**Federal Department of the Environment,
Transport, Energy and Communications** **N° 1868**

Final Report of the Aircraft Accident Investigation Bureau

concerning the incident (Airprox)

between EZS932 and SWR1344

on 30 August 2003

6 NM south-east of KLO VOR

Bundeshaus Nord, CH-3003 Berne

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	6 NM south-east of KLO VOR, 30.08.2003, 08:28 UTC
AIRCRAFT	EZS932, B733, HB-IIT, EasyJet Switzerland EGGW (London Luton) – LSZH (Zurich)
	SWR1344, E145, HB-JAG, Swiss Intl. Air Lines LSZH (Zurich) – EPWA (Warsaw)

ATC UNIT	Aerodrome Control
AIR TRAFFIC	Aerodrome Controller (ADC)
CONTROLLERS	Ground Controller/ Coordinator (GRO)
	Approach Controller East (APE)
	Daily Operations Manager (DOM)

AIRSPACE	C

HISTORY

On 30 August 2003 at 08:27 an Embraer 145 of the Swiss company, flight number SWR1344, was taking off from runway 16 in Zurich in accordance with the standard instrument departure (SID) assigned to it, DINAR 3U, on a scheduled flight to Warsaw.

At the same time the EasyJet Boeing 737, flight number EZS932, arriving from Luton, was on the landing approach to runway 14. In the short final, at an altitude of about 1800 ft/QNH (according to the radar recording), the commander (CMD) of EZS932 initiated a go-around, because he realised that it was no longer possible to execute a sufficiently long stabilised final approach. Initiation of the go-around was reported immediately by the co-pilot (first officer - F/O) to air traffic control (ATC).

The competent aerodrome controller (ADC ATCO) now realised that because of the constellation (SWR1344 was flying slightly to the south of EZS932) and the defined flight paths of the two aircraft, a separation infringement might occur. He therefore instructed the EasyJet aircraft to climb quickly to 5000 ft and issued the Swiss aircraft which had taken off with the instruction to continue climbing initially on the heading of the direction of runway 16, instead of initiating a left turn in accordance with the SID.

A little later he issued EZS932 with traffic information concerning SWR1344, which was flying a little ahead of it. The EasyJet crew responded to this information with the information that they had the other aircraft on their TCAS display.

Some 20 seconds later, the ADC ATCO instructed EZS932 to initiate a left turn onto heading 020°; this instruction was confirmed by the flight crew. At this time, the aircraft was on the point of passing 3000 ft/QNH in a climb.

Both the departing Swiss Embraer and the EasyJet Boeing performing a go-around encountered cloud above an altitude of approximately 2400 ft/QNH, without any possibility of establishing reciprocal visual contact.

A series of circumstances now caused the two aircraft subsequently to close laterally and vertically and the minimum separation values were infringed.

The flight crew of EZS932 did not complete the left turn in accordance with the instruction they had received; the ADC ATCO, for his part, interpreted the initiation of a left turn which was detectable on the radar display shortly after his instruction as a confirmation that EZS932 was in the process of complying with his instruction. This would prove a little later to be a mistake – EZS932 changed its heading only slightly to the east.
The ADC ATCO then allowed SWR1344 to turn left in the direction of DALIK, in order to bring it back onto its original departure route, and then handed over EZS932 to Approach Control East (APE ATCO) for subsequent control. After realising the mistake, he was therefore no longer able to contact EZS932 immediately to arrange for corrective measures. He consequently had to instruct SWR1344 to abort the left turn towards DALIK which he had previously ordered. Seconds later he additionally instructed an immediate change in heading to the right ("turn immediately right"), in order to reduce the risk of a collision.

During the first contact with the APE ATCO, EZS932 reported a heading of 120° at 5000 ft. The APE ATCO recognised the impending separation infringement with SWR1344 and instructed the EasyJet aircraft to turn left, onto a northerly heading. EZS932 obeyed this request slowly.

The two aircraft subsequently closed to a point with a lateral separation of 2 NM and an altitude difference of 0 (zero) ft for a time.

All times in this report are in the UTC format (local time –2 hours)

The immediate reaction of the crew of SWR1344 to the change in heading finally ordered by the ATCO and their continuous climb soon led to a reestablishment of the minimum separation values.

Both Swiss International Airlines and the air navigation services company skyguide submitted an ATIR.

FINDINGS

- Both aircraft were flying in Class C controlled airspace.
- Both aircraft were flying according to instrument flight rules (IFR).
- SWR1344 was in uninterrupted radio contact with the aerodrome controller. EZS932 too was initially in radio contact with the aerodrome controller but was handed over by him to Approach Control East before the critical convergence.
- At 08:25:43 EZS932 reported "fully established ILS 14".
- At 08:25:57 SWR1344 received clearance for take–off from runway 16 from the ADC ATCO. At this time EZS932 was approximately 3.5 NM from the threshold of runway 14.
- At 08:26:47 EZS932, which was approaching runway 14, stated that it was initiating a go-around. SWR1344 was taking off from runway 16 at about the same time.
  The next aircraft approaching runway 14 was 8.5 NM behind EZS932.
- At 08:27:01 the ADC ATCO instructed SWR1344 to maintain the runway 16 heading.
- At 08:27:11, the ADC ATCO issued traffic information concerning SWR1344, which had previously taken off.
- At 08:27:32 the ADC ATCO instructed EZS932 to turn left onto heading 020°. The co-pilot of EZS932 confirmed this instruction correctly. At this time, the aircraft was passing 3000 ft/QNH, climbing.
  However, EZS932 did not comply with this instruction and instead assumed a heading of approximately 120°.
- At 08:27:51, the ADC ATCO gave SWR 1344 clearance to climb to flight level 110. SWR1344 confirmed this clearance.
- At 08:28:04 the ADC ATCO instructed SWR1344 to turn left in the direction of DALIK. SWR1344 also confirmed this instruction.
- At 08:28:15 the ADC ATCO instructed EZS932 to make contact with Approach Control East. The pilots confirmed this instruction; at this time they were passing approximately 4300 ft, climbing.
- At 08:28:32 EZS932 called the APE ATCO as follows: "Zurich grüezi, EZS932, approaching five thousand feet, on heading one two zero". The APE ATCO first asked for confirmation of this flight parameter and then instructed EZS932 to turn left, onto a northerly heading.
- At 08:28:43 the ADC ATCO instructed SWR1344 as follows: "SWR1344, stop turn heading zero five zero". Immediately afterwards, he issued the following new instruction to SWR1344: "SWR1344, turn immediately right heading, right heading one zero zero".

All times in this report are in the UTC format (local time –2 hours)

- Once SWR1344 had confirmed these messages, the ADC ATCO issued it with traffic information as follows: "SWR1344, traffic coming twelve o'clock, range two miles, five thousand feet". For its part, SWR1344 was at this time also passing 5000 ft, climbing. It answered this traffic information as follows: "Roger on TCAS, but it turns same direction as we do". The Swiss aircraft carryied out the instructed right turn onto heading 100° without delay.
- At 08:29:40 the ADC ATCO now instructed SWR1344 to turn left onto heading 360°. The conflict was resolved; the two aircraft then had a lateral separation of more than 3 NM and an altitude difference of 1000 ft, with both parameters increasing.
- skyguide's operating procedures specified that under instrument meteorological conditions (IMC) take-offs from runway 16 should take place only for "performance reasons" and that in such cases a take-off clearance may be given only if any aircraft approaching runway 14 is no closer than 5 NM to the threshold of runway 14. An approach separation of 6 NM on runway 14 was to be imposed for the duration of take-offs from runway 16.
  Under visual meteorological conditions (VMC), skyguide did not consider that any special procedures were necessary, because "it is highly probable that sufficient time will remain for corrective measures (traffic information, short-term vertical separation, short-term heading correction)". In such cases it was up to the daily operations manager (DOM, on duty in the tower) to judge whether visibility and/or cloud permitted traffic information to the south-east of the airport. If this was not the case, the IMC procedures were also to be applied.
- At 08:18 the DOM noted in the tower logbook: "Shower moving over aerodrome: despite few 1100, sct 1300, bkn 7000 ft it's IMC; info CAP". At the same time as the information to the CAP (Approach Coordinator), the DOM instructed approach control to guarantee 6 NM approach separation immediately in order to allow take-offs from runway 16.
- Shortly after this logbook entry, the DOM left the tower, in order, according to his statements, to "provide forms which had run out" and "to update the briefing board". Before leaving the tower, the DOM handed over operations management to the ground controller/coordinator (GRO ATCO).
- At about 08:22 and at 08:24 two aircraft took off from runway 16. According to the GRO ATCO's and ADC ATCO's statements, they both realised at about this time that the weather in the southern sector of the aerodrome, i.e. in the runway 16 departure sector, had improved and that one or both of these departures "disappeared into the clouds at an approximate altitude of 4000 ft/QNH". According to the ADC ATCO's statement, it had also stopped raining.

  On the basis of this observation, these two ATCO's jointly decided thereafter to re-apply VMC procedures for take-offs from runway 16, i.e. no longer to impose time separation between approaches on runway 14 and take-offs on runway 16. The CAP was not informed of this decision. According to the electronic recording, SWR1344 then took off at 08:27:00.
- After his return to the tower, which took place according to his statements after some 5 to 10 minutes, the DOM was informed by the two ATCOs of the airprox which had occurred between EZS932 and SWR1344 in his absence. According to his statements, this made no sense to him, as IMC conditions were in force when he left the tower. He recorded the airprox incident in the logbook and completed it as follows on the basis of the information from the GRO ATCO and the ADC ATCO: "Between ~ 8:20 – 8:35 VMC conditions prevailed".

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At the time of his interrogation, the DOM was not able to recall the weather conditions at the time of his return to the tower and made the following statement: "In order to restore some calm to operations after this near-miss, I imposed IMC again despite VMC conditions".

- During his interrogation, the ADC ATCO explained that shortly before the landing (or rather go-around) of EZS932 he had noticed that this aircraft "was approaching somewhat faster than usual". However, at that point he did not feel obliged to consider the possibility of a go-around. He further declared that he had observed on the radar display that EZS932 had initiated its go-around even before its corresponding radio transmission.
- At the time of his interrogation the commander (CMD) of EZS932 as pilot flying (PF) was not able to recall that after he had initiated the go-around he had received the instruction from ATC or from his F/O to turn left onto heading 020°. According to his statement he followed the heading of 120° displayed on his flight director. He assumed that it was the heading assigned by ATC and set by the F/O on the mode control panel (MCP).

  As an explanation for the lack of perception of the 020° heading instruction received, either by himself or by the F/O, the CMD mentioned the high workload during the go-around procedure. This was generated on the one hand by the go-around procedure in itself (the go-around had to be flown manually – with autopilot/autothrottle off). On the other hand there were apparently other difficulties, e.g. the ATC request to expedite the climb, the weather situation with some thunderstorms on their weather radar and the traffic information received about the aircraft taking off from runway 16.

  The CMD further stated that the intensity of the rain increased during the final approach and that it had also rained during the go-around. Furthermore he stated that after the go-around the cloud ceiling was at about 1000 ft/AGL and that they were completely in cloud at about 1500 ft/AGL.
- The CMD of EZS932 had been transferred to EasyJet for a limited period by a company which hired out pilots. He also worked regularly for other airlines which apply different standard operating procedures (SOP).
- At the time of his interrogation the co-pilot of EZS932 as pilot non flying (PNF) was not able to recall receiving the "turn left heading 020°" instruction from ATC. The fact that he evidently correctly confirmed the instruction received from ATC but omitted to enter this heading of 020° in the MCP and instead set a value of 120° was attributed by him to confusion. He probably confused the instruction "turn left heading 020°" with "turn left by 20 degrees". The F/O put forward the high workload associated with the go-around procedure as an explanation for the failure to perceive the 020° heading instruction which was received.
- The co-pilot of EZS932 further explained that he apparently forgot to set the go-around altitude on the altitude preselector. Convergence with the ILS glide path apparently took place "in a rush", at an excessively high speed.
- After the subsequent contact with the APE ATCO the co-pilot gave as a reason for the go-around the fact that they were flying too high and too fast and that there was also a tailwind.
- In his comments, the CMD of SWR1344 stated that the weather situation when their aircraft had taken off was characterised by thick cloud, especially in sectors S/SSE/SSW (i.e. the departure direction) and that there was light precipitation. After take-off, he said that they were very soon, i.e. at about 1000 ft/AGL, in "full IMC" (i.e. in cloud, with no

visibility). They said they had taken the avoiding action as instructed by ATC without delay by using the touch control steering button (TCS), which allowed a fast reaction without switching off the autopilot.

- At the time of the incident there was moderate to heavy traffic.
- At the time of the incident the DOM was not present in the tower.
- At the time of the incident workstation ADC 2 was not in service.
- No risk assessment concerning the procedure applied in this case had been carried out.
- The two flight crews involved were in possession of the valid licences necessary to exercise their activity.
- The air traffic controllers involved were in possession of the valid licences necessary to exercise their activity.
- Weather: INFO OSCAR

  QAM LSZH 07:50
  Wind: 240°, 6 knots
  Ground visibility: 15 KM
  Cloud: FEW at 1100 FT/GND, SCT at 1300 FT/GND, BKN at 7000 FT/GND
  Temperature: +16°, dew point: +15°
  QNH 1013 hPa
  TEMPO VIS 5000 M, rain showers

- INFO PAPA

  QAM LSZH 08:20
  Wind: 260°, 3 knots
  Ground visibility: 5000 M
  Rain showers
  Cloud: FEW at 1000 FT/GND, SCT at 1500 FT/GND, BKN at 5000 FT/GND
  Temperature: +16°, dewpoint +15°
  QNH 1014 hPa
  TEMPO VIS 5000 M, rain showers
  NOSIG

- Weather at the time of the incident (08:28) 6 NM south-east of KLO VOR:

  Weather situation: Onset of a cold front passing through
  Wind at 5000 – 10000 FT/MSL: south-west wind at 25-35 knots
  Ground visibility: 4-8 km
  Rain showers
  Cloud: FEW at 1000 FT/GND, SCT at 1500 FT/GND, BKN at 5000 FT/GND
  QNH 1014 hPa

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ANALYSIS

Air traffic control

Separation of departing aircraft from approaching aircraft

The operating concept applied in this case, with landings on runway 14 and take-offs on runway 16, requires air traffic control, in the case of an unexpected go-around on runway 14, to guarantee separation with regard to any take-off from runway 16.

skyguide management had therefore issued operating instructions according to which, under instrument meteorological conditions (IMC), departures from runway 16 must be time-separated from approaches to runway 14, whereas no special procedures are considered necessary under visual meteorological conditions (VMC). skyguide justifies this arrangement by noting that in the event that two such flight movements coincide in VMC "it is highly probable that sufficient time will remain for corrective measures (traffic information, short-term vertical separation, short-term heading correction)".

According to their statements, in the case of the present incident the competent air traffic controllers were of the opinion that the prevailing meteorological conditions would justify the application of VMC procedures. On the other hand, the statements of the two flight crews, the weather developments and the meteorological analysis issued by Meteosuisse for the time of the incident permit the conclusion that the prevailing weather conditions made visual traffic information impossible. The analysis of the weather situation south-east of the aerodrome (which is where critical situations may occur) by ATC was evidently inaccurate.

The present incident shows that in applying these procedures ATC was not able to ensure separation in all cases. The ATC assumption that "it is highly probable that sufficient time will remain for corrective measures (traffic information, short-term vertical separation, short-term heading correction)" proved to be inapplicable and was not able to resolve the separation problem. On the one hand the flight crew of EZS932 did not obey the ATC instruction, and on the other hand the weather conditions did not permit any visual traffic information, or rather the flight crews were not able to establish reciprocal visual contact.

The distinction between IMC and VMC conditions implemented by ATC is not appropriate. Aircraft, particularly larger aircraft for transporting passengers and freight, are restricted in their manoeuvrability during the flight phases immediately after take-off and after initiating a go-around procedure and therefore have only a limited ability to comply with avoiding action as instructed by ATC or to comply with traffic information.

A further difficulty with this incident is that the flight paths of all SIDs from runway 16 intersect the flight path of the go-around procedure for runway 14 about 4 NM ESE of KLO VOR. Consequently no procedural separation whatsoever exists between these two flight paths. A procedure of this type should essentially not be designed and introduced.

Moreover, the ICAO recommends that except for reasons of safety, during take-off among other things (and hence also during a go-around) and during the last part of a final approach, no transmissions should be made to aircraft (ICAO Annex 10, Aeronautical Telecommunications, chapter 5, § 5.2.1.7.3.1.1). This recommendation is based on the knowledge that in the flight phases mentioned control of the aircraft demands maximum concentration and the flight crew is fully occupied exercising such control.

Thus here, in order to ensure separation, a procedure was prescribed and applied which should have been applied only in exceptional cases for reasons of safety. This procedure is not appropriate for ensuring systematic separation.

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skyguide operating procedures in a tense political environment
In the autumn of 1996 the former Swissair company introduced the so-called 'fourth wave of departures'. This was accompanied by a marked increase in the number of departures from runway 16. Subsequently, a number of critical occurrences of go-arounds on runway 14 with simultaneous take-offs from runway 16 caused skyguide to attempt to achieve consistent separation of the two flight paths in order to be able to guarantee systematic separation between such flight movements.

Analysis of copious correspondence between the different aviation institutions involved (skyguide, FOCA, the Zurich cantonal government, Unique, the former Swissair, etc.) shows that for political reasons it was not possible to achieve such separation of the flight paths in question by establishing a new SID. The solution subsequently agreed upon and applied in this case, time separation of approaches and departures under IMC only, was in the final analysis a compromise.

The role of the DOM (Daily Operations Manager)
The DOM, as supervisor, is directly responsible for operations. Under the given circumstances – a critical weather situation, rather heavy traffic, one workstation not manned because of a shortage of personnel, the relative inexperience of the ADC ATCO – the brief non-urgent absence of the DOM from his workstation in the tower was not appropriate at that time. It would have been appropriate first to monitor and verify the further developments in the weather and the implementation of the decision which had been made before the DOM should have considered being absent from the workstation.

The GRO ATCO, who had temporarily taken over the tasks of the DOM, was not trained for this function

Handling of the situation by the ATCOs in the tower
Both the ADC ATCO and the GRO ATCO had noted that shortly before the incident, in accordance with the weather developments, "tech IMC" had been brought into effect by the DOM. Since a decision of this kind involves a number of consequences on traffic handling, it was undoubtedly preceded by a careful analysis of the weather situation to the south-east of the airport. According to the observations of the ADC ATCO and the GRO ATCO, however, the weather situation had improved to such an extent that a few minutes after this decision, application of the "tech IMC" procedures was no longer necessary.

At this time there was substantial traffic: the ADC ATCO had to perform the tasks of the aerodrome control unit on his own. The envisaged working position ADC 2 was not manned. The ADC ATCO decided together with the GRO ATCO, who during the DOM's absence was fulfilling the latter's function, to cease applying the "tech. IMC" procedures. As the subsequent incident and its accompanying circumstances show, in this case they had made an inaccurate evaluation of the weather situation.

The weather situation did not permit a lifting of the "tech. IMC" procedures. The next aircraft approaching runway 14 was 8.5 NM behind EZS932, so it would have been possible for SWR1344 to take off without risk about 90 seconds later. Though the ADC ATCO had noted the rapid approach of EZS932, this realisation obviously did not impel him to take a more defensive approach to traffic handling.

The initial heading 020° instruction to EZS932 was indeed appropriate for resolution of the conflict. On the other hand, the subsequent handling of the conflict was not appropriate in all respects. On the one hand, compliance with this instruction was incompletely monitored; on the other hand the early change of frequency made rapid establishment of contact with EZS932 impossible.

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The actual handling of the conflict by the ADC ATCO was not appropriate in all respects. The instruction to EZS932 to expedite its climb was rather counterproductive, as SWR1344 was taking off at the same time and would therefore take even longer to attain a higher altitude than the EZS932 which was in the early phase of its go-around. Restricting the initial climb of EZS932 to 4000 ft/QNH would have had a greater chance of success. Moreover, the early hand-over of this aircraft to the APE ATCO made it impossible to contact it quickly once it became apparent that EZS932 was not obeying the instruction to make a sharp left turn onto heading 020°.

Airmanship of the EZS932 flight crew

On alignment with the instrument landing system (ILS), the flight crew of EZS932 found itself in a 'rushed approach' situation. The aircraft was flying too high and too fast. Consequently the flight crew was under great pressure in terms of time and decision-making, which then led to omission of the "set go-around altitude" SOP and finally resulted in the closed loop between the two pilots being broken. This development was further favoured by the fact that in a go-around the generation of aircraft used by EasyJet in this case (B-737-300/400/500) initially demands a swift and major change in attitude followed by a rapid sequence of manipulations which take place close to the ground and at a high rate of climb.

The CMD's activity for different airlines with different SOPs, along with the ATC's instructions during a delicate flight phase, may possibly have had a negative effect. The CMD finally reacted correctly to the unstabilised approach by initiating a go-around.

Airmanship of the SWR1344 flight crew

The flight crew of SWR1344 had attentively monitored the radio communication between ATC and the EasyJet aircraft and was therefore at least able to observe the convergence of the two aircraft on their ACAS display. The SWR1344 CMD's rapid and consistent implementation of the avoiding manoeuvre ordered by ATC subsequently contributed substantially to the swift re-establishment of the minimum separations.

ACAS

Both aircraft were equipped with ACAS, software version 7.0. The closest point of approach occurred at 08:29:11. At this time the lateral separation between the two aircraft was 2 NM and the altitude difference was 400 ft. None of the ACAS devices triggered a proximity alert, traffic advisory or resolution advisory.

EZS932 had already been flying horizontally at 5000 ft (mode C read-out 5100 ft) on heading 120° for some 10 seconds and was about to initiate the left turn onto heading 360° as instructed by the APE ATCO.

SWR1344 had been cleared even earlier to FL 110, when it was still flying straight on the runway heading. At the time of the closest approach it was passing 5500 ft, climbing, on a heading of 050° with a rate of climb of about 2000 ft/minute. If at this time neither of the aircraft had received a change in direction, i.e. without the instructions from the ADC ATCO "SWR 1344 , turn immediately right heading, right heading one zero zero" and without the instruction from the APE ATCO "EZS932, turn left, left turn on heading north", then the altitude difference between the two aircraft when their flight paths crossed would have been about 1000 ft. The rate of climb of SWR1344 thus meant that the closest point of approach (CPA) calculated within seconds in both aircraft by the ACAS equipment at no time reached the necessary limit value for triggering a traffic advisory (TA) or resolution advisory (RA).

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CAUSE

The incident is attributable to the fact that

- ATC had conceived and applied a procedure which was not appropriate for the prevailing situation.
- though the flight crew of EZS932 did in fact correctly confirm an ATC instruction "EZS932, turn left heading 020") they did not obey it. Non-compliance with this instruction indicates an error in the closed loop (reciprocal surveillance) within the cockpit crew.

SAFETY RECOMMENDATION NO. 369

The Federal Office for Civil Aviation should arrange that for traffic situations such as the one under consideration ATC applies procedures which guarantee minimum separation under all circumstances, both in IMC and in VMC.

Berne, 10 June 2005 Aircraft Accident Investigation Bureau

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TRANSCRIPT OF TELEPHONY

OR RADIOTELEPHONY COMMUNICATION TAPE-RECORDINGS

Investigation into the **incident** that occured on **30.08.2003**

- Subject of transcript:	**EZS932 / SWR1344**
- Centre concerned:	Swiss Radar Area East
- Designation of unit:	Radar Lower Sector West Zurich Arrival Sector West
- Frequency / Channel:	135.675 MHz 118.000 MHz
- Date and period (UTC) covered by attached extract:	30.08.2003 08:13 - 08:26 UTC
- Date of transcript:	14th April 2005
- Name of official in charge of transcription:	Claudio DI PALMA

- Certificate by official in charge of transcription:

I hereby certify:

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

Zürich, 14th April 2005

Claudio DI PALMA

Abbreviations

Sector		Designation of sector
W RE	-	Radar Lower Sector West
APW	-	Zurich Arrival Sector West

Aircraft	-	Callsign	Type of acft	Flight rules	ADEP	-	ADES
932	**-**	**EZS932**	**B733**	**IFR**	**EGGW**	**-**	**LSZH**
602	-	HEJ602	A320	IFR	LGAV	-	LSZH
2089	-	SWR2089	A319	IFR	LPPT	-	LSZH
2657	-	SWR2657	SB20	IFR	LFTZ	-	LSZH

DMO / 14th April 2005

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5

Frequency: 135.675 MHz Radar Lower Sector West

W RE	**932**	**08:13:04**	**Swiss Radar "grüezi" Topswiss niner three two descending level two hundred to Bravo Lima Mike**
932	**W RE**	**:10**	**"Grüezi" Topswiss niner three two identified, cleared Bravo Lima Mike three Echo**
W RE	**932**	**:14**	**Cleared Bravo Lima Mike three Echo Topswiss nine three two**
932	**W RE**	**:17**	**Report your speed**
W RE	**932**	**:19**	**Äh… two seven five, Topswiss nine three two**
932	**W RE**	**:22**	**Roger continue with speed**
W RE	**932**	**:23**	**Maintain speed, nine three two**
			1 station in between
932	**W RE**	**08:15:32**	**Easy niner three two descend to flight level one two zero, cross Bravo Li… Bravo Lima Mike one five zero or above**
W RE	**932**	**:39**	**Descend level one two zero to cross Bravo Lima Mike one five zero or above Topswiss nine three two**
			3 stations in between
W RE	**932**	**08:18:02**	**Äh… Topswiss nine three two can we increase speed three hundred knots?**
932	**W RE**	**:10**	**Niner three two… affirm**
W RE	**932**	**:13**	**Thank you, increasing speed three hundred, Topswiss nine th…**
932	**W RE**	**:16**	**And give me a rate of two thousand or greater**

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
W RE	**932**	**08:18:19**	**Two thousand or greater Topswiss nine three…**	
932	**W RE**	**08:19:00**	**Topswiss niner three two for further instruction Arrival one one eight decimal zero bye-bye**	
W RE	**932**	**:04**	**One one eight zero "merci" bye Topswiss nine three two**	

Frequency: 118.000 MHz Zurich Arrival Sector West

APW	**932**	**08:19:17**	**Arrival "grüezi" Topswiss nine three two descending level one two zero ..... we have Oscar, speed three hundred knots**	
932	**APW**	**:25**	**Topswiss nine three two Arrival good morning, left heading zero eight zero vectors, no delay to the ILS one four, descend to flight level six zero**	
APW	**932**	**:33**	**Left turn heading zero eight zero vectors for ILS one four and descend level six zero Topswiss niner three two**	
602	APW	:40	Hellas Jet six zero two contact Tower one one eight decimal one good-bye	
APW	602	:43	Eighteen decimal one Hellas Jet six zero two bye	
APW	2089	:46	"Züri Arrival Swiss two zero eight nine guete Morge" flight level one three zero information Oscar, Airbus three-nineteen	
2089	APW	:51	Swiss two zero eight nine Arrival "grüezi" descend to flight level one two zero, vectors ILS one four	
APW	2089	:56	Descend flight level one two zero, vectors ILS one four Swiss two zero eight nine	
APW	2657	08:20:03	"Züri grüezi" Swiss two six five seven, level one four two descending äh… maintaining one four zero äh… information Oscar	

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
2657	APW	08:20:10	Swiss two six five seven Arrival "grüezi" vectors ILS one äh… four, descend to flight level one three zero	
APW	2657	:16	Descend level one three zero Swiss two six five seven four one four	
2657	APW	08:21:35	Swiss two six five seven reduce speed to two two zero knots	
APW	2657	:39	Reducing two two zero knots Swiss two six five seven	
2089	APW	:42	Swiss two zero eight niner descend flight level six zero, reduce speed to two two zero knots	
APW	2089	:47	Descend flight level six zero, speed two-twenty Swiss two zero eight nine	
932	**APW**	**08:22:43**	**Topswiss niner three two descend to four thousand feet, QNH one zero one four**	
APW	**932**	**:50**	**Descend four thousand feet, QNH one zero one four Topswiss nine three two**	
2089	APW	:58	Swiss two zero eight niner, two seven track miles continue present heading, vectoring VOR DME correction vectoring ILS approach runway one four, reduce speed to two zero zero knots	
APW	2089	08:23:08	Continue present heading, vectoring ILS one four, speed two hundred Swiss two zero eight nine	
2657	APW	:12	Swiss two six five seven descend to flight level one two zero, expect three five track miles	
APW	2657	:18	Descend level äh… one two zero Swiss two six five seven, that's copied	
932	**APW**	**:24**	**Topswiss niner three two turn right heading one one zero, cleared ILS approach runway one four**	
APW	**932**	**:29**	**Right turn heading one one zero, cleared ILS one four Topswiss nine three two**	
2657	APW	:48	Swiss two six five seven reduce speed to one eight zero knots	
APW	2657	:52	Reduce speed one eight zero knots Swiss two six five seven	

TRANSCRIPT SHEET

Occurrence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
2089	APW	08:24:11	Swiss two zero eight niner turn right heading zero five zero for right base	
APW	2089	:15	Right heading zero five zero, Swiss two zero eight nine	
2657	APW	:19	Swiss two six five seven, descend to flight level six zero continue present heading, vectoring ILS approach runway one four	
APW	2657	:26	Descend six zero and maintain present heading for äh… vectoring one four, Swiss two six five seven	
2089	APW	08:25:04	Swiss two zero eight niner reduce speed to one eight zero knots	
APW	2089	:07	Speed one eight zero knots Swiss two zero eight nine	
932	**APW**	**:10**	**Easy… na… correction Topswiss niner three two contact Zurich Tower one one eight decimal one, good-bye**	
APW	**932**	**:16**	**One one eight one "merci" bye, Topswiss nine three two**	

- end -

Signature of person
in charge of transcription :

TRANSCRIPT OF TELEPHONY

OR RADIOTELEPHONY COMMUNICATION TAPE-RECORDINGS

Investigation into the **incident** that occured on **30.08.2003**

- Subject of transcript:	**EZS932 / SWR1344**
- Centre concerned:	Swiss Radar Area East
- Designation of unit:	Zurich Tower (Aerodrome Control 1) / Zurich Arrival Sector East
- Frequency / Channel:	118.100MHz / 120.750MHz
- Date and period (UTC) covered by attached extract:	30.08.2003 08:22 - 08:30 / 08:28 - 08:36 UTC
- Date of transcript:	12 September 2003
- Name of official in charge of transcription:	Bettina COMTE

- Certificate by official in charge of transcription:

  I hereby certify:

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

Zürich, 12 September 2003

Bettina COMTE

Abbreviations

Sector		Designation of sector
ADC1	-	Aerodrome Control 1
APE	-	Zurich Arrival Sector East
T-APE	-	Telefon Intercom Zurich Arrival Sector East
T-ADC1	-	Telefon Intercom Aerodrome Control 1

Aircraft	-	Callsign		Type of acft	Flight rules	ADEP	-	ADES
1344	**-**	**SWR1344**	**Swiss**	**E145**	**IFR**	**LSZH**	**-**	**EPWA**
40	-	SWR40	Swiss	MD11	IFR	LSZH	-	KLAX
602	-	HEJ602	Hellasjet	A320	IFR	LGAV	-	LSZH
390	-	SWR390	Swiss	E145	IFR	LSZH	-	EGCC
3630	-	DLH3630	Lufthansa	B733	IFR	EDDF	-	LSZH
1416	-	SWR1416	Swiss	A320	IFR	LSZH	-	LYBE
425	-	CLC425	Classic Air	DC3	VFR	LSZH	-	?
1804	-	SWR1804	Swiss	A320	IFR	LSZH	-	LTBA
1326	-	SWR1326	Swiss	A320	IFR	LSZH	-	UUDD
932	**-**	**EZS932**	**Topswiss**	**B737**	**IFR**	**EGGW**	**-**	**LSZH**
455	-	EDW455	Edelweiss	A332	IFR	MDPC	-	LSZH
601	-	SAS601	Scandinavian	MD87	IFR	EKCH	-	LSZH

OZEO-cb / 12 September 2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
Frequency: Zurich Tower (Aerodrome Control 1) 118.100MHz				
ADC1	**1344**	**08:22:02**	**Tower "guete morge", SWR1344 on ECHO for one six, we are ready**	
1344	**ADC1**	**:05**	**SWR1344 Tower "grüezi", behind Airbus line up runway one six and wait behind**	
ADC1	**1344**	**:10**	**behind Airbus line up one six behind, SWR1344**	
40	ADC1	:12	SWR40, behind Embraer line up runway one six and wait behind	
ADC1	40	:19	äh…say again for SWR40?	
40	ADC1	:21	SWR40, behind Embraer line up runway one six and wait behind	
ADC1	40	:24	line up one six behind Embraer, SWR40, behind	
602	ADC1	:30	HEJ602, right as convenient, contact Apron one two one decimal eight five	
ADC1	602	:35	two one decimal äh..eight five, HEJ äh..602	
390	ADC1	:55	SWR390, contact Departure, "adee"	
ADC1	390	:58	Departure, "tschüss", SWR390	
ADC1	3630	:23:23	Tower hello again, DLH3630	
3630	ADC1	:25	hello DLH3630, JULIETT, cross runway two eight, contact Apron one two one decimal seven five	
ADC1	3630	:32	DLH3630, XXXXX to cross runway two eight and when cross one two one eight five one two one seven five, DLH3630	could be "able"
3630	ADC1	:40	one two one seven five is correct, DLH3630	
1416	ADC1	:44	SWR1416, wind two three zero degrees five knots, runway one six cleared take-off	

TRANSCRIPT SHEET

Occurence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
ADC1	1416	08:23:49	cleared take-off runway one six, SWR1416	
ADC1	425	:24:23	Zurich Tower, CLC425, holding point two eight, VFR-route äh..one	
425	ADC1	:34	CLC425, Tower "grüezi", line up runway two eight and wait	
ADC1	425	:38	lining up runway two eight and wait, CLC425	
1416	ADC1	:55	SWR1416, contact Departure "adee"	
ADC1	1416	:58	Departure, SWR1416	
ADC1	1804	:25:14	Tower "grüezi", SWR1804, in sequence one six	
1804	ADC1	:16	1804 Tower, behind the MD eleven line up runway one six, wait behind	
ADC1	1804	:21	behind MD eleven line up on one six and wait behind, SWR1804	
ADC1	1326	:29	"Züri Tower" SWR1326 "guete morge", approaching holding point one six	
1326	ADC1	:34	SWR1326, Tower "grüezi", behind Airbus line up runway one six and wait behind	
ADC1	1326	:38	behind Airbus line up one six behind, SWR1326	
ADC1	**932**	**:43**	**Tower "grüezi" EZS932, fully established ILS one four**	
932	**ADC1**	**:48**	**EZS932 Tower, wind two eight zero degrees six knots, runway one four cleared to land**	
ADC1	**932**	**:55**	**cleared to land, EZS932**	
1344	**ADC1**	**:57**	**SWR1344, wind two four zero degrees five knots, runway one six cleared for take-off**	
ADC1	**1344**	**:26:02**	**cleared take-off runway one six, SWR1344**	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
ADC1	602	08:26:12	Tower good morning again, HEJ602 on JULIETT holding short	
602	ADC1	:18	HEJ602 Tower, hold short of runway two eight	
ADC1	602	:21	hold short	
		:25	???????	two or more stations garbeled
ADC1	**932**	**:47**	**EZS932 going around**	
932	**ADC1**	**:50**	**roger EZS932, please expedite climb until reaching five thousand feet**	
ADC1	**932**	**:58**	**expediting climb to five thousand feet, EZS932**	
1344	**ADC1**	**:27:01**	**SWR1344, due go around continue runway heading**	
ADC1	**1344**	**:05**	**continue on the runway heading, SWR1344**	
932	**ADC1**	**:11**	**EZS932, your traffic is Embraer departing on one six right now, at your one o'clock position, range two miles southbound**	
ADC1	**932**	**:20**	**okay, we have on TCAS, thank you ?????**	**unreadable, probably "EZS932"**
ADC1	455	:23	Tower hello again, EDW455, holding still short of two eight	
455	ADC1	:29	"ja" call you back Edelweiss	
ADC1	455	:32	okay	
932	**ADC1**	**:32**	**EZS932, turn left heading zero two zero**	
ADC1	**932**	**:35**	**left turn heading zero two zero, EZS932**	
ADC1	601	:38	Tower good morning, SAS601, final one four	
601	ADC1	:41	SAS601 Tower, good-day to you, wind two eight zero degrees three knots, runway one four cleared to land	
ADC1	601	:48	SAS601	
1344	**ADC1**	**:51**	**SWR1344, climb to flight level one one zero**	

Signature of person
in charge of transcription :

TRANSCRIPT SHEET

Occurence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
ADC1	**1344**	**08:27:55**	**flight level one one zero, present heading, SWR1344**	
1344	**ADC1**	**:58**	**correct**	
ADC1	236	:59	Zurich Tower "grüezi", SWR236, approaching holding two eight, ready for departure	
236	ADC1	:28:03	call you back	
1344	**ADC1**	**:04**	**SWR1344, left to DALIK**	
ADC1	**1344**	**:07**	**left DALIK, SWR1344**	
932	**ADC1**	**:15**	**EZS932, contact Arrival one two zero decimal seven five**	
ADC1	**932**	**:19**	**two zero seven five, EZS932**	
455	ADC1	:23	EDW455, taxiway FOXTROT, cross two eight, Apron one two one seven five	
ADC1	455	:28	crossing two eight at FOX, EDW455	
602	ADC1	:32	HEJ602, JULIETT, cross two eight, Apron one two one decimal seven five	
ADC1	602	:37	on JULIETT, cross two eight, two one seven five, HEJ602	
1344	**ADC1**	**:43**	**SWR1344, stop turn heading zero five zero**	
ADC1	**1344**	**:46**	**stop turning at heading zero five zero, SWR1344**	
1344	**ADC1**	**:53**	**SWR1344, turn immediately right heading , right heading one zero zero**	
ADC1	**1344**	**:58**	**heading one hundred, SWR1344**	
1344	**ADC1**	**:29:01**	**SWR1344, traffic coming twelve o'clock, range two miles, five thousand feet**	
ADC1	**1344**	**:07**	**roger, on TCAS, but it turns same direction as we do**	
ADC1	601	:12	SAS601, short final	
601	ADC1	:14	SAS601, cleared to land one four, wind two eight zero degrees four	
ADC1	601	:17	cleared to land one four, SAS601	

Signature of person
in charge of transcription :

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
1344	**ADC1**	**08:29:40**	**SWR1344, now left heading three six zero**	
ADC1	**1344**	**:43**	**left heading three six zero, SWR1344**	
1344	**ADC1**	**:30:02**	**SWR1344, report heading to Departure, contact fun….one two five decimal nine five**	
ADC1	**1344**	**:08**	**one two five nine five, report heading, SWR1344, good-bye**	

Frequency: Zurich Arrival Sector East 120.750MHz

APE	**932**	**08:28:32**	**Zurich "grüezi" EZS932, approaching five thousand feet, on heading one two zero**
932	**APE**	**:40**	**confirm EZS932 calling?**
APE	**932**	**:43**	**affirm, five thousand feet, heading one two zero**
932	**APE**	**:46**	**EZS932, turn left, left turn on heading north**
APE	**932**	**:51**	**left turn heading north, EZS932**
			one station in between
932	**APE**	**:30:08**	**EZS932, turn left heading three two zero, for downwind; confirm you're ready for approach again?**
APE	**932**	**:15**	**left three two zero downwind, affirm, EZS932**
			on station in between

TRANSCRIPT SHEET

Occurence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
932	**APE**	**08:30:45**	**EZS932, your speed?**	
APE	**932**	**:47**	**reducing äh…two ten, EZS932**	
932	**APE**	**:50**	**roger, then keep two ten until advised**	
APE	**932**	**:52**	**keep two ten, EZS932**	
			four stations in between	
932	**APE**	**:33:16**	**EZS932, left heading two nine zero**	
APE	**932**	**:20**	**left heading two nine zero, EZS932**	
			one station in between	
932	**APE**	**:43**	**EZS932, reduce to one eighty**	
APE	**932**	**:46**	**reducing speed one eight zero, EZS932**	
			three stations in between	
932	**APE**	**:35:23**	**EZS932, left heading two five zero**	
APE	**932**	**:26**	**left heading two five zero, EZS932**	
932	**APE**	**:35**	**EZS932?**	
APE	**932**	**:37**	**yes 932, left turn on heading äh..two five zero**	
932	**APE**	**:41**	**yes, that's fine, just äh..for our books, äh…what was the reason for your go around?**	
APE	**932**	**:47**	**äh… to high and to high speed on approach, EZS932**	

Signature of person
in charge of transcription :

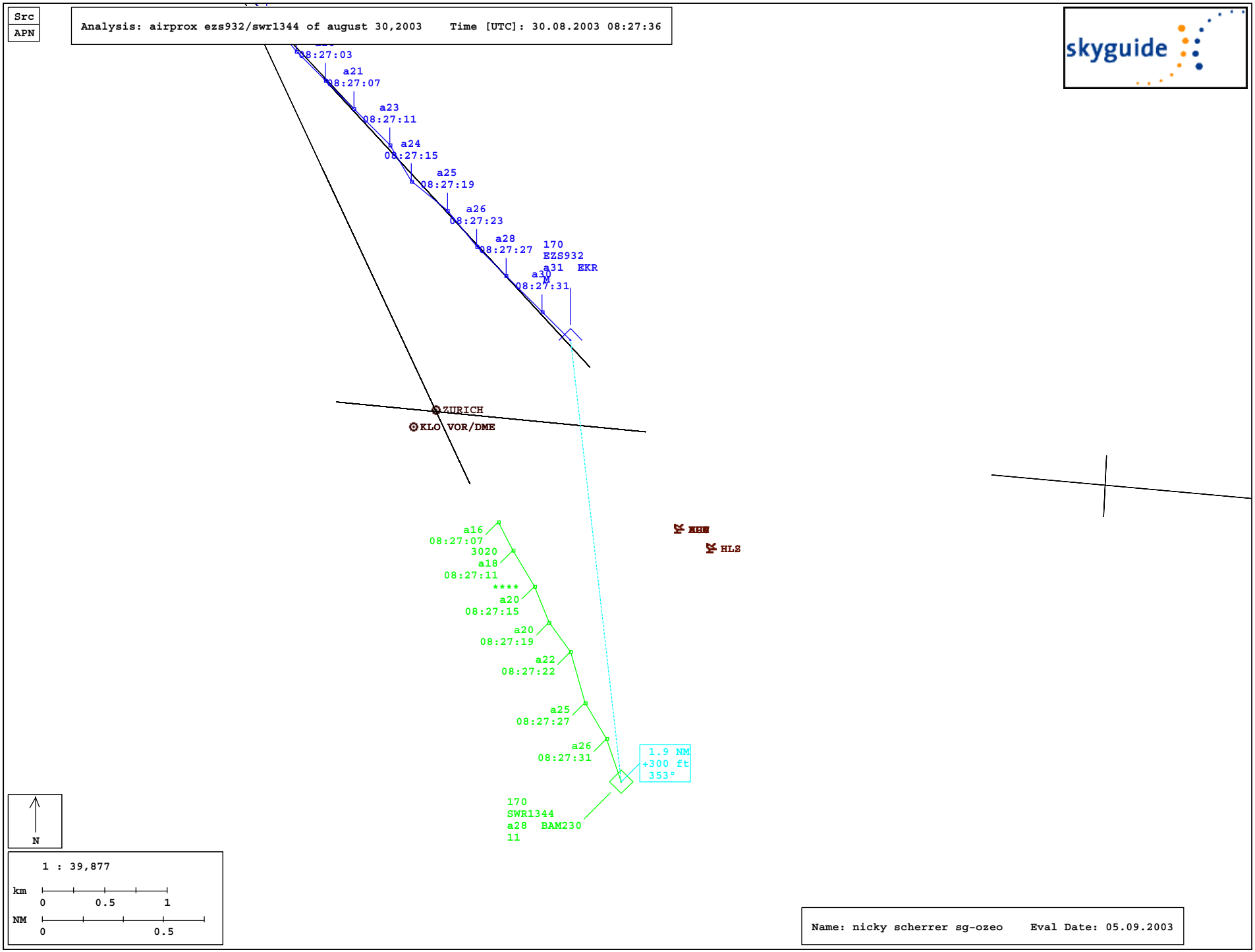
TRANSCRIPT SHEET

Occurence: EZS932 / SWR1344 of 30.08.2003

To Col.1	From Col.2	Time Col.3	Communications Col.4	Observations Col.5
932	**APE**	**08:35:50**	**thank you**	
APE	**932**	**:54**	**there is also a bit tailwind on final**	
932	**APE**	**:58**	**"ja", no problem from our side, absolutely no problem, just for….for that we know whether that this is not a technical problem**	
APE	**932**	**:36:04**	**no, no, not at all**	
			…….	

- end -

Signature of person
in charge of transcription :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EZS932
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08:27:07
3020
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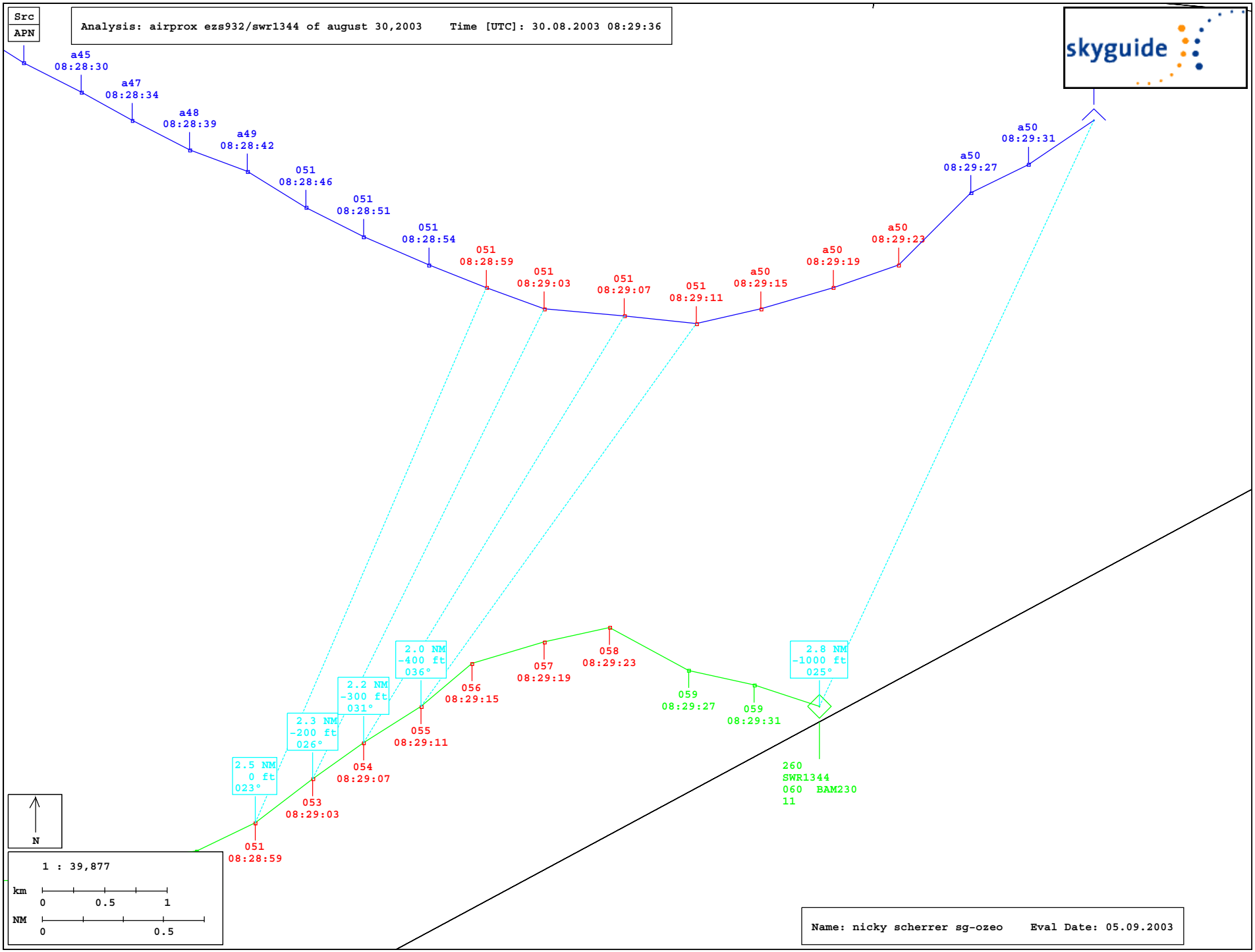
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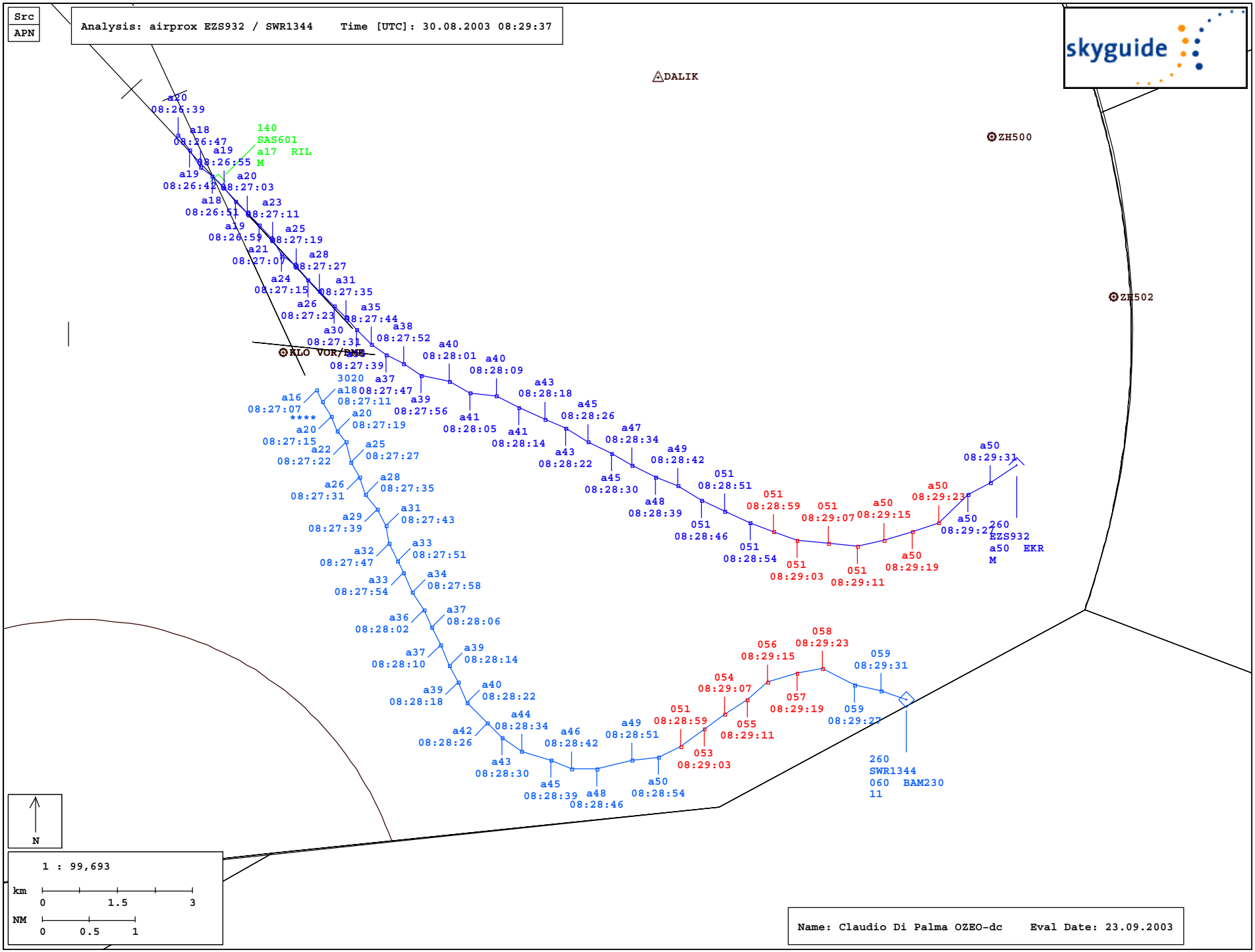
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