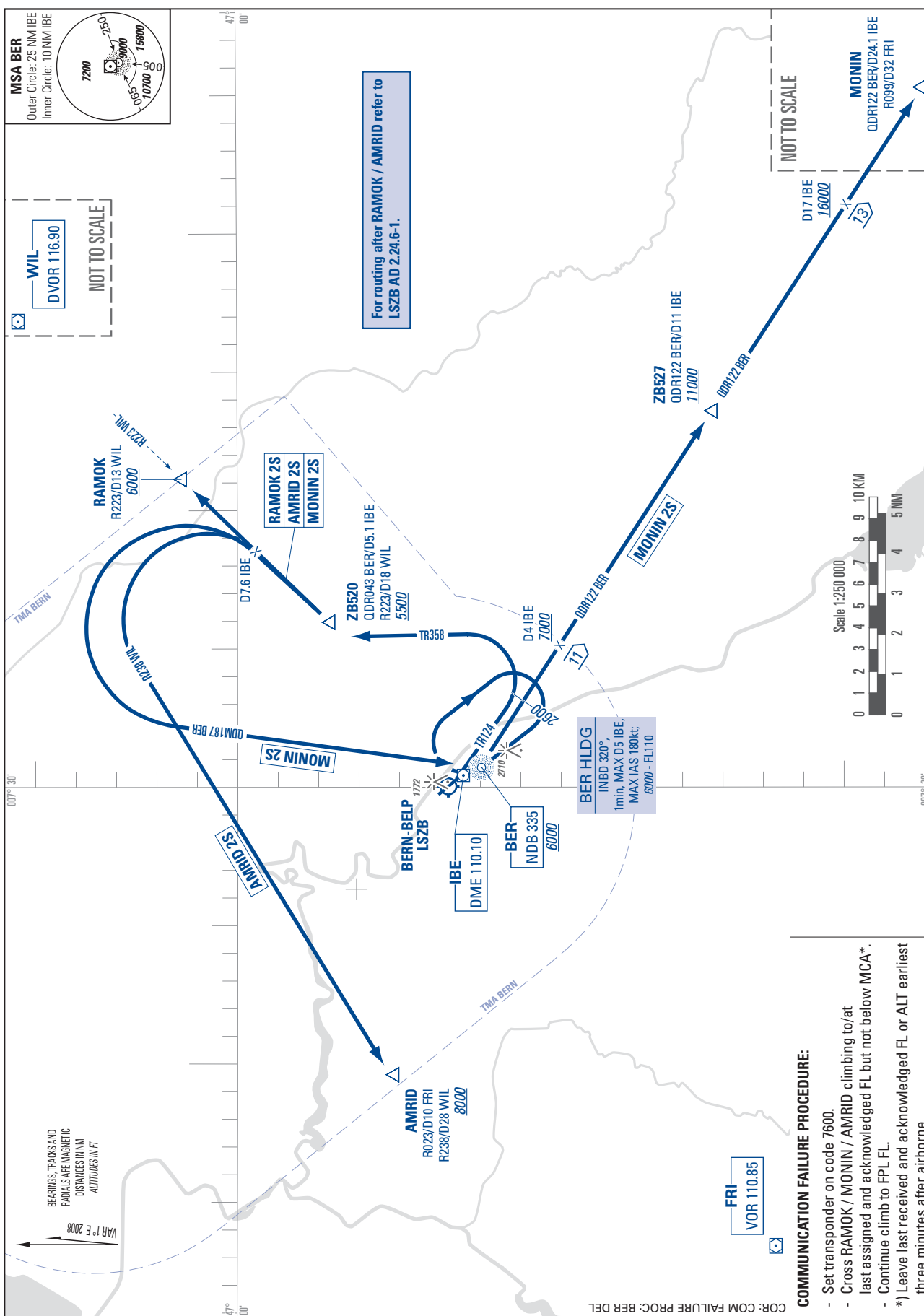
In accordance with Art 3.1 of the 9<sup>th</sup> edition, applicable from 1 November 2001, of Annex 13 to the Convention on International Civil Aviation (ICAO) of 7 December 1944 and Article 24 of the Federal Air Navigation Act, the sole purpose of the investigation of an aircraft accident or serious incident is to prevent accidents or serious incidents. The legal assessment of accident/incident causes and circumstances is expressly no concern of the accident investigation. It is therefore not the purpose of this investigation to determine blame or clarify questions of liability.

If this report is used for purposes other than accident prevention, due consideration shall be given to this circumstance.

STANDARD INSTRUMENT DEPARTURE CHART  
(SID) - ICAO

TRANSITION LEVEL by ATC  
TRANSITION ALTITUDE 6000

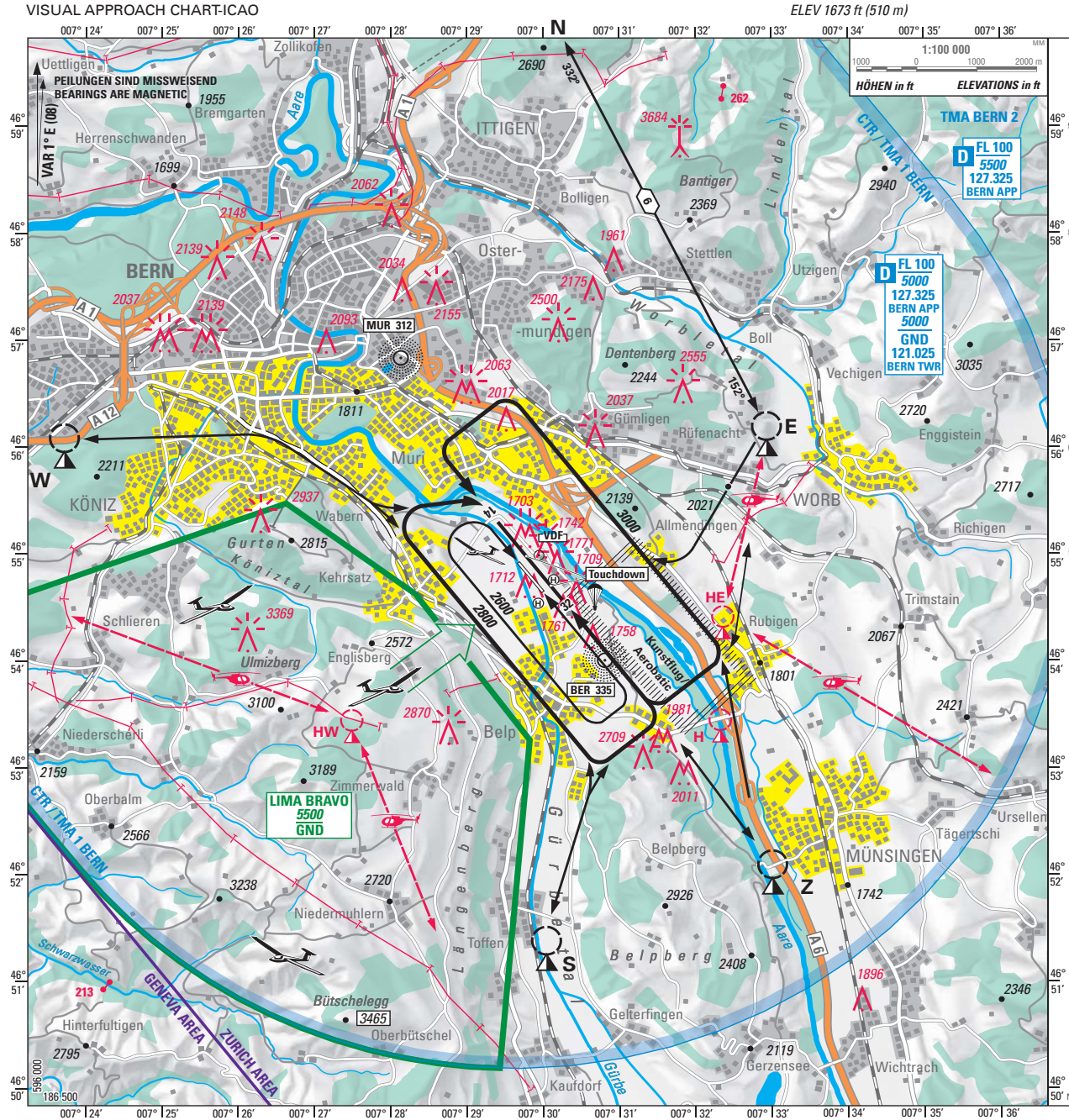
BERN-BELP LSZB  
SID RWY 14 - NON RNAV







SICHTANFLUGKARTE-ICAO  
VISUAL APPROACH CHART-ICAO



ATIS	125.125		
TWR / VDF	121.025	119.700	121.500
APP / VDF	127.325		

**BERN-BELP**  
**LSZB**

**ATIS BERN abhören** (ATIS Kennung bestätigen)  
**MNT BERN ATIS** (confirm ATIS designator)

**ARR / DEP LSZB: TMA BERN 1 + 2 meiden**  
**avoid TMA BERN 1 + 2**

**Beim Anfordern einer Startfreigabe muss der vorgesehene Flugweg (z.B. ready for departure ECHO-HASLE) angegeben werden.**

**Das Verlassen der CTR muss gemeldet werden (z.B. leaving CTR direction HASLE).**

**When ready for departure transmit outbound route (e.g. ready for departure ECHO-HASLE).**

**Report when leaving CTR**

**(e.g. leaving CTR direction HASLE)**

**MAX ALT innerhalb CTR:**

**MAX ALT within CTR:**

**4500**



**Obligatorisch nur für Anflug**  
**Compulsory for ARR only**

**N** 47° 01' 22" N / 007° 28' 48" E **WIL R242 / D19.8**  
**E** 46° 56' 11" N / 007° 33' 12" E **WIL R225 / D20.5**  
**Z** 46° 52' 05" N / 007° 33' 11" E **WIL R218 / D23.6**  
**S** 46° 51' 15" N / 007° 30' 02" E **FRI R067 / D12.3**  
**W** 46° 55' 59" N / 007° 23' 41" E **FRI R037 / D11.7**

**HEL Routen**  
**HEL routes**



**HEL REP; obligatorisch nur für Anflug**  
**compulsory for ARR only**

**HE** 46° 54' 26" N / 007° 32' 16" E **WIL R223 / D22.2**  
**H** 46° 53' 22" N / 007° 32' 15" E **WIL R222 / D23**  
**HW** 46° 53' 21" N / 007° 27' 23" E **FRI R055 / D11.7**

**Lärmempfindliche Gebiete**  
**Noise sensitive areas**

**Höhen über Meer in ft; Höhen über Grund in ft**  
**Altitudes in ft; Heights in ft**

**LIMA BRAVO 5500 GND**

**Einflug verboten wenn aktiv**  
**Entering prohibited when ACT**

**Transition Level: by ATC**

**Funkausfallverfahren:**

**→ LSZB AD INFO 11 § 1.6**

**RDO failure procedure:**

**COR: Completely revised**

## TRANSCRIPT OF TELEPHONY OR RADIOTELEPHONY COMMUNICATION TAPE-RECORDINGS

Investigation into the **incident** that occurred on **24.06.2008**

- Subject of transcript:	<b>HBKHF / HBPPV</b>
- Centre concerned:	Swiss Radar Area East
- Designation of unit:	Bern Tower
- Frequency / Channel:	121.025 MHz
- Date and period (UTC) covered by attached extract:	24.06.2008 14:01:22 - 14:40:36 UTC
- Date of transcript:	21 July 2008
- Name of official in charge of transcription:	skyguide Safety Reporting & Investigation Management

- Certificate by official in charge of transcription:

We hereby certify:

- That the accompanying transcript of the telephony or radiotelephony communication tape-recordings, retained at the present time in the premises of the Safety Reporting & Investigation Management Department, has been made, examined and checked by one of its experts.
- 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, 21 July 2008

skyguide  
Safety Reporting & Investigation Management

## Abbreviations

Sector                      Designation of sector

ADC            -    Bern Tower

<u>Aircraft</u>	-	<u>Call sign</u>	<u>Type of aircraft</u>	<u>Flight rules</u>	<u>ADEP</u>	-	<u>ADES</u>
HHF	-	HBKHF	SR20	IFR	LSZB	-	LSZB
HDL	-	HB?DL	-	VFR	xxxx	-	LSZB
NAV4	-	Navchecker 411	-	-	xxxx	-	xxxx
HHV	-	HB?HV	-	VFR	xxxx	-	LSZB
HEZ	-	HBHEZ	AS202	VFR	LSZB	-	LSZB
SUI	-	SUI003	-	-	xxxx	-	LSZB
RUAG	-	RUAG Maintenance	-	-	-	-	-
HPT	-	HBPPT	PA28	VFR	LSZB	-	xxxx
NAV3	-	Navchecker 311	-	-	-	-	-
HPV	-	HBPPV	PA28	VFR	LSZG	-	LSZB
HPQ	-	HBXPQ	B06	VFR	xxxx	-	LSZB

SRO / 21.07.2008

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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: Bern Tower 121.025 MHz**

HHF	ADC	14:01:22	Hotel Bravo Kilo Hotel Foxtrot, ready to copy clearance?	
ADC	HHF	:26	Affirm, Hotel Bravo Kilo Hotel Foxtrot.	
HHF	ADC	:29	Hotel Hotel Foxtrot cleared to Bern via RAMOK two Sierra departure, transition Juliet seven one, climb to flight level eight zero and squawk six two three zero.	
ADC	HHF	:43	Cleared to Bern via... RAMOK two Sierra departure and ah... Juliet seven one, flight level eight zero, squawk six two three zero, Hotel Hotel Foxtrot.	
HHF	ADC	:54	Read back correct.	
ADC	HDL	14:02:06	Hotel Delta Lima... ah... downwind runway one four.	
HDL	ADC	:17	Hotel... Delta Lima stand by short.	
HDL	ADC	:44	Delta Lima report position in the pattern.	
ADC	HDL	:47	Hotel Delta Lima end of runway ah... one four.	
ADC	HDL	14:03:03	Hotel Delta Lima confirm we're cleared for approach?	
HDL	ADC	:10	Delta Lima is now in sight on a rather narrow downwind, continue towards ah... Bern city to stay clear of inbound axis one four, traffic is five miles out.	
ADC	HDL	:21	Hotel Delta Lima stay... taking straight ahead and stay clear of the inbound traffic, Hotel Delta Lima.	
NAV4	ADC	:30	Navchecker four one one look out for traffic close to the runway axis on a left hand downwind extending to join behind you.	
ADC	NAV4	:39	Roger copied, looking out.	
ADC	HHV	:52	...three thousand feet for landing via rate... right hand downwind ah... one eight Hotel... one four, Hotel Hotel Victor.	2 stations overlapping
HDL	ADC	14:04:02	Two stations Hotel ah... Delta Lima roger.	
HHV	ADC	:12	Hotel Hotel Victor roger, report on downwind abeam Tower, on right hand downwind abeam Tower.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	HHV	14:04:20	Repeat Hotel Hotel Viktor?	
HHV	ADC	:22	Hotel Hotel Victor, report abeam Tower on right hand downwind.	
ADC	HHV	:28	Will report abeam Tower, Hotel Hotel Victor.	
NAV4	ADC	:32	Navchecker four one one, wind one five zero degrees, two knots, cleared for low go around.	
ADC	NAV4	:38	Cleared low go around, Navcheck four one one.	
ADC	HDL	:44	Hotel Delta Lima may we turn in?	
HDL	ADC	:47	Hotel Delta Lima affirm, number two, number one xxxxx	unintelligible
ADC	H-DL	:53	Number two, Hotel Delta Lima.	
HHV	ADC	14:06:02	Hotel Hotel Victor number two, number one single engine on ah... long final for runway one four, turn base behind.	
ADC	HHV	:10	I'm number two, Hotel Hotel Victor, will ca... watch for the traffic in long final.	
HHV	ADC	:25	Hotel Hotel Victor, advised traffic is about two miles final.	
ADC	HHV	:31	Will watch for the traffic in final Hotel Hotel Victor, actual position abeam Tower, in middle down wind, two thousand eight hundred feet.	
HHV/HDL	ADC	:39	Roger, break break, Hotel Delta Lima, wind one zero zero degrees, two knots, runway one four cleared to land.	
ADC	HDL	:46	Runway one four, cleared to land, Hotel Delta Lima.	
NAV4	ADC	14:07:05	Navchecker four one one report your program?	
ADC	NAV4	:08	Yeah, another procedure ah Bravo, after that procedure X-Ray, followed by Echo and than Foxtrot.	
NAV4	ADC	:20	Roger, extend the downwind to join behind the Falcon fifty which is about ah... one two miles out on a left hand base at ah... five thousand feet, I call you back for the inbound turn.	
ADC	NAV4	:34	Roger copied.	
ADC	HHV	:35	Hotel Hotel Victor turning base, one eight... one four.	



# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
HHV	ADC	14:07:39	Hotel Hotel Victor roger.	
ADC	HEZ	:43	Tower Hotel Bravo Echo Zulu, information November, ready for taxi, outbound ah... Zulu, for a short local flight.	
HDL	ADC	:51	Hotel Delta Lima vacate next to the left.	
ADC	HDL	:55	Vacate next to the left, Hotel Delta Lima.	
HEZ	ADC	:57	Hotel Bravo Hotel Echo Zulu Bern Tower, hold position, call you back.	
ADC	HEZ	14:08:01	Roger.	
ADC	HHV	:10	Hotel Hotel Victor turning final one four.	
HHV	ADC	:13	Hotel Hotel Victor, Wind one one zero degrees, two knots, runway one four cleared to land.	
ADC	HHV	:18	Cleared to land, Hotel Hotel Victor.	
ADC	HDL	:22	Runway one four vacated, Hotel Delta Lima.	
HDL	ADC	:26	Hotel Delta Lima, stand by for the marshaler track.	
ADC	HDL	:30	Standing by, Hotel Delta Lima.	
NAV4	ADC	14:09:02	Navchecker four one one, you're now coming abeam the traffic ah.. which is xxxxx.	unintelligible
ADC	NAV4	:08	Yeah traffic is in sight.	
HHV	ADC	:18	Hotel Hotel Victor, taxi ahead and vacate via Delta.	
ADC	HHV	:23	Vacated via Delta, Hotel Hotel Victor.	
ADC	NAV4	:30	Tower Navchecker four one one, may we turn inbound?	
NAV4	ADC	:37	Navcheck four one one report speed?	
ADC	NAV4	:41	Ah... one fifty indicated.	
NAV4	ADC	:46	Navcheck four one one stand by for inbound turn.	
ADC	NAV4	:49	Standing by.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	SUI	14:09:52	Tower hello, Swiss Airforce zero zero three, ah... established at four thousand.	
SUI	ADC	:58	Swiss Airforce zero zero three Bern Tower, wind two zero degrees, two knots, runway one four cleared to land.	
ADC	SUI	14:10:05	Cleared to land one four, Swiss Airforce zero zero three.	
NAV4	ADC	:09	Navcheck four one one inbound turn approved.	
ADC	NAV4	:11	Turning inbound, Navcheck four one one.	
ADC	HHV	:17	Hotel Hotel Victor runway vacated.	
HHV	ADC	:19	Hotel Hotel Victor stand by for the marshaler.	
ADC	HHV	:22	Stand by, Hotel Hotel Victor.	
ADC	RUAG	:40	Bern Tower from RUAG Maintenance?	
RUAG	ADC	:44	RUAG Maintenance Bern Tower.	
ADC	RUAG	:47	Request towing an aircraft ah.. via taxi way Kilo from RUAG Maintenance hangar to the outer "Bundesbasisplatz".	
RUAG	ADC	:59	Ah... RUAG Maintenance Bern Tower, hold position call you back in approximately two minutes.	
ADC	RUAG	14:11:05	RUAG Maintenance hold position.	
HEZ	ADC	:11	Hotel Bravo Hotel Echo Zulu taxi to holding point runway one four intersection Alpha, QNH one zero one seven.	
ADC	HEZ	:16	Alpha, Hotel Echo Zulu.	
ADC	HHF	:29	Hotel Bravo Kilo Hotel Foxtrot, ready to taxi.	
HHF	ADC	:38	Hotel Bravo Kilo Hotel Foxtrot... stand by short.	
HHF	ADC	14:12:02	Hotel Hotel Foxtrot hold position, call you back shortly.	
ADC	HHF	:06	Holding position, Hotel Hotel Foxtrot .	
ADC	SUI	:23	Swiss Airforce zero zero three at short final, confirm cleared to land?	
SUI	ADC	:26	Affirm, cleared to land, wind variable, two knots.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	SUI	14:12:28	Thanks.	
SUI	ADC	14:13:11	Swiss Airforce zero zero three vacated vie Foxtrot.	
ADC	SUI	:14	Vacating via Fox, Swiss Airforce zero zero three.	
ADC	HHF	:20	Hotel Fox ready.	
HHF	ADC	:24	Hotel Fox taxi to runway one four, intersection Bravo.	
ADC	HHF	:28	Taxi runway one four intersection Bravo, Hotel Hotel Foxtrot.	
ADC	HEZ	:32	Tower Echo Zulu, we're ready with departure outbound Zulu.	
HEZ	ADC	:40	Hotel Echo Zulu hold position.	
ADC	HEZ	:42	Holding Echo Zulu.	
ADC	HPT	:46	Bern Tower Hotel Bravo Papa Papa Tango, green three, request taxi for outbound Echo – Hasle with information November.	
HPT	ADC	:59	Hotel Papa Tango, hold position call you back.	
ADC	HPT	14:14:02	Hold position, Hotel Papa Tango.	
ADC	NAV3	:29	Tower Navchecker three one one?	
NAV3	ADC	:32	Navcheck three one one Bern Tower, go ahead.	
ADC	NAV3	:34	Ja, may we break off here, ah... left break off... for another approach?	
NAV3	ADC	:41	Navcheck four one one affirm, break off is approved, and confirm then again Bravo?	
ADC	NAV3	:46	That's affirmative.	
NAV3	ADC	:47	Roger.	
HEZ	ADC	:54	Hotel Echo Zulu wind variable, two knots, runway one four cleared for take off outbound Zulu.	
ADC	HEZ	14:15:02	Echo Zulu is cleared to go xxxxx.	unintelligible

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
HPT	ADC	14:15:09	Hotel Papa Tango, taxi to holding point runway one four intersection Alfa.	
ADC	HPT	:14	Taxi to holding point one four intersection Alfa, Hotel Papa Tango.	
ADC	HPV	:45	Bern Tower Hotel Bravo Papa Papa Viktor "grüezi", VFR from Grenchen, Kirchberg four thousand five hundred feet, for landing via route November, information is November, QNH one zero one seven.	
HPV	ADC	14:16:00	Hotel Bravo Papa Papa Viktor Bern Tower, proceed via Hasle and enter via Echo due traffic, for left hand downwind runway one four, QNH one zero one seven.	
ADC	HPV	:12	Inbound via Echo to Bern and ah... Hotel Papa Viktor?	
HPV	ADC	:17	Affirm Hotel Papa Viktor, due traffic proceed to Hasle and enter via Echo for left hand downwind runway one four.	
ADC	HPV	:24	Roger, say again the point before Echo please?	
HPV	ADC	:28	To Hasle!	
ADC	HPV	:30	Roger, proceeding to Hasle and then Echo, Hotel Papa Viktor.	
HPV	ADC	:34	Call in for left hand downwind runway one four, QNH one zero one seven.	
ADC	HPV	:38	Enter downwind one four, QNH one zero one seven, Hotel Papa Viktor.	
ADC	RUAG	14:17:09	Bern Tower from RUAG Maintenance?	
RUAG	ADC	:14	RUAG Maintenance Bern Tower, taxi via Kilo is now approved to outer "Bundestarmac".	
ADC	RUAG	:19	Taxi is approved via Kilo, xxxxx.	unintelligible
ADC	HHF	:40	Hotel Hotel Foxtrot, ready for departure, request back track.	
HHF	ADC	:51	Hotel Hotel Foxtrot back track runway one four.	
ADC	HHF	:54	Back track runway one four, Hotel Hotel Foxtrot.	
ADC	NAV4	14:18:17	Navchecker four on is turning inbound.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
NAV4	ADC	14:18:23	Navchecker four one one inbound turn approved.	
ADC	NAV4	:26	Roger copied.	
HHF	ADC	14:19:24	Hotel Hotel Foxtrot, VFR traffic about ten miles north-east of the field inbound to... join left downwind runway one four, single engine, keep an eye.	
ADC	H-HF	:34	Will do, Hotel Hotel Foxtrot.	
HHF	ADC	:36	Hotel Hotel Foxtrot, wind variable two knots, runway one four cleared for take off.	
ADC	HHF	:42	Cleared for take off runway one four, Hotel Hotel Foxtrot.	
HPV	ADC	:51	Hotel Papa Victor look out for... a... single engine traffic departing runway one four, north-east bound, climbing through your level.	
ADC	HPV	14:20:02	Looking out for a single engine and ah.. now Hasle four thousand five hundred feet, next Echo, Hotel Papa Viktor.	
HPV	ADC	:10	Roger.	
ADC	HPT	:54	Hotel Papa Tango intersection Alfa, ready for departure.	
HPT	ADC	:59	Hotel Tango stand by.	
ADC	HEZ	14:21:13	Hotel Echo Zulu xxxxx four thousand xxxxx Fribourg xxxxx.	unintelligible
HEZ	ADC	:31	Hotel Echo Zulu may leave, good bye.	
ADC	HEZ	:33	Good bye.	
NAV4	ADC	14:22:08	Navchecker four one one cleared for the low go around runway one four ... wind calm, traffic is a Cirrus on your left cross wind departure, north-east bound, about ah... two miles north-east of the field, additionally one Piper, six miles north-east of the field, four thousand feet inbound.	
ADC	NAV4	:37	Roger, confirmed cleared low approach, for Navcheck four one one?	
NAV4	ADC	:40	Four one one I confirm, cleared for low approach.	
ADC	NAV4	:43	Roger, and then afterwards ah... procedure X-Ray.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
NAV4	ADC	14:22:50	X-Ray approved, four thousand three hundred feet.	
ADC	NAV4	:55	Yeah confirmed.	
H-PV	ADC	14:23:20	Hotel Papa Viktor keep an eye for a... twin engine, in a go around runway one four, in a left turn direction north.	
ADC	H-PV	:27	Looking out for the twin engine, Hotel Papa Viktor, thank you.	
NAV4	ADC	:32	Navchecker four one one to confirm, we have a Cirrus on ah... two miles east of Bern beacon, three thousand feet, north-east bound, and ah... opposite traffic four miles north-east of the field, four thousand feet for left down wind for runway one four, Piper.	
ADC	NAV4	:48	Yeah roger copied, looking out.	
ADC	HPV	:51	Hotel Papa Viktor, Echo, three thousand eight hundred feet, descending for the left hand downwind one four.	
HPV	ADC	:57	Hotel Papa Victor report on downwind and the advised Cirrus is ah.. at your twelve o'clock, range half a mile, three thousand three hundred feet in climb.	
ADC	HPV	14:24:07	Yeah, twin is now in sight and number one for runway one four, Hotel Papa Victor.	
ADC	HHF	:33	Hotel Fox?	
HHF	ADC	:38	Go ahead.	
ADC	HHF	:39	Ah... we have to return to the field for landing, we... have an open door.	
HHF	ADC	:44	Hotel Hotel Foxtrot roger, join left hand downwind runway one four and ah... report visually.	
ADC	HHF	:50	Left hand downwind one four, call you.	
ADC	HHF	:51	"xxxxx bi uns düre welä und zwar gseh düre Druck isch grad d'Tür uf".	
ADC	HPV	:59	"Ja Hotel Papa Victor, Ich has au gseh, ja".	
ADC	HEZ	14:25:20	Tower Hotel Bravo Echo Zulu, information Oscar, xxxxx landing via Sierra.	unintelligible

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
HEZ	ADC	14:25:28	Hotel Echo Zulu via Sierra, join right hand down wind one four, QNH one zero one seven.	
ADC	HEZ	:32	Roger via Sierra, xxxxx right hand down wind one four, Echo Zulu.	unintelligible
ADC	NAV4	:37	Tower Navchecker four one one?	
NAV4	ADC	:39	Go ahead.	
ADC	NAV4	:40	May we turn left to join the arc?	
NAV4	ADC	:43	Affirm, join the arc.	
ADC	NAV4	:45	Wilco.	
ADC	HPV	:46	Hotel Papa Victor, now left hand downwind runway one four for full stop.	
HPV	ADC	:53	Hotel... Papa... Victor... roger... number one, make short approach, wind calm, cleared to land.	
ADC	HPV	14:26:01	Number one, short approach one four, Hotel Papa Victor.	
HHF	ADC	:07	Hotel Hotel Foxtrot make altitude behind the Piper on a ah... end of left downwind one four.	
ADC	HHF	:13	Have the aircraft in side, number two behind, Hotel Hotel Foxtrot.	
ADC	HEZ	14:27:23	Hotel Echo Zulu is Sierra, next xxxxx.	unintelligible
HEZ	ADC	:29	Hotel Echo Zulu roger.	
HPV	ADC	14:28:14	Hotel Papa Victor, vacate next to the left via taxiway Delta, expedite when clear of runway, hold position, stand by for marshaler.	
ADC	HPV	:22	Next to the left, expediting to vacate, stand by for the marshaler, Hotel Papa Victor.	
HHF	ADC	:28	Hotel Hotel Foxtrot, wind one niner zero degrees, two knots, runway one four clear to land.	
ADC	HHF	:33	Clear to land ah... Hotel Hotel Foxtrot.	
HPT	ADC	:47	Hotel Papa Tango behind traffic at threshold one four line up and wait behind.	

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	HPT	14:28:52	Line up and wait behind, Hotel papa Tango.	
ADC	HHF	14:29:06	And Hotel Hotel Fox, request taxi to holding point one four again.	
HHF	ADC	:09	Hotel Hotel Fox affirm, via Bravo Charlie to Alpha again.	
ADC	HHF	:14	Ah... via Charlie to Alpha again, Hotel Foxtrot.	
HHF	ADC	:17	Okay, the clearance is still valid.	
ADC	HHF	:19	Okay.	
ADC	HHF	:20	"Also mir hei ihn ufem TCAS gseh, es isch sehr nach gsi, der isch genau uf üs los, mir hei müese "avoiding action" mache, und irgendwie düre Druck isch den Türe uf, es isch unerklärlich"!	
ADC	HEZ	:42	Hotel Echo Zulu right hand down wind one four.	
HEZ	ADC	:47	Hotel Echo Zulu roger, number one, report final.	
ADC	HEZ	:51	Report final, concrete or grass?	
HEZ	ADC	:53	Concrete.	
ADC	HEZ	:54	Concrete!	
HPT	ADC	:56	Hotel Papa Tango leave CTR via Echo, wind... calm, runway one four cleared for take off.	
ADC	HPT	14:30:01	Cleared for take off, leave via Echo – Hasle, Hotel Papa Tango.	
ADC	NAV4	:06	And Navcheck four one one has this arc complete, request right turn to join procedure Echo.	
NAV4	ADC	:18	Navchecker four one one proceed to Echo approved, four thousand eight hundred feet.	
ADC	NAV4	:22	Thank you, Navcheck four one one.	
ADC	HEZ	14:31:22	Hotel Echo Zulu is turning final one four, request exit Delta for Airmatec.	
HEZ	ADC	:29	Hotel Echo Zulu wind calm, runway one four cleared to land to vacate via Delta to Airmatec.	



# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	HEZ	14:31:35	Roger, cleared to land and cleared to go.	
ADC	HHF	14:32:20	Hotel Hotel Foxtrot, ready for backtrack runway one four.	
HHF	ADC	:25	Hotel Hotel Foxtrot, backtrack runway one four.	
ADC	HHF	:28	Backtrack runway one four, Hotel Hotel Foxtrot.	
ADC	HPT	14:33:10	Hotel Papa Tango, Echo three thousand five hundred feet, climbing direction Hasle.	
HPT	ADC	:16	Hotel Papa Tango roger, report leaving CTR.	
ADC	HPT	:19	Will report le... will report leaving CTR, Hotel Papa Tango.	
ADC	NAV4	:50	And Tower Navchecker four one one now on a right turn onto the arc.	
NAV4	ADC	:54	Navchecker four one one roger, are you in contact with Payerne?	
ADC	NAV4	:59	Negative.	
NAV4	ADC	14:34:01	Roger, so if you approaching TMA Payerne, just to contact Payerne Tower in case you penetrate this airspace.	
ADC	NAV4	:11	"Ja", think we are free of ah... their control zone.	
ADC	HHF	:24	Hotel Hotel Foxtrot ready.	
HHF	ADC	:26	Hotel Hotel Foxtrot, wind variable three knots, runway one four, cleared for take off.	
ADC	HHF	:30	Cleared for take off runway one four, Hotel Hotel Foxtrot.	
ADC	HPT	14:35:22	Hotel Papa Tango, I've leaved your CTR.	
xxx	xxx	:27	.....	some noise
ADC	HPT	:34	Bern Tower Hotel Bravo Papa Papa Tango, I have leaved you CTR.	
HPT	ADC	:39	Papa Tango I say again, you may leave.	strong background noise
HPT	ADC	:45	Papa Tango do you read?	strong background noise

# TRANSCRIPT SHEET

Occurrence: HBKHF / HBPPV of 24.06.2008



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>
ADC	HPT	14:35:48	I can hear you, Hotel Papa Tango.	
HPT	ADC	:51	You're cleared to leave, good bye.	strong background noise
ADC	HPT	:56	Cleared to leave, good bye, Hotel Papa Tango.	
ADC	HPQ	14:36:42	Bern Tower Hotel Bravo X-Ray Papa Quebec, Schwarzenburg four thousand feet, inbound via Hotel-Whiskey, for landing Heliswiss with information Oscar.	
HPQ	ADC	:52	Bravo X-Ray Papa Quebec Bern Tower, enter CTR via Hotel-Whiskey, QNH one zero one seven.	
ADC	HPQ	:58	QNH one zero one seven, enter CTR via Hotel-Whiskey, Heli Papa Quebec.	
ADC	918	14:37:32	Bern "guete Namittag" niner one eight, approaching xxxxx four thousand five hundred, crossing direction Worb.	unintelligible
918	ADC	:40	Niner one eight Bern "grüezi", ... squawk ident, passing approved, QNH one zero one seven.	
ADC	918	:47	Squawk ident, passing approved, one zero one seven, niner one eight.	
918	ADC	14:38:14	Niner one eight, identified.	
ADC	918	:16	"Merci villmal".	
HPQ	ADC	:43	Heli Papa Quebec report position and altitude?	
ADC	HPQ	:49	We're on emergency training, Heli Papa Quebec and ah... we're approaching soon Hotel-Whiskey.	
H-PQ	ADC	:54	Okay... confirm ah... below three thousand four hundred feet?	
ADC	HPQ	:59	Affirm Heli Papa Quebec.	
HPQ	ADC	14:39:01	Okay.	
NAV4	ADC	:19	Navchecker four one one, VFR traffic, twelve o'clock position, range two miles, three thousand six hundred feet in climb, west bound.	
ADC	NAV4	:26	"Ja" roger, looking out.	

## TRANSCRIPT SHEET

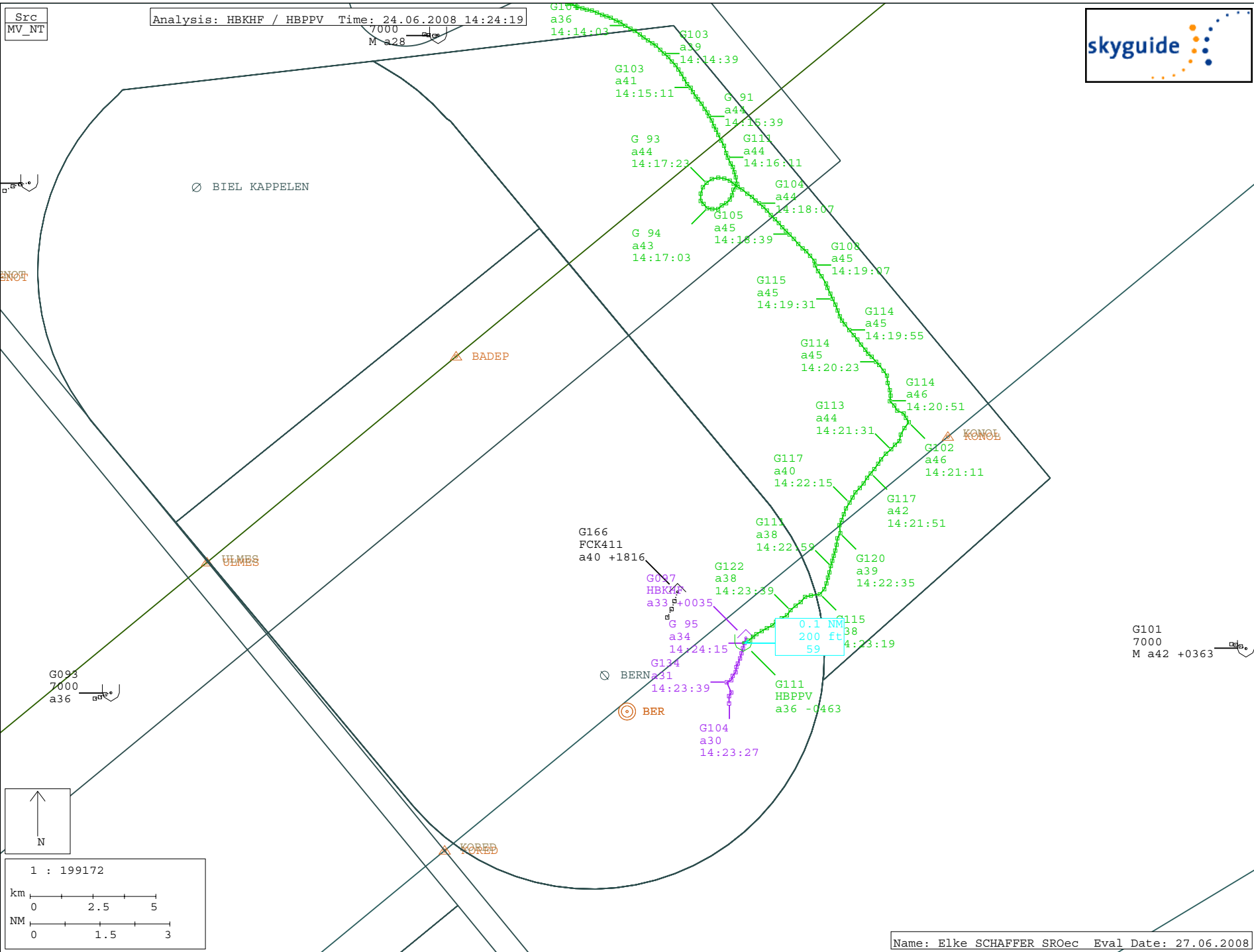
Occurrence: HBKHF / HBPPV of 24.06.2008



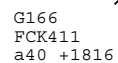
To <u>Col.1</u>	From <u>Col.2</u>	Time <u>Col.3</u>	Communications <u>Col.4</u>	Observations <u>Col.5</u>
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ADC	NAV4	14:39:46	Navchecker have the traffic in sight.	
NAV4	ADC	:48	Roger.	
HHF	ADC	14:40:31	Hotel Hotel Foxtrot, contact Bern Departure one two seven decimal three two five, good bye.	
ADC	HHF	14:40:36	One two seven decimal three two five, Hotel Hotel Foxtrot.	

**- End of Transcript -**



Analysis: HBKHF / HBPPV Time: 24.06.2008 14:24:19
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 BER