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Final Report No. 1914 of the Aircraft Accident Investigation Bureau

concerning the incident (Airprox)

between AZA8TB and HB-GJN

on 28 May 2004

TOSMI, 88 NM south-east of Geneva

HISTORY

On the afternoon of Friday 28 May 2004, a Beechcraft B350 registration HB-GJN was making a private flight from Granges to St Tropez La Môle. It was maintaining flight level FL 250 and was on route MOLUS – MEDAM – VEVAR. The pilot made radio contact with Geneva sector MS/L2 at 16:40:26.

During this time, an A321 on scheduled flight AZA 8TB from Lisbon to Milan Malpensa was approaching the Geneva control region. Its pilot in turn called sector MS/L2 at 16:50:44 and reported that the aircraft was descending to flight level FL 270 as it approached point BLONA. The radar controller identified him and replied that he would call back to continue the descent. At 16:51:53, at the moment when flight AZA 8TB entered Geneva controlled airspace, the radar controller cleared it to descend to flight level FL 240, imposing a rate of descent of at least 2000 feet per minute. The pilot of flight AZA 8TB read back this clearance.

HB-GJN was then at a distance of 14 NM from AZA 8TB, on a converging route. At 16:52:52 the radar controller cleared flight AZA 8TB to flight level 230 and imposed a new rate of descent of at least 3000 ft/min. At 16:53:08, the radar controller transmitted traffic information to the pilot of aircraft HB-GJN (*"traffic at your 2 o'clock, 4 miles, crossing your flight level"*). The pilot of HB-GJN replied that he had the traffic in sight.

At about 16:53:10, the onboard Traffic Collision Avoidance System (TCAS) of AZA 8TB issued a "climb" resolution advisory; the aircraft was then at a distance of approximately 5 NM from the B350 and was passing flight level FL 256 in descent. The pilot of AZA 8TB informed ATC that he was climbing to flight level FL 260. Three seconds later, the Short Term Conflict Alert (STCA) was activated on the radar controller's screen. According to the recording of the radar tracks, the closest point of approach for the two aircraft occurred at 16:53:25, with a lateral separation of 3.1 NM and an altitude difference of 400 ft. At 16:53:49, AZA 8TB was maintaining flight level FL 260 and crossed the trajectory of HB-GJN, behind the latter; separation between the two aircraft was re-established.

HB-GJN was not equipped with a TCAS; its pilot maintained his assigned flight level throughout the conflict.

The pilot of flight AZA 8TB stated that he would submit a report on the resolution advisory; the radar controller informed him that he would do the same.

FINDINGS

- The incident took place at point TOSMI, 88 NM south-east of Geneva, in class A French airspace, in the area of jurisdiction of the Geneva Area Control Centre (ACC).
- Flight conditions were VMC (visual meteorological conditions).
- The two controllers were in possession of appropriate licences.
- On the day of the incident, the radar controller started work at 11:50. He occupied the sector MS/L2 working position from 16:20 to 17:00.
- On the day of the incident, the radar coordinator started work at 13:00. He occupied the sector MS/L2 working position from 16:00 to 17:30.
- AZA 8TB was equipped with a TCAS.
- HB-GJN was not equipped with a TCAS. At the time of the incident, the regulations did not require such equipment to be installed in this type of aircraft.

All times in this report follow the coordinated universal time (UTC) format (local time –2)

- The regulations in force since 1 January 2005 require any civil turbine fixed wing aircraft with a maximum take-off mass greater than 5700 kg or an approved number of passenger seats greater than 19 to be equipped with a TCAS II, Version 7.
- At the time of the incident, sectors MS (frequency 126.05) and L2 (frequency 134.85) were coupled. (MS/L2).
- The workload was judged to be high by the radar controller and average by the radar coordinator.
- At the time of the incident, the two aircraft AZA 8TB and HB-GJN were in radio contact with Geneva ACC sector MS/L2.
- Radiotelephone communications took place using English phraseology.
- The route of aircraft HB-GJN was MOLUS – MEDAM – VEVAR.
- The route of AZA 8TB was south of BALSJ – BLONA – TOP.
- The stated capacity of sector MS/L2 was 38 movements per hour. Geneva ACC had announced regulation over this sector between 16:20 and 20:20.
- According to the flow management logbook for the day of the incident, the ACC supervisor had decided to increase the capacity of sector MS/L2 to 40 movements per hour for the entire period of regulation, with a view to avoiding traffic congestion in the sector after the end of regulation.
- According to data from the ACC flow management unit, 35 flights entered sector MS/L2 between 15:00 and 16:00, 37 between 16:00 and 17:00 and finally 42 between 17:00 and 18:00. Between 16:40 and 17:00, 17 aircraft were on the two coupled frequencies of sector MS/L2. There were 112 exchanges of communication between 16:40 and 16:55:58.
- At 16:40:26, the pilot of aircraft HB-GJN called sector MS/L2, reporting his flight level FL 250 and his route towards MEDAM.
- At 16:50:44, the pilot of flight AZA 8TB called sector MS/L2 and reported that he was descending towards flight level FL 270 and approaching point BLONA; the radar controller cleared him to fly via points BLONA and Turin and added that he would call him back to continue the descent.
- Before flight AZA 8TB made radio contact with Geneva, the radar coordinator, at 16:50:04, initiated telephone coordination with sector INI South in order to obtain a lower flight level for this aircraft. INI South agreed flight level FL 240 and, as a function of a crossing with an aircraft in its own sector, flight level 230, agreed with Milan control.
- As soon as AZA 8TB arrived in the zone controlled by Geneva, the sector MS/L2 radar controller cleared it to continue its descent to flight level FL 240, at a minimum rate of descent of 2000 feet per minute. The pilot of flight AZA 8TB read back this clearance.
- At 16:52:52, i.e. one minute after the first clearance to descend, the sector MS/L2 radar controller instructed the pilot of AZA 8TB to continue his descent to flight level FL 230 at a rate of at least 3000 ft/min.
- The pilot of flight AZA 8TB read back the cleared flight level but did not repeat the new rate of descent which had been imposed.
- At 16:53:08, the sector MS/L2 radar controller issued essential traffic information to the pilot of HB-GJN: *"Hotel Juliet November, traffic at your two o'clock, four miles, descending through your level"*. The latter replied that he had the traffic in sight.
- At 16:53:10, the TCAS of AZA 8TB issued a "climb" resolution advisory.

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- At 16:53:13, the STCA alarm was activated when the lateral separation between the two aircraft was 4.8 NM and the altitude difference was 500 ft.
- At 16:53:20, the pilot of AZA 8TB informed control that he was climbing to flight level FL 260 following a resolution advisory on his TCAS; the controller replied that he was to maintain flight level FL 260: *"Alitalia eight Tango Bravo, roger, maintain flight level two six zero, I call you for lower"*.
- At 16:53.25, according to the recording of the radar tracks, the two aircraft had a lateral separation of 3.1 NM and an altitude difference of 400 ft.
- At 16:53:34, the INS radar controller issued traffic information to the pilot of aircraft AZA 8TB: *"Alitalia eight Tango Bravo, your traffic is now at your twelve o'clock position, maintaining flight level two five zero"*.
- At 16:53:49, according to the recording of the radar tracks, AZA 8TB was maintaining flight level FL 260 and crossed the trajectory of HB-GJN, 1 NM to the north of the latter.
- At 16:54:32, the radar controller instructed the pilot of AZA 8TB to contact Milan control centre on frequency 125.27 MHz.
- At 16:54:56 the pilot of flight AZA 8TB called on the sector MS/L2 frequency and stated that he was going to submit a report on the resolution advisory; the radar controller replied that he was also going to submit one.
- Weather: QAO-A1 : 15Z-21Z FL240: 350° 55 KTS

ANALYSIS

Air traffic control aspects

Sector MS/L2

On the day of the incident, between 16:20 and 20:20, sector MS/L2 was subject to "regulation", i.e. an attempt was made to distribute the number of aircraft into blocks of 20 minutes, to avoid an excessive workload at any particular time. The capacity of this sector, notified to the Central Flow Management Unit (CFMU) in Brussels, was 38 aircraft per hour.

At 14:05, the supervisor decided to increase capacity to 40 movements per hour throughout the period of regulation, in order to avoid congestion in the sector after the regulation period. The workload in the sector concerned was sustained on that Friday afternoon.

The incident occurred in the time slot during which the volume of traffic was at its peak in the hour in question. During the following hour, the sector's capacity was clearly exceeded, with a total of 42 movements; it was to be feared that the aircraft in the next time slot would enter the sector a little ahead of time.

It is surprising that the two sectors MS and L2 were coupled and that an increase in capacity was decided upon on a day of heavy traffic (Busy Friday) before 19:00 local time.

The controllers

The radar controller

On the day of the incident, the radar controller started work at 11:50. He had occupied the MS/L2 position for some thirty minutes when the incident took place. According to his statements, he had to handle a high level of complex traffic. The control frequency was much in demand. A high workload may reduce a controller's ability to prevent or correct any errors.

At the time of the first call to sector MS/L2 from AZA 8TB, the aircraft was still in airspace controlled by Marseilles. The controller informed the pilot that he could expect to continue his descent shortly. When flight AZA 8TB crossed the line of jurisdiction between Marseilles and Geneva, it was cleared to descend to flight level FL 240 at a rate of descent of at least 2000 ft/min. The recording of the radar tracks shows that AZA 8TB was then passing flight level FL 275 in descent, 15 NM from aircraft HB-GJN and that their trajectories would cross in 1 minute 43 seconds. One minute later, the controller cleared AZA 8TB to flight level FL 230, with an instruction to descend at a rate of at least 3000 ft/min. AZA 8TB was passing flight level FL 264 in descent; its distance from aircraft HB-GJN was less than 8 NM and they would cross 57 seconds later. At this moment, the controller also issued traffic information to the pilot of HB-GJN. When the pilot of AZA 8TB informed the controller that he was climbing to flight level FL 260 following a TCAS resolution advisory, he was instructed in return to maintain this flight level and traffic information was issued to him.

Given the high workload prevailing at the time of the incident, it is probable that with a view to efficiency the controller sought to resolve the problem generated by this potentially conflicting crossing as quickly as possible. Under time pressure, he did not therefore consider any possibilities other than that of allowing the aircraft involved to continue on their assigned routes, thinking that he would be able to ensure vertical separation between them by accelerating the descent of AZA 8TB. In view of the speed at which the two aircraft were converging and the rates of descent imposed in AZA 8TB, it is apparent that the loss of separation was inevitable.

The radar coordinator

On the day of the incident, the radar coordinator came on duty at 13:00. He occupied the MS/L2 position for an hour before the incident and remained there for thirty minutes afterwards. According to his statements, he considered his workload to be average.

Before AZA 8TB had contacted sector MS/L2, the coordinator had already carried out a coordination with the sector below, INI South, with a view to obtaining a lower flight level for this aircraft. He obtained flight level FL 230 and noted it on the control slip. This early coordination allowed his radar controller colleague to clear AZA 8TB to continue its descent expeditiously.

According to his statements, he did not hear the radar controller's clearance because he was carrying out a coordination by telephone. When he became aware of the "re-clearance" to flight level FL 230, he made a comment to his colleague, informing him that he considered that the chosen solution was inadequate.

Following the climb by flight AZA 8TB to flight level FL 260 and the fact that this aircraft was close to the boundary between Geneva and Milan control centres, the radar coordinator carried out a telephone coordination with the Milan controller, asking if he could accept flight AZA 8TB at flight level FL 260. The latter replied in the affirmative.

Flight management aspects

The issue here is to analyse the contribution that the control of AZA 8TB played in the unfolding of the airprox incident; the examination will centre on the implementation of the ATC instructions and the response to the TCAS alerts. The behaviour of this aircraft's crew alone is considered, as the second aircraft involved was not equipped with an onboard collision avoidance system and maintained its assigned flight level (FL 250) throughout the conflict.

Visualisation of the incident

The specific features of the conflict are highlighted on a graphical representation, as a function of time and of the lateral and vertical separations which were established between the two aircraft (see annex 1). It has been produced on the basis of the radar track recording and on it are entered the 2000 and 3000 ft/min slopes requested by the controller, the original trajectory¹ of AZA 8TB and the significant resolution advisories issued, extracted from an InCAS simulation performed by skyguide.

The vertical speeds have been shown assuming that flight AZA 8TB would be in a stable descent 10 seconds after the last readback corresponding to the instruction; the value attributed to this delay takes into account the lesser inertia on increasing slopes for an aircraft which is already in the descent phase. The trajectory "without TCAS" is constructed by extrapolating the trajectory which was established prior to the reaction to the instructions of the onboard collision avoidance system.

The resolution advisories shown are simulated from the same source as the one used to produce the graphical representation, i.e. the recording of the radar tracks; by way of verification, it was checked that the corrective climb advisory did in fact take place 35 seconds before the closest point of approach. These reproduced advisories are reliable, even if their sequence may differ by a few seconds from reality, because the operations of the onboard collision avoidance systems' algorithms follow a cycle which repeats at the nominal rate of once per second, whereas the radar data has a refresh rate of 12 seconds. Finally, the accuracy of the flight levels shown on the figure is the same as that on the radar track recordings, i.e. rounded off to the nearest hundred feet. The altitude difference between two aircraft can therefore be determined to within ± 100 feet.

Results

Taking into account the details given above, there was a loss of separation (simultaneously less than 1000 feet altitude difference and less than 5 NM lateral separation) for 30 seconds (from 16:53:12 to 16:53:42). For the first 13 seconds of this event, the two aircraft were converging up to the closest point of approach where the lateral separation was 3.1 NM and the altitude difference was 400 feet.

If AZA 8TB had continued on its original trajectory, the conflict would have lasted 13 seconds longer (43 seconds) and the trajectories would have converged for 16 seconds, reaching 2.8 NM and 0 feet.

Analysis of the results

Implementation of ATC instructions

The readback of the instruction to descend to flight level FL 240 at a rate of 2000 ft/min or more ended at 16:52:15 UTC and the aircraft was at FL 273. At 16:53:05, when the flight crew finished repeating the instruction to continue the descent to flight level FL 230, the aircraft was on a slope corresponding to the requested 2000 ft/min. The instruction to adopt a vertical speed of 3000 ft/min or more was not repeated by the pilots but the graphical representation shows that the slope corresponding to this instruction was followed up to the issuing of the "climb" corrective resolution advisory. This omission is certainly due to the fact

¹ *Original trajectory: the original trajectory of an ACAS aircraft is that which the aircraft in the same encounter would follow if it was not equipped with ACAS.*

that the traffic information was generated at the same time as the instruction from the controller (16:52:52) and that the pilots then gave priority to flying the aircraft (towards the requested flight level and at the requested rate of descent) and to the procedure to follow in the case of a TA (analysis of the possible threat, preparation for the issuing of an RA and establishing visual contact with the intruder outside the aircraft).

TCAS configuration

HB-GJN is the intruder, in level flight, for AZA 8TB, which is the ACAS aircraft in descent phase. In this conflict geometry, the TCAS is designed to prepare an avoiding manoeuvre in the direction which will guarantee vertical separation between the two aircraft by a target value (ALIM) at the closest point of approach. For the altitude block in which the aircraft were flying (20,000 – 42,000 ft, sensitivity level 7), ALIM is fixed at 600 feet. The chosen trajectory direction was “climb” and the resolution advisory issued was of the positive corrective type (advising the pilot to deviate from his current flight trajectory by climbing).

Behaviour of the crew of AZA 8TB in respect of the resolution advisories

The “CLIMB” corrective resolution advisory was generated (16:53:10) approximately 5 seconds after the flight crew of AZA 8TB responded to the instruction to increase their rate of descent to 3000 ft/min or more (*“Down to level two three zero, Alitalia... eight Tango Bravo.”*) The recording of the radar tracks shows that in the previous tracking interval (between 16:52:49 and 16:53:01), i.e. that in which the instruction to increase the vertical speed was given, the aircraft was already descending at an average rate of 2500 ft/min. The pilots therefore had to fly an avoiding manoeuvre in the direction contrary to that indicated in the air traffic controller’s instruction, complicated, moreover, by the considerable inertia when passing from an established descent of over 2500 ft/min to a climb demanded by the TCAS of 1500-2000 ft/min. In these particular circumstances, this transition was achieved in an appropriate manner even though vertical separation (400 ft ± 100) fell below the ALIM target value of 600 ft. Subsequently, levelling-off at FL 260 took place in accordance with the instructions contained in the second corrective resolution advisory, softened to a resolution advisory with a vertical speed limit.

The pilots of AZA 8TB immediately informed the air traffic controller of their change in trajectory inherent in the positive corrective resolution advisory.

Onboard collision avoidance equipment

In this conflict dynamic with high rates of convergence, the minimum vertical separation between the two aircraft would have been greater than 400 ft if HB-GJN had been equipped with an onboard collision avoidance system; the involvement of the TCAS would have been coordinated and the aircraft in level flight would have received a “descend” corrective resolution advisory, an action which would have reduced the risk of an accident. The risk of collision following a coordinated TCAS intervention is expressed in figures by the International Civil Aviation Organisation (ICAO): the anti-collision logic is such that the predicted number of collisions is reduced by a factor of 4.5 if the intruder, in this case HB-GJN, is equipped with ACAS and reacts to the alerts. Without a reaction, on the other hand, the risk is 1.8 times higher if the intruder is not equipped with an onboard collision avoidance system.

Conclusion

In terms of the flight management of AZA 8TB, the following three facts emerge from the analysis of the incident:

- the pilots correctly obeyed the ATC instructions relating to the requested rates of descent;

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- the original trajectory of AZA 8TB would have led to a loss of separation for 43 seconds, the limit values of which would have been 2.8 NM and 0 ft;
- the pilots obeyed the TCAS instruction in an appropriate manner.

Comments

In terms of flight management, this airprox incident raises the question of the requirement relating to equipping aircraft with onboard collision avoidance systems.

The pilots of AZA 8TB had to carry out an avoiding action by climbing, whilst their aircraft was descending at a considerable vertical speed, which the air traffic controller was instructing them at the same time to increase. The action was carried out correctly but the reversal of the vertical direction (descent/climb), delayed by the inertia of the aircraft, led to a vertical separation to the intruder which was less than the ALIM target value of 600 ft. If HB-GJN had been equipped with a TCAS, the coordination of the collision avoidance systems would have triggered a "descend" resolution advisory which would have been simple to implement, since the aircraft was in level flight.

Coordination of collision avoidance systems considerably reduces the risk of collision, provided that the flight crews react appropriately to resolution advisories. The obligation to fit an aircraft with a TCAS system should depend not on its maximum take-off mass, number of passenger seats or type of operation but on the airspace in which it flies. In other terms, the risk of convergence which occurred between AZA 8TB and HB-GJN does not depend on the type of these two aircraft but solely on the fact that they were involved in a conflicting traffic configuration, within a given airspace.

CAUSE

The incident is due to the fact that the radar controller selected and applied an inappropriate conflict resolution tactic.

The supervisor's decision to increase the capacity of two coupled sectors was inappropriate because of the excessive volume of traffic which prevailed during the time slot during which the incident took place.

Factor which played a part in the incident:

the fact that HB-GJN was not equipped with TCAS.

SAFETY RECOMMENDATIONS

Safety deficit

An Airbus A321 descending to FL 270 was flying on a route converging at 90° with that of a Beechcraft B250 which was stable at flight level FL 250. When the Airbus was approaching its cleared level, the controller on duty instructed it to continue its descent to FL 240 at a rate of 2000 ft/min or more; the two aircraft were then some fifteen nautical miles apart. A little more than one minute later, the Airbus was instructed to continue to flight level FL 230 at a currently imposed vertical speed greater than or equal to 3000 ft/min. These control instructions were not sufficient to correct an inappropriate separation tactic and the two aircraft converged excessively. The Airbus's onboard collision avoidance system (TCAS) then issued a "climb" corrective resolution advisory, which its pilots followed correctly. The Beech

B250 was not equipped with TCAS and maintained its assigned flight level (FL 250) throughout the conflict.

Despite the Airbus flight crew's appropriate reaction to the positive corrective resolution advisory, the aircraft involved in the airprox were temporarily at a vertical separation lower than the target value which applied in the conflict conditions. If both rather than one of the aircraft had been equipped with an onboard collision avoidance system, the involvement of the latter would have been coordinated and resolution advisories leading to complementary actions would have been issued in both cockpits. If the reactions to the alarms had been correct, the vertical separation between the two aircraft would have been greater.

The risk of collision does not depend on the type of aircraft involved, but solely on the fact that the latter are in a conflicting traffic configuration, within a given airspace. The obligation to fit an aircraft with a TCAS system should therefore depend not on its maximum take-off mass, number of passenger seats or type of operation but on the airspace in which it is flying.

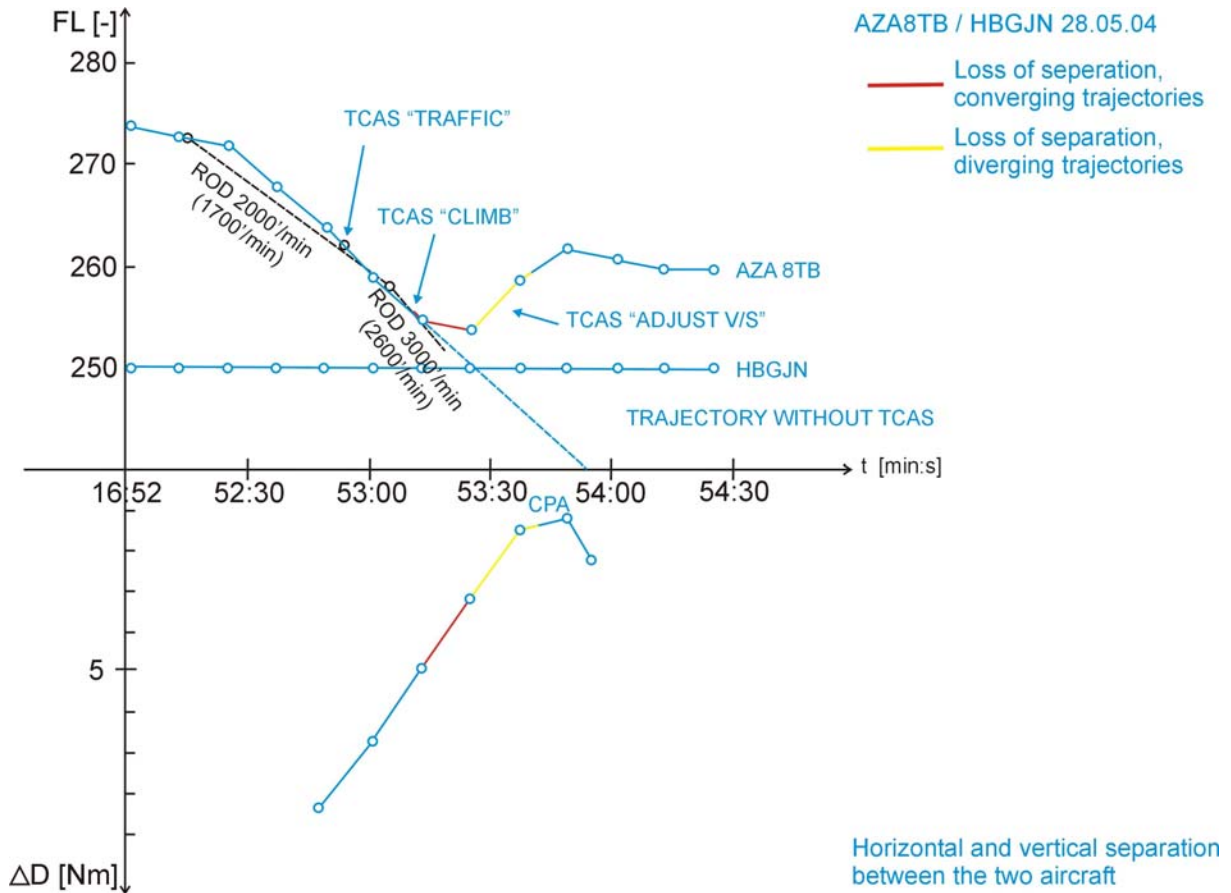
Safety recommendation No. 378

The Federal Office for Civil Aviation should demand that all aircraft in controlled airspace be equipped with an onboard collision avoidance system (TCAS).

Berne, 11 September 2006

Aircraft Accident Investigation Bureau

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.



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

Investigation into the **incident** that occurred on **28.05.2004**

- Subject of transcript: **AZA8TB / HB-GJN**

- Centre concerned: Swiss Radar Area West

- Designation of unit: Terminal & Upper Control, coupled sectors
MOLUS / L2

- Frequency / Channel: 134.852 MHz / 126.05 MHz

- Date and period (UTC) covered by attached extract: 28.05.2004
16:40 - 16:55 UTC

- Date of transcript: 17 June 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, 17 June 2004



Ivan ROCHAT

Abbreviations

Sector Designation of sector

MS - Swiss Radar Area West, Terminal & Upper control, coupled sectors MOLUS / L2

<u>Aircraft</u>	-	<u>Callsign</u>	<u>Type of acft</u>	<u>Flight rules</u>	<u>ADEP</u>	-	<u>ADES</u>
HJN	-	HB-GJN	B350	IFR	LSZG	-	LFTZ
2085	-	Swiss 2085	A320	IFR	LPPT	-	LSZH
146	-	British 146	RJ1H	IFR	EGCC	-	LIRF
1561	-	Air France 1561	E145	IFR	LIPX	-	LFPG
572	-	Nouvelair 572	MD83	IFR	DTMB	-	EBBR
6T8	-	Alitalia 6T8	E145	IFR	LEBB	-	LIMC
30U	-	Alitalia 30U	MD82	IFR	LFPG	-	LIMC
I2176	-	I2176	C30J	IFR	EGXW	-	LIBA
976	-	Merair 976	MD82	IFR	LIRN	-	LFPG
2111	-	Swiss 2111	A320	IFR	LEMG	-	LSZH
FAV	-	F-ORAV	F2TH	IFR	LIRQ	-	LSGG
8TB	-	Alitalia 8TB	A321	IFR	LPPT	-	LIMC
1913	-	Air France 1913	A321	IFR	LIML	-	LFPG
DET	-	D-IJET	P180	IFR	LEPA	-	EDLN
2801	-	Aero Avcom 2801	H25B	IFR	EGGW	-	LIMC
342	-	Alitalia 342	A319	IFR	LIMC	-	LFPG
563	-	Regional 563	E135	IFR	LIPZ	-	LFLL

OGEY / 17 June 2004

TRANSCRIPT SHEET



Occurrence: AZA8TB / HB-GJN of 28.05.2004

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
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Coupled Frequencies: 134.85 MHz & 126.05 MHz, sectors MOLUS & L2

MS	HJN	16:40:26	Swiss Radar, Hotel Bravo Golf Juliett November, bonjour, flight level two five zero, on course to MEDAM.	
HJN	MS	31	Hotel Juliett November, bonsoir, identified.	
MS	HJN	34	Hotel Juliett November.	
2085	MS	41	Swiss two zero eight five, descend flight level two six zero.	
MS	2085	46	Descend level two six zero, Swiss two zero eight five.	
146	MS	16:41:07	British one four six, contact now Milan on one three three decimal seven four, goodbye.	
MS	146	12	One three three decimal seven four for Milano, British one four six, bye.	
146	MS	16	XXXXX.	Microphone noise
2085	MS	16:42:45	Swiss two zero eight five, descend to flight level two five zero.	Change of controller
MS	2085	48	Descend level two five zero, Swiss two zero eight five.	
2085	MS	51	That's correct and contact Radar on... one two eight decimal niner, au revoir.	
MS	2085	56	One two eight niner, Swiss two zero eight five.	
MS	1561	16:43:10	Swiss Radar, good evening, Air France one five six... one, flight level two eight... zero, heu... on course to... VADEM.	
1561	MS	19	Air France one five six one, bonsoir, squawk five seven two six, report requested level?	
MS	1561	28	Five seven two six... and... .. may we have... three zero zero?	
1561	MS	35	Call you back.	
MS	1561	47	And did you copy for Air France one five six one?	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004



To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
1561	MS	16:43:49	Affirm, Air France one five six one, maintain flight level two eight zero, I call you back.	
MS	1561	53	Roger, thank you, one five six one.	
572	MS	16:44:15	Nouvelair five seven two, contact Radar, channel one three two decimal three one five, au revoir.	
MS	572	20	Three two three one five, Five seven two, bye-bye.	
MS	6T8	32	Ginevra, bonjour, Alitalia six Tango eight, two seven zero level.	
6T8	MS	35	Alitalia six Ta..., Tango eight, bonjour, identified, direct to Torino, descend flight level two five zero.	
MS	6T8	42	Descending two five zero, direct to ... Torino, Alitalia six Tango eight.	
MS	30U	59	Radar, good morning, Alitalia... three zero Uniform, level to nine zero.	
30U	MS	16:45:03	Alitalia three zero Uniform, bonjour, identified, maintain flight level two niner zero.	
MS	30U	07	Two nine zero to maintain, Alitalia three zero Uniform.	
1561	MS	10	Air France one five six one, identified, cleared ROMTA - TINIL, climb flight level three zero zero.	
MS	1561	15	ROMTA - TINIL and climbing flight level three zero zero, Air France one five six one.	
6T8	MS	19	Alitalia six Tango eight, contact... Milano, one two five decimal two, correction, XXXXX one two five decimal two seven, au revoir.	Could be "affirm"
MS	6T8	27	Milano, one two five two seven, Ali six Tango eight, ciao.	
MS	I2176	16:46:35	Swiss Radar, India two one seven six with you..., flight level two five zero.	
I2176	MS	41	India two one seven six, bonjour, identified, maintain flight level two five zero.	
MS	I2176	47	India two one seven six will maintain two five zero.	
I2176	MS	52	India two one seven six, direct to Torino.	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004



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>
MS	I2176	16:46:55	India two one seven six, direct... Torino from present position.	
MS	976	16:47:50	Swiss, good afternoon, Merair niner seven six, flight level three two zero.	
976	MS	54	Merair nine seven six, bonjour, squawk five seven six three.	
MS	976	58	Five seven six three, Merair niner seven six.	
MS	2111	16:48:04	Swiss Radar, bonjour, Swiss two triple one, flight level three zero zero.	
2111	MS	09	Swiss two triple one, bonjour, identified, cleared LAMUR - BERSU, flight level three zero zero.	
MS	2111	14	LAMUR - BERSU, flight level three zero zero, Swiss two triple one.	
976	MS	35	Merair nine seven six, identified, cleared GALBI - TINIL, flight level three two zero.	
MS	976	41	GALBI - TINIL, Merair niner seven six.	
MS	FAV	53	Swiss Radar, bonjour, Foxtrot Oscar Romeo Alfa Victor, flight level two six zero, we are deviating left the track due weather.	
FAV	MS	16:49:01	Fox Oscar Romeo Alfa Victor, bonjour, squawk five seven four six and... report your heading.	
MS	FAV	07	Five seven four six is the squawk, heading at the present is three one zero, Fox Alfa Victor.	
FAV	MS	12	Roger, for how many miles do you estimate to continue on this heading?	
MS	FAV	15	Heu... probably another twenty, Sir and then... it looks like it's pretty much clear on track for the rest of the way, Fox Alfa Victor.	
FAV	MS	20	Roger.	
FAV	MS	16:50:19	Fox Alfa Victor, identified, when clear of weather, set course direct to GOLEB for GOLEB two November transition, maintain flight level two six zero.	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004



To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
MS	FAV	16:50:27	Roger, maintaining two six zero and... when clear of weather, direct to GOLEB..., Fox Oscar Romeo Alfa Victor.	
FAV	MS	35	That's correct for a GOLEB two November transition.	
MS	FAV	38	GOLEB two November transition..., Alfa Victor.	
MS	8TB	44	Heu..., Alitalia eight Tango Bravo, descending level two seven zero, approaching BLONA.	
8TB	MS	49	Alitalia eight Tango Bravo, bonjour, identified, cleared BLONA - Torino and I call you for lower.	
MS	8TB	54	BLONA - Torino, standing by for lower, Alitalia eight Tango Bravo.	
30U	MS	57	Alitalia three zero Uniform, descend flight level two five zero.	
MS	30U	16:51:01	Down level two five zero, Alitalia three zero Uniform.	
1913	MS	11	Air France one niner one three, Swiss Radar, are you on frequency?	No reply
MS	DET	19	Swiss Radar, hello, Delta India Juliett Echo Tango, level three two zero, inbound IRMAR.	
DET	MS	23	Delta India Juliett Echo Tango, bonjour, identified, cleared IRMAR - MOLUS - PENDU, flight level three two zero.	
MS	DET	29	Three two zero, IRMAR - MOLUS - PENDU, Delta India Juliett Echo Tango.	
MS	1913	34	Swiss, bonjour, Air France, Air France one nine one three, climbing level two six zero.	
1913	MS	39	Air France one nine one three, bonjour, squawk five seven seven zero, report requested level.	
MS	1913	44	Five seven seven zero is coming up and requesting level three four zero, Air France one nine one three.	
1913	MS	49	That's copied.	
MS	1913	50	XXXXX.	Microphone noise

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TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004



To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
8TB	MS	16:51:53	<i>Alitalia eight Tango Bravo, descend flight level two four zero, two thousand feet a minute or more.</i>	
MS	8TB	16:52:02	<i>Alitalia eight Tango Bravo..., approaching level two seven zero, say again?</i>	
8TB	MS	06	<i>Alitalia eight Tango Bravo, descend flight level two four zero, two thousand or more.</i>	
MS	8TB	10	<i>Down two four zero, two thousand or more, Alitalia eight Tango Bravo.</i>	
MS	2801	15	XXXXX Charlie two eight zero one, good afternoon..., descent flight level three three zero, direct to Tango Oscar Papa.	Probably "Radar, hello, Alfa Oscar"
2801	MS	24	Alfa Oscar Charlie two eight zero one, bonjour, identified, descend flight level two six zero.	
MS	2801	29	Continue down two six zero, Alfa Oscar Charlie.	
8TB	MS	52	<i>Alitalia eight Tango Bravo, descend to flight level two three zero with now three thousand feet a, a minute or more.</i>	
MS	8TB	59	<i>Down to level two three zero, Alitalia ... eight Tango Bravo.</i>	
HJN	MS	16:53:08	Hotel Juliett November, your traffic at your... three o'clock, correction, two o'clock position, four miles, descending through your level.	
MS	HJN	15	Hotel Juliett November, we have the traffic in sight, thank you.	
MS	8TB	20	<i>Eight Tango Bravo, resolution advisory, we are climbing now heu... two six zero.</i>	
8TB	MS	25	<i>Alitalia eight Tango Bravo, roger, maintain flight level two six zero, I call you for lower.</i>	
MS	8TB	30	<i>Okay, two six zero, standing by for lower, Alitalia eight Tango Bravo.</i>	
8TB	MS	34	<i>Alitalia eight Tango Bravo, your traffic... is at... now your twelve o'clock position, maintaining flight level two five zero.</i>	

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TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004



To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
MS	8TB	16:53:41	Okay, reaching two six zero, descending flight level two five zero, Alitalia eight Tango Bravo.	
8TB	MS	45	Alitalia eight Tango Bravo, negative, maintain flight level two six zero.	No reply
2111	MS	16:54:04	Swiss two triple one, descend to flight level two five zero.	
MS	2111	08	Descending level two five zero the Swiss two triple one.	
MS	8TB	11	Alitalia eight Tango Bravo, confirm we are cleared descend flight level two five zero?	
8TB	MS	15	Alitalia eight Tango Bravo, descend now flight level two five zero, heu... correction, Alitalia eight Tango Bravo, maintain flight level two six zero.	No reply
8TB	MS	25	Alitalia eight Tango Bravo, maintain flight level two six zero.	
MS	8TB	28	Eight Tango Bravo, maintaining flight level two six zero.	
8TB	MS	32	Alitalia eight Tango Bravo, contact Milano, one two five decimal two seven, au revoir.	
MS	8TB	37	Heu... say again the frequency, eight Tango Bravo.	
8TB	MS	40	Alitalia eight Tango Bravo, contact Milano, one two five decimal two seven.	
MS	8TB	45	Two five two seven, bye-bye.	
30U	MS	47	Alitalia three zero Uniform, contact Milano, one two five decimal two seven, au revoir.	
MS	30U	52	One two five two seven, au revoir, Alitalia three zero Uniform.	
MS	8TB	56	Swiss Radar, Alitalia eight Tango Bravo?	
8TB	MS	16:55:00	Hotel Juliett November calling?	
MS	8TB	02	Yes, it's Alitalia eight Tango Bravo, we will fill a report about this resolution advisory ??????	Unreadable
8TB	MS	09	Affirm, we will... as well... file a report.	

Signature of person in charge of transcription :

TRANSCRIPT SHEET

Occurrence: AZA8TB / HB-GJN of 28.05.2004

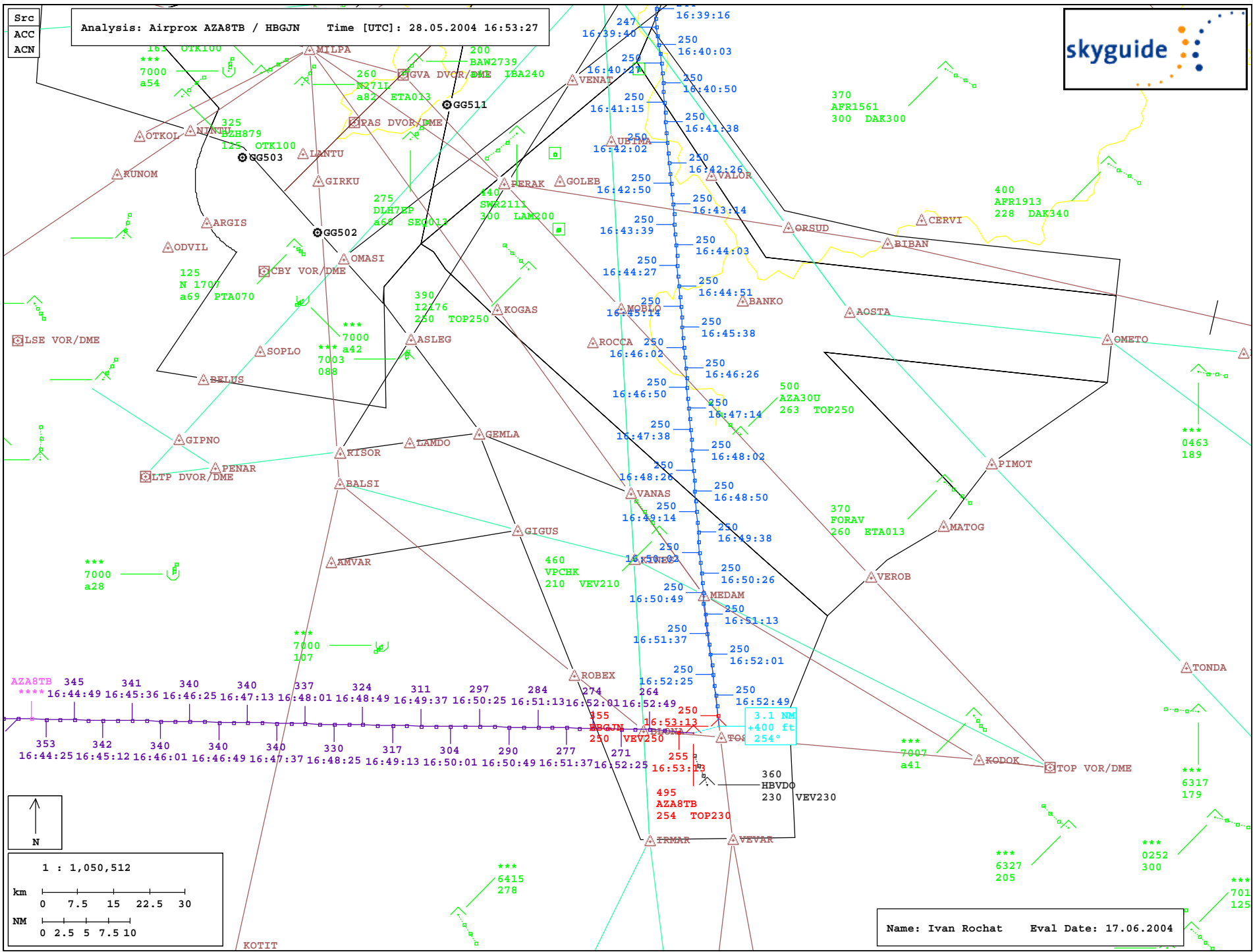


To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
MS	8TB	16:55:12	Thank you.	
8TB	MS	12	And I confirm, two five two seven for Milano.	No reply
MS	342	17	Buona Serra, Swiss Radar, Alitalia three four two, climbing level two four zero.	
342	MS	21	Alitalia three four two, bonjour, squawk five seven four two.	
MS	342	24	Five seven four two, ??????.	Unreadable
2111	MS	28	Swiss two triple one, contact Radar, one two eight decimal niner.	
MS	2111	31	Two eight niner, Swiss two triple one, au revoir.	
30U	MS	34	Alitalia three zero Uniform, contact Milano, one two five decimal two seven.	No reply
MS	563	41	Swiss, good evening, Regional five six three.	
563	MS	44	Regional five six three, bonjour, squawk five seven seven seven.	
MS	563	49	Squawking five seven seven seven, five six three.	
HJN	MS	52	Hotel Juliett November, Marseilles, one two five six five.	
MS	HJN	55	One two five six five, au revoir, Hotel Juliett November.	
8TB	MS	58	Alitalia eight Tango Bravo, are you still on frequency?	No reply

Signature of person
in charge of transcription :

Src
ACC
ACN

Analysis: Airprox AZA8TB / HBGJN Time [UTC]: 28.05.2004 16:53:27



Name: Ivan Rochat Eval Date: 17.06.2004

