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Aircraft accident investigation bureau

Final Report No. 1889 of the Aircraft Accident Investigation Bureau

concerning the incident (Airprox)

between LX-DSL and F-BPKS

on 23 July 2004

On final on ILS runway 05, Geneva

FINAL REPORT

AIR TRAFFIC INCIDENT REPORT (ATIR)

AIRPROX (NEAR MISS)

This report has been prepared solely for the purpose of accident/incident prevention. The legal assessment of accident/incident causes and circumstances is no concern of the incident investigation (Art. 24 of the Air Navigation Law). The masculine form is used in this report regardless of gender for reasons of data protection.

PLACE/DATE/TIME On final on ILS runway 05, Geneva,
23 July 2004, 12:50 UTC

AIRCRAFT LX-DSL, LearJet 45, EuroJet Italia
Treviso (I) LIPH – Geneva (LSGG)

F-BPKS, Robin DR221, private VFR flight
Annecy (LFLP) – Dijon Darois (LFGI)

ATC UNIT Terminal Control, Intermediate Approach INT

CONTROLLER Arrival PRE

Coordinator APC

AIRSPACE C

HISTORY

On Friday 23 July 2004, at about 12:40, aircraft registration F-BPKS, a single-engined aircraft type Robin DR221, a private flight according to visual flight rules (VFR), took off from Annecy aerodrome (LFLP), destination Dijon Darois (LFGI). The weather conditions were visual meteorological conditions (VMC).

After take-off, the pilot adopted a north-north-easterly heading and climbed to an altitude of 5300 ft. He contacted Chambéry approach when he was 1.5 NM north of Annecy and reported that he was flying destination Reims at an altitude of 5000 ft. Chambéry Approach assigned him transponder code 7761, asking him for his transit route. The pilot informed control that he would be flying via Lons-le-Saunier and control instructed him to fly below altitude 5500 ft to avoid the Geneva TMA.

The pilot of aircraft F-BPKS did not enter the code assigned by Chambéry but code A7061 without selecting mode C. There was therefore no indication of altitude. Only code 7061 appeared on the Geneva Approach control radar screens.

The aircraft was flying in the class E controlled airspace of the Geneva TMA 2, about 10 NM east of the parallel route he should normally have followed to remain inside this airspace and avoid the class C controlled airspace of the Geneva TMA 1.

A LearJet 45, registration LX-DSL, a commercial flight from Treviso (I) to Geneva, was under radar vectoring for runway 05. At 12:46, Geneva Approach Control gave him unknown traffic information.

Geneva Approach's unknown traffic was aircraft F-BPKS. It would cross perpendicularly the route of the LearJet which was right downwind for runway 05 at flight level 098 descending. At this moment, aircraft F-BPKS was in the Geneva TMA 2, inside class E airspace. The pilot of aircraft LX-DSL reported to control that he could see it on the TCAS.

At 12:48, Chambéry Approach asked the pilot of aircraft F-BPKS to confirm his altitude. The pilot reported to him twice over an altitude of 5300 ft. Chambéry Approach assigned the pilot transponder code 7000, informed him that he was inside the Geneva TMA and authorised him to leave his frequency.

Aircraft F-BPKS entered the class C controlled airspace of Geneva TMA 1 without clearance. He was in the region of the Vuache and flying towards the region of Bellegarde. This route would bring him to cross the ILS approach line of Geneva runway 05 perpendicularly, about 12 NM from the threshold of the runway. There was still 4 NM to travel to the point of intersection.

At this time the LearJet 45 LX-DSL was turning right to intercept the ILS final approach line. He still had approximately 8 NM to travel to the crossing point with the route of aircraft F-BPKS.

At 12:49, when the LearJet was in the process of intersecting the ILS final approach line 15 NM from the threshold of runway 05, the Approach controller informed him of the unknown traffic, without indication of altitude, at his one o'clock, distance 3 NM, from right to left.

The pilot of the LearJet reported that he was established on the ILS line and that he was leaving altitude 6000 ft.

He then reported that he had visual contact with the traffic. He informed the controller that the unknown aircraft had passed the glide path altitude (descent alignment line on the ILS) and that he had had to maintain his altitude of 6000 ft to avoid it.

The incident took place at a distance of 12 NM from the threshold of runway 05, on the ILS approach line. The minimum distance between the aircraft was a lateral separation of 0.4 NM according to the radar recordings and an altitude difference of 500 ft, according to the LearJet pilot's estimate. The pilot of aircraft F-BPKS at no time made contact with a Geneva ATC unit. Nor was he invited to do so by the Chambéry ATC unit, but he was informed that he was in the Geneva TMA.

At 12:52, shortly after the incident, the coordinator of Geneva Approach telephoned Chambéry Approach to ask if he knew of the VFR unknown traffic which was displaying transponder code A7000 at ten nautical miles in the north of waypoint COLLO. He informed him that it had triggered a TCAS alert (traffic advisory) on an aircraft established on the Geneva ILS. Chambéry replied that he knew of this traffic, insisting that he was maintaining an altitude of 4300 ft and gave the registration of the aircraft: F-BPKS.

The crew of the LearJet LX-DSL submitted an ATIR report.

The ATC unit submitted an ATIR / AIRPROX report.

FINDINGS

- The runway in operation in Geneva was runway 05.
- Each of the two Geneva APP radar controllers was in possession of an appropriate licence.
- The aircraft type Robin DR221, registration F-BPKS, had taken off from Annecy (F), destination Dijon-Darois, and was flying according to visual flight rules (VFR) under visual meteorological conditions (VMC).
- The pilot of aircraft F-BPKS, according to his statements, had the necessary aeronautical charts available to make the flight.
- At 12:42:22, the pilot of aircraft F-BPKS called on the 123.7 MHz Chambéry Approach frequency. He reported his position as about 1.5 NM north-east of Annecy aerodrome at 5000 ft/QNH, heading 350 degrees, within the Chambéry TMA 2, in class E airspace.
- Chambéry Approach assigned him transponder code 7761, instructing the pilot to fly below an altitude of 5500 ft if he intended to cross the Geneva TMA. The pilot of aircraft F-BPKS selected and displayed transponder code A7061, without reporting his altitude and without Chambéry Approach correcting this error.
- At 12:41:13, the pilot of aircraft LX-DSL, a LearJet 45, on a commercial flight from Treviso (I) to Geneva, arriving at GOLEB waypoint (WPT), called Geneva "ARRIVAL" control on frequency 136.25 MHz.
- The radar controller cleared him to descend to flight level FL 140 and turn left onto heading 270 degrees for radar positioning for runway 05.
- At 12:43:28, according to the radar recordings, aircraft F-BPKS entered the class E airspace of the Geneva TMA 2; according to the pilot's statements, at an altitude of 5300 ft.
- At 12:46:16, the radar controller gave the pilot of aircraft LX-DSL traffic information: "...unknown traffic just appeared at your twelve o'clock, two miles, type and altitude unknown, most probably at low altitude." The pilot replied: "we have on TCAS".

All times indicated in this report follow the UTC format (local time -2)

- At 12:47:40, according to the radar recordings, aircraft F-BPKS entered the class C airspace of the Geneva TMA 1, displaying transponder code A7061, without any indication of altitude. According to the pilot's statements, his altitude was 5300 ft. The aircraft was on a heading of approximately 300 degrees. This heading caused it to cross the ILS approach line at about 12 NM from the threshold of the runway.
- At 12:48:02, Chambéry Approach asked the pilot of aircraft F-BPKS to report his altitude. The pilot reported 5300 ft, twice. Chambéry Approach assigned him transponder code 7000 before instructing the pilot to leave the frequency. It informed him that he was inside the Geneva TMA.
- At 12:48:52, the radar controller cleared the pilot of aircraft LX-DSL to descend to altitude 6000 ft and turn right onto heading 020 degrees to intercept the ILS approach line for runway 05. He cleared him for an ILS approach on runway 05.
- At 12:49:49, the radar controller issued essential traffic information to the pilot of aircraft LX-DSL: "... unknown traffic, one o'clock, three miles, type and altitude unknown, crossing the localizer from right to left".
- The pilot of aircraft LX-DSL asked if the altitude of this traffic was known, to which the radar controller replied in the negative, saying that he was not receiving transponder mode Charlie.
- The pilot of aircraft LX-DSL informed the radar controller that he was established on the ILS line and that he was leaving 6000 ft to descend.
- The pilot of aircraft LX-DSL immediately added that he had visual contact with the traffic and that this aircraft was crossing the ILS line at the glide path altitude. He informed the radar controller that he had had to maintain an altitude of 6000 ft and that he had had a TCAS alert (traffic advisory). He had estimated the altitude of the aircraft at 5500 ft.
- The radar controller informed the pilot of aircraft LX-DSL that he was submitting an incident report.
- The pilot of aircraft LX-DSL stated in his incident report that when he had received the radar controller's traffic information he had stopped the descent at 6000 ft and had in fact detected the traffic some 500 ft below.
- According to the radar recordings, the minimum distance between the two aircraft was a lateral separation of 0.4 NM and, according to the statements of the pilot of aircraft LX-DSL, an altitude difference of 500 ft.
- The unknown aircraft was identified following a telephone call between Geneva Approach and Chambéry Approach. At 12:52:09, the coordinator called Chambéry Approach to ask him if he knew of unknown VFR traffic displaying transponder code A7000 ten nautical miles north of point COLLO. He informed him that it had triggered a TCAS alert (traffic advisory) on an aircraft established on the Geneva ILS. Chambéry replied that he knew of this traffic which was maintaining an altitude of 4300 ft and gave the registration of the aircraft: F-BPKS.
- (ref. ATM-GE/APP Chap. 9 and Letter of Agreement LoA between Chambéry APP and Geneva TCG dated 18 March 2004)

Extracts:

"When the volume of traffic allows, Chambéry carries out telephone coordination with Geneva Approach before a known VFR enters the Geneva TMA class C sectors classified as category C airspace, i.e. above 5500ft ft QNH."

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"If coordination is not possible, the aircraft is sent to Geneva Information (126.350 MHz) in time for it to request clearance to enter class C airspace."

Flights known to Chambéry at 5500 ft and lower are not subject to any coordination. They are invited to contact Geneva Information (Service Order O.S. G-25 2003)

Chambéry Approach assigns a transponder code to VFR traffic flying in the Chambéry – Geneva direction from the range 7760 – 7765, assigned to VFR in transit.

- Weather: Information TANGO
QAM LSGG 1250Z 23.07.2004
250 DEG 6 KT. VRB BTN 210 AND 280 DEG
VIS 10 KM
FEW 6000 FT. SCT 9000 FT. BKN 22000 FT
+26/+18
QNH 1023 TWO THREE
QFE THR 05 972
QFE THR 23 973
NOSIG

ANALYSIS

Given the configuration of the relief and of the profile of the TMA, for VFR aircraft in transit in Geneva's TMA 2 in the Chambéry – Geneva direction, it is indispensable that ad hoc coordinations between Chambéry Approach and Geneva's ATC services take place, even for traffic flying within class E controlled airspace.

The majority of the VFR traffic in transit flies towards the north and flies over the Jura. Pilots therefore tend to climb because of the relief. The itinerary to the west of the Rhone, which makes it possible to fly inside class E airspace up to 5500 ft, seems to dissuade them, because of the detour involved. The VFR TRANSIT WEST route which was shown on chart OACI 1:500 000 until the implementation of the new TMA airspaces for the protection of the approach sector has unfortunately been removed. However, it did have the advantage of clearly indicating the itinerary to be followed to avoid the approach line of runway 05.

Serious incidents between aircraft flying according to instrument flight rules (IFR) and aircraft flying according to visual flight rules (VFR) occur often in the same region of the runway 05 approach sector at Geneva. They are due essentially to incursions by VFR aircraft into controlled airspace. Appropriate coordinations between the ATC services of Chambéry and Geneva would contribute to solving this problem.

It is noted that VFR pilots regularly display a transponder code, which means that the aircraft are visible on the radar screens. In addition, pilots frequently establish radiotelephone contact on an ATC frequency, and often sufficiently early for the ATC unit involved to be able to take the necessary measures to ensure safety of the traffic.

In the absence of coordination and before the communication transfer, Chambéry Approach should in no case change the assigned transponder code, as this code is the only means of information and identification.

Geneva Approach Control (TCG)

As soon as the PRE radar controller observed the display of the transponder code of the unknown conflicting aircraft, he reacted by twice giving traffic information to the pilot of aircraft LX-DSL, in different flight phases.

The first traffic information was issued at the time of the first crossing between aircraft LX-DSL and F-BPKS, when the latter was in Geneva TMA 2 class E airspace. Aircraft F-BPKS was displaying code A7061 without mode C, and the pilot of LX-DSL reported that he had it on the TCAS.

The second traffic information was issued just before the conflicting crossing, when aircraft F-BPKS was in Geneva TMA 1 class C airspace. The pilot of aircraft LX-DSL received a TCAS traffic advisory before establishing visual contact with the conflicting traffic.

A potential threat of an aircraft which is not displaying mode C is displayed on the onboard collision avoidance system by a bearing for the intruder which is accurate to within 10 degrees, without indication of altitude; establishing visual contact with this traffic is therefore complicated by the lack of knowledge of the vertical direction in which it is necessary to search.

Aircraft F-BPKS

The pilot, who was flying according to visual flight rules, was solely responsible for his navigation. According to his statements, he had available all the documentation necessary to navigate in the region in which he was flying.

The pilot stated in his report that he was flying at altitude 4500 ft inside the Geneva TMA 2, avoiding the summits, and that he did not make contact with Geneva, given that he was flying at an altitude of less than 5500 ft. However, he added that it is possible that he entered the Geneva TMA 1 while flying in the valleys.

The route actually flown by the pilot followed the Vuache massif (3612 ft) and then passed over the Jura relief between Bellegarde and the Grand Crêt d'Eau (5318 ft). This region is inside the Geneva TMA 1, in class C airspace, from 3500 ft up to flight level FL195.

Location errors in visual navigation and an incorrect interpretation of the information on the aeronautical chart used are probably the cause of this violation.

CAUSE

The incident is due to the intrusion of aircraft F-BPKS into the class C controlled airspace of the Geneva TMA 1 following navigation errors on the part of its pilot.

Factor affecting the development of the incident:

The absence of an exchange of information about an essential traffic between Chambéry Approach and Geneva Approach.

Berne, 23 March 2006

Aircraft Accident Investigation Bureau

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All times indicated in this report follow the UTC format (local time -2)

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

Investigation into the **incident** that occurred on **23.07.2004**

- Subject of transcript: **LXDSL / FBPKS**

- Centre concerned: Swiss Radar Area West

- Designation of unit: Terminal Control Geneva, sector Arrival

- Frequency / Channel: 136.25 MHz

- Date and period (UTC) covered by attached extract: 23.07.2004
12:41 - 12:51 UTC

- Date of transcript: 05 August 2004

- Name of official in charge of transcription: Ivan ROCHAT

- 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.

Geneva, 05 August 2004



Ivan ROCHAT

Abbreviations

Sector Designation of sector

PRE - Swiss Radar Area West, Terminal Control Geneva, sector Arrival
 APC - Geneva Approach
 CBY - Chambéry Tower

<u>Aircraft</u>	-	<u>Callsign</u>	<u>Type of acft</u>	<u>Flight rules</u>	<u>ADEP</u>	-	<u>ADES</u>
LSL	-	LXDSL	LJ45	IFR	LIPH	-	LSGG
HKZ	-	HBIKZ	GLEX	IFR	LFGJ	-	LSGG
41WB	-	SWR41WB	A321	IFR	LSZH	-	LSGG

OG EY / 05 August 2004

TRANSCRIPT SHEET

Occurrence: LXDSL / FBPKS of 23.07.2004



To	From	Time	Communications	Observations
<u>Col.1</u>	<u>Col.2</u>	<u>Col.3</u>	<u>Col.4</u>	<u>Col.5</u>

Frequency: 136.25 MHz, sector Arrival

PRE	LSL	12:41:13	Heu... Geneva Arrival..., good afternoon, Lima X-ray Delta Sierra Lima, descend one six zero.	
LSL	PRE	21	Lima X-ray Delta Sierra Lima, bonjour, descend to flight level one four zero, left heading two seven zero, vectoring runway zero five.	
PRE	LSL	28	Descend one four zero, left two seven zero, vector for ILS zero five, Lima Sierra Lima.	
HKZ	PRE	12:42:12	Hotel Kilo Zulu, réduisez la vitesse à maximum cent quatre-vingts nœuds afin de permettre un départ, et la Tour, cent dix-huit sept, au revoir.	
PRE	HKZ	18	On réduit à cent quatre-vingts nœuds et cent dix-huit sept, merci, au revoir.	
41WB	PRE	20	Swiss four one Whiskey Bravo, descend to seven thousand feet, QNH one zero two three.	
PRE	41WB	26	Descending seven thousand feet, QNH one zero two three, Swiss four one Whiskey Bravo.	
LSL	PRE	37	Lima Sierra Lima, descend to flight level one one zero.	
PRE	LSL	40	Descend flight level one one zero, Lima Sierra Lima.	
PRE	LSL	12:45:03	Roger, one one zero, Lima Sierra Lima.	
LSL	PRE	05	Lima Sierra Lima, descend to flight level niner zero.	
PRE	LSL	09	Descend niner zero, Lima Sierra Lima.	
LSL	PRE	12:46:01	Geneva, Lima Sierra Lima, turn left heading two four zero for downwind.	
PRE	LSL	06	Left, two four zero, Lima Sierra XXXXX.	Probably " Lima "
LSL	PRE	16	And Lima Sierra Lima, unknown traffic just appeared at your twelve o'clock, two miles, type and altitude unknown, most probably at low altitude.	
PRE	LSL	26	We have on TCAS..., Lima Sierra Lima.	
PRE	41WB	29	And Swiss... four Whiskey Bravo, is ready for visual.	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurrence: LXDSL / FBPKS of 23.07.2004



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>
41WB	PRE	12:46:32	Swiss four one Whiskey Bravo, roger, descend six thousand feet, expect so.	
PRE	41WB	37	Descending six thousand feet, Swiss four one Whiskey Bravo.	
LSL	PRE	57	Lima Sierra Lima, descend to seven thousand feet, QNH one zero two three.	
PRE	LSL	12:47:02	Descend seven thousand, one zero two three, Lima Sierra Lima.	
41WB	PRE	11	Swiss four one Whiskey Bravo, cleared for visual approach runway zero five, be established latest on final overhead Passeiry VOR.	
PRE	41WB	20	Cleared visual and we ????? to be established latest ... Passeiry VOR, Swiss... four one Whiskey Bravo.	Unreadable
41WB	PRE	25	Roger, for information, there is an unknown traffic at your one o'clock, five mil, five miles, type and altitude unknown, heading south..., heading northbound.	
PRE	41WB	36	On TCAS, but not yet in sight, Swiss four one Whiskey Bravo.	
41WB	PRE	38	Roger.	
LSL	PRE	12:48:02	Lima Sierra Lima, turn right heading three two zero for base.	
PRE	LSL	06	Right, three two zero, base, Lima Sierra Lima.	
LSL	PRE	52	Lima Sierra Lima, descend to six thousand feet, turn right heading zero two zero, cleared ILS approach runway zero five.	
PRE	LSL	59	Down, six thousand, right zero two zero, clear ILS approach zero five, Lima Sierra Lima.	
41WB	PRE	12:49:04	Swiss four one Whiskey Bravo, contact Tower on one one eight seven, au revoir.	
PRE	41WB	08	Eighteen seven, bye, XXXXX four one Whiskey Bravo.	Probably " Swiss "
LSL	PRE	49	Lima Sierra Lima, unknown traffic, one o'clock, three miles, type and altitude unknown, crossing the localizer from right to left.	

Signature of person in charge of transcription :

TRANSCRIPT SHEET

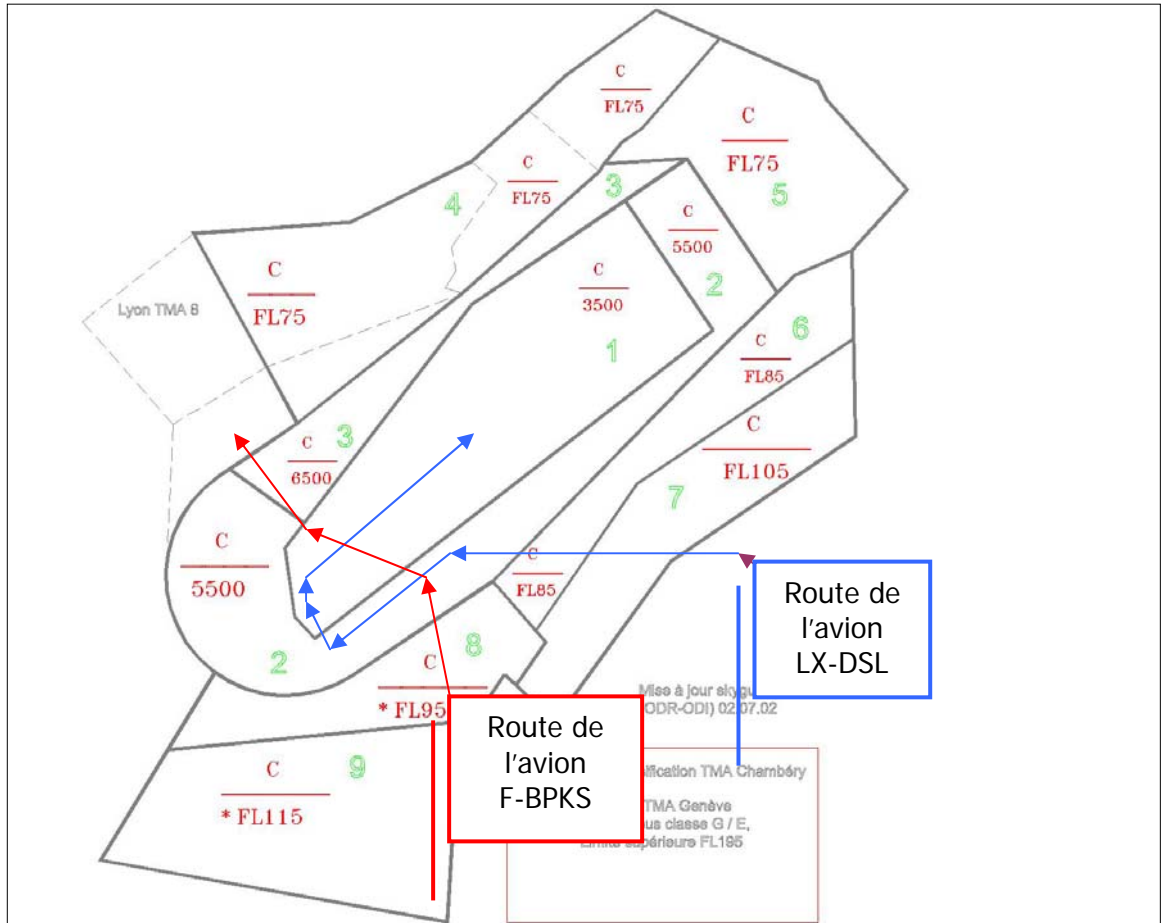
Occurrence: LXDSL / FBPKS of 23.07.2004



To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
PRE	LSL	12:49:59	And you don't know the altitude of this Piper ?	
LSL	PRE	12:50:02	No, it seems to be a VFR at low altitude but there is no mode Charlie readout.	
PRE	LSL	09	Roger, Lima Sierra Lima, now we are established on the localizer, leaving six thousand feet for information to the Piper.	
LSL	PRE	16	XXXXX, we don't know this traffic and he is not in contact with us.	Could be " Roger "
PRE	LSL	44	Okay, traffic in sight, but for information XXXXX was... the altitude of the ILS ??????	Could be " it " Unreadable
LSL	PRE	52	Say again, please.	
PRE	LSL	54	I want to inform you that the Piper was passing through the altitude of the ILS zero five, we had to maintain six thousand feet for a while, this is not good.	
LSL	PRE	12:51:04	Lima Sierra Lima, thank you, in this case I will fill, file a report against this traffic.	
PRE	LSL	10	And we had also a traffic... advisory, so it's not nice for us.	
LSL	PRE	15	????? understand..., do you have an estimated altitude of this traffic ?	Unreadable
PRE	LSL	21	Heu...approximately five thousand five hundred feet... I suppose.	
LSL	PRE	24	Thank you very much, contact now Tower on one one eight decimal seven, goodbye.	
PRE	LSL	28	One one eight seven, Lima Sierra Lima, bye.	

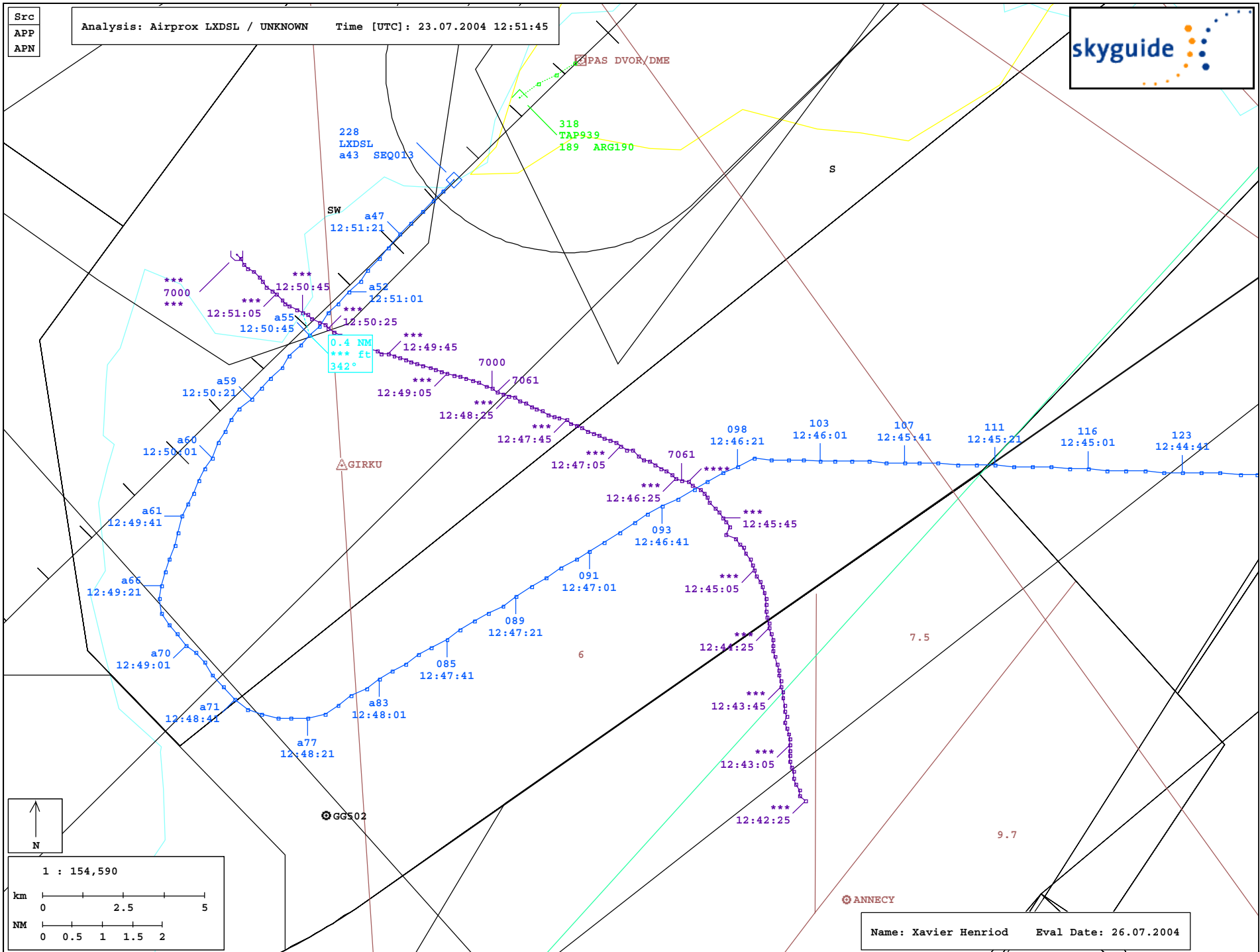
Signature of person
in charge of transcription :

Airprox LX-DSL / F-BPKS 23.07.2004
Détail des espaces aériens des TMA de Chambéry et de Genève



Src
APP
APN

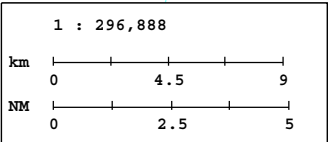
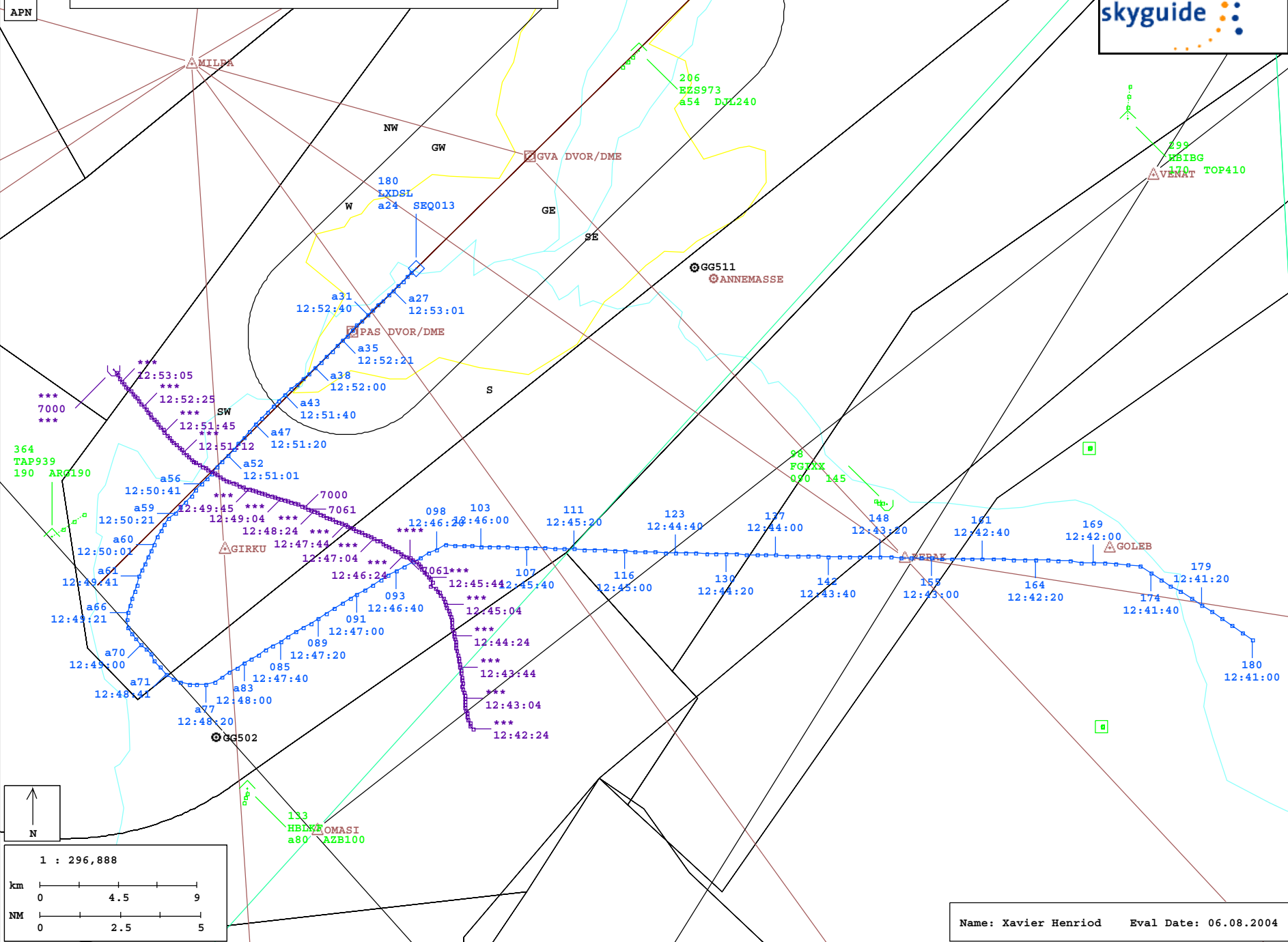
Analysis: Airprox LXDSL / UNKNOWN Time [UTC]: 23.07.2004 12:51:45



Name: Xavier Henriod Eval Date: 26.07.2004

Src
APP
APN

Analysis: Airprox LXDSL / FBPKS Time [UTC]: 23.07.2004 12:53:24



Name: Xavier Henriad Eval Date: 06.08.2004