



Final Report
by the Aircraft Accident
Investigation Bureau

on the incident

of the aircraft Cessna CE 560XL, HB-VAA
on 2 December 2002
over Lake of Constance

Ursache

Der schwere Vorfall ist darauf zurückzuführen, dass die Wölbungsklappen erst eingefahren wurden, als das Flugzeug die höchstzulässige Geschwindigkeit für den Betrieb mit ausgefahrenen Landeklappen bereits überschritten hatte.

Die folgenden Punkte haben den schweren Vorfall ermöglicht:

- Unvollständige Kommunikation und mangelnde gegenseitige Überwachung der Flugbesatzung (*closed loop*)
- Fehlende Intervention des PNF

Final report

This report has been prepared for the single purpose of accident/incident prevention. The legal assessment of accident/incident causes and circumstances is no concern of the accident investigation (article 24 of the Air Navigation Law)

Aircraft	Cessna CE560XL (Excel)		HB- VAA	
Operator	Schweizerische Eidgenossenschaft, 3003 Bern			
Owner	Schweizerische Eidgenossenschaft, 3003 Bern			
Pilots	PIC:	Swiss citizen, born 1962		
	COPI:	Swiss citizen, born 1962		
Licences	ATPL CH (PIC) and CPL CH (COPI)			
Flight experience	total	7620	in the previous 90 days	131
PIC	on accident type	320	in the previous 90 days	45
Flight experience	total aircraft/ heli	6044	in the previous 90 days	89
COPI	total aircraft	281	in the previous 90 days	36
	on accident type	36	in the previous 90 days	36
Pilots	Over Lake of Constance			
Coordinates	---	ALTITUDE	9176 ft/AMSL	
Date and Time	2 December 2002, 07:53 LT (LT=UTC+1)			
Type of flight	Private Flight / SGF 001 (Government corporate operation)			
Phase of flight	Climb			
Type of incident	Short loss of control due to abrupt nose down movement			
Injuries to persons				
		Crew	Passengers	Others
	Fatal	---	---	---
	Serious	---	---	---
	Minor or none	3	2	
Damage to aircraft	---			
Other damage	---			

History of flight

The crew of the state aircraft HB- VAA received the order on 02 December 2002 to carry out a passenger flight from St. Gallen-Altenrhein to Berne. For this purpose, the aircraft made a positioning flight from Berne to St. Gallen-Altenrhein before. After boarding the passengers at St. Gallen-Altenrhein the aircraft taxied to the runway. Before the take off, a normal take off briefing was carried out. The crew did not use headsets, because the intercom on the left side was inoperative.

The clearance was given to the flight for a SAFFA 1 R departure, which allows climbing to 5000 ft (QNH). The takeoff was carried out at 07:53 LT on runway 28 with the flaps set at 15°. The commander (CDR) was pilot flying (PF).

After the takeoff the PF gave the following commands to the co-pilot (pilot not flying – PNF) in accordance with the cockpit voice recorder (CVR):

- Positive
- Gear
- Yaw damper
- NAV
- Flight level change
- One ***(sixty?)
- Altitude set

The PF commanded further:

- Flaps up

This order was disturbed by a received radio communication between an other aircraft and the tower St. Gallen-Altenrhein.

The pilot not flying (PNF) thought to have heard the order “flaps seven” and therefore selected the flaps to 7°. He read back to the PF “Flaps seven”. He was surprised by this command, but executed it without questioning it. The difference between the command and the read back was not detected by the PF.

After the flaps had been retracted from 14° to 7°, the aircraft accelerated from 160 KIAS to 178 KIAS due to the reduced drag.

After the initial selection of “flight level change” (FLCH) mode with a selected speed of 160 KIAS, the flight director switched at 07:53:56 to the “Alt Select” mode as the aircraft approached the selected altitude of 5000 ft. The aircraft accelerated from 178 KIAS to 207 KIAS.

At 07:54:01 LT the autopilot was engaged at an altitude of 4328 ft QNE.

At an altitude of 5076 ft QNE the PF actuated the pitch wheel and selected “basic vertical mode”.. In this mode the aircraft accelerated further from 207 KIAS to 250 KIAS.

The PNF did not react to the acceleration of the aircraft through the maximum flaps extended speed (V_{fe}) of 200 KIAS. During this time, the crew had to change frequency and to contact Zurich Arrival. The air traffic controller cleared them to FL 90 and gave them instructions to proceed to the Friedrichshafen beacon, which was a deviation from the SID. These instructions were not fully understood and read back by the PNF. After the correction by the controller; the PF stated to the controller, that these instructions were give to late with respect to the progress of the flight. The controller issued an instruction to fly a heading of 310° which the PNF read back.

Shortly thereafter the controller issued a new instruction to climb to FL 100. The PNF confirmed the instruction and the PF inserted the new input "Alt 100" and "flight level change" to the flight guidance system. The autopilot captured the actual speed of 249 KIAS in the mode "A/S Hold".

Thereafter, the PF ordered the after take off check. During this check the discrepancy of the flaps setting was discovered and the flaps were immediately retracted by the PF at a speed of 254 KIAS.

To compensate the nose-down effect at flaps during flaps extension, the aircraft Cessna CE 560XL is designed to change the angle of the stabilizer system from +1° to -2° if the flaps are moved away from the flaps up position. The flaps retraction produced the reverse action and the stabilizer started to move from the -2° position to the +1° position. This movement of the stabilizer forced the aircraft nose down and tried to reduce the pitch of the aircraft.

By exceeding the speed for the extended flaps, the set angle of the stabilizer produced a heavy pitch-up force which had to be counteracted by the autopilot. The automatic trim reached his "DOWN" end stop.

The retraction of the flaps and the simultaneous change of the angle of the stabilizer resulted in a high pitch down moment.

The aircraft pitched immediately nose down at a high rate. The PF pushed the autopilot disengage. Immediately he retarded the throttles and extended the speed brakes. During the descent a speed of 304,7 KIAS was reached at 5000 ft QNE. The maximum speed at this altitude is 260 KIAS. The flaps had been shortly extended again at 286 KIAS and retracted again at 296 KIAS. In accordance with the information of the PF he was able with help of the manual trim to recover the aircraft so that at 3288 ft QNE it was flying level again.

The crew decided to return to St. Gallen-Altenrhein for a precautionary landing.

The aircraft landed uneventful on runway 28. The passengers were normally disembarked. Nobody was hurt during the flight or the disembarkation of the plane.

The crew was instructed by the Head of the Swiss AAIB to pull the circuit breakers of the flight data recorder and the cockpit voice recorder before the ferry flight to Zurich. This instruction was not carried out.

Findings

- All crew members held licences issued by the Federal Office for Civil Aviation.
- The aircraft was admitted to traffic.
- The aircraft had no history of irregularities in the pitch channel of the autopilot.
- The LH audio panel was not working on intercom (IC).
- The crew did not use headphones.
- The aircraft was within applicable limits with regards to mass and balance.
- The commander (CDR) was pilot flying (PF) on this flight.
- For the take off, the Flaps were set to 15°.

- After lift off, the following commands were given by the PF:
 - Positive
 - Gear
 - Yaw damper
 - NAV
 - Flight level change
 - One *** (sixty?)
 - Altitude set
- The following words were partially overlaid by a radio communication between another aircraft and the tower:
 - Flaps up
- The co-pilot (PNF) read back: Flaps seven.
- The flaps were set to 7° by the PNF.
- At this moment the flight director was in "FLC" mode.
- At 07:53:56 LT the initial selection of the "FLC" mode switched to the "Alt" mode. The aircraft accelerated from 178 KIAS to 207 KIAS.
- At 07:54:01 LT the autopilot was engaged at an altitude of 4328 ft QNE.
- At 07:54:21 LT the PF actuated the pitchwheel and selected therefore the basic pitch mode. In this mode, the actual pitch angle is maintained and this mode corresponds to the "pitch hold" mode. This mode is not indicated in the mode selector. The pitch angle may be changed through the pitch wheel. In this mode the aircraft accelerated further from to 250 KIAS.
- At this speed the PF entered at 07:55:44 LT a new altitude and "FLC" mode.
- During the after take off check, the PF realized the flaps being still at 7°.
- The maximum permissible speed for a flaps setting of 7° is 200 KIAS.
- At 07:56:21 LT the flaps were selected up at a speed of 254 KIAS.
- At 07:56:28 LT at an altitude of 9184 ft QNE, the nose pitched over for a steep descent.
- The PF immediately disconnected the autopilot.
- The power levers have been retarded and the speed brakes extended.
- The speed during the dive reached 304.75 KIAS at an altitude of 5000 ft. QNE, a maximum rate of descent of 9600 ft/Min. (49 m/sec.) and a minimum pitch down angle of -19°.
- This maximum operating speed (V_{mo}) below 8000 ft. is 260 KIAS.
- During the dive, the flaps have been extended to 7° at a speed of 286 KIAS and retracted again at a speed of 296 KIAS.
- During the technical investigation the following units and systems were checked particularly: Autopilot, flight controls (stabilizer, control cables and trim system). No pre-existing defects have been found.

- The flight data recorder was recording the modes of the flight director. The labels used in the flight data recorder are different from the modes displayed on the mode selector. The different modes which are of interest for this case were listed in the table below:

<i>flightdirector mode</i>	<i>indication on mode selector</i>	<i>label on FDR</i>	<i>equivalent mode designation</i>	<i>remark</i>
<i>pitch hold</i>	<i>none</i>	<i>Pitch-Hol</i>	<i>pitch hold</i>	<i>basic mode</i>
<i>flight level change</i>	<i>FLC</i>	<i>ASHold</i>	<i>airspeed hold</i>	
<i>altitude select</i>	<i>ASEL</i>	<i>AltPresel</i>	<i>altitude preselect</i>	<i>during capture</i>
<i>altitude hold</i>	<i>ALT</i>	<i>AltHol</i>	<i>altitude hold</i>	

- During the investigation of the CVR through the equipment manufacturer it was established, that after the landing in St. Gallen Altenrhein, the "erase" button of the CVR had been pushed.
- General weather situation: during the night an occluded cold front has passed Switzerland and lies at the morning just east of Altenrhein. Behind the occlusion moist polar air is flowing from North West toward the Alps.

The weather at the airport St. Gallen-Altenrhein at 06:55 UTC:

Clouds : 3-4/8 Basis 4'500 ft AGL, 5-7/8 Basis 7'100 ft AGL
 Weather : light rain
 Visibility : around 10 km
 Wind : 250 °, 5 KTS
 Temp. / Dewp. : +06 °C/ + 02 °C
 Pressure : QNH 1007 hPa
 Hazards : -
 Sun : Azimuth 124°
 Angle +0° 26'

The weather had no influence on the incident.

Analysis

Technical aspects

In accordance with the signed checklist by the CDR a complete pre-flight check was carried out before the departure in Bern. No defects were stated except the intercom.

After the incident, the aircraft was submitted to a technical check with the support of the manufacturer. No damage to the aircraft was found.

Operational aspects

Due to the inoperative intercom, the crew did not use the headsets for their inter cockpit communication. Due to the ambient noise, there is an increased risk of misunderstanding during phases of high work load, if the crew is communicating without headsets. On the CVR it is clearly recognisable that the PF ordered "Flaps up" and the PNF replied with "Flaps seven". The fact, that the PNF, according his own statement, did not question the order of the PF despite his doubt about this order, may be assigned to the fact that the PNF had only modest experience in two man crew operation.

During the after take off check the PF detected that the flaps were still on 7° and he immediately selected them to up. Due to the changing stabilizer position there was a strong pitch moment. Due to the fact, that the autopilot had already trimmed fully nose heavy, the high forces from the moving stabilizer could not been counteracted. As a result, the aircraft nose pitched down at a high rate. The pilot disconnected the autopilot immediately. The speed increased quickly. The PF tried to recover the aircraft. Due to the high forces he was initially not able. The speed brakes were extended. Why the flaps were extended again at a speed of 286 KIAS and the retracted at 296 KIAS may only be explained by the high stress of the crew. The aircraft was then recovered by additionally using the manual trim.

The procedures applied during initial climb do not correspond with the published procedures (FP C56XL/Ver.2_06_2002_GM).

The available documents about the proficiency checks of both pilots did not show any negative remarks about their work as a two men crew.

The crew suspected a problem with the stabilizer and flew it visually back to St. Gallen-Altenrhein.

Cause

The incident was caused by a flaps retraction at a speed outside of the flaps operating envelope.

The following points have made the incident possible:

- Incomplete communication and insufficient surveillance of the crew (closed loop)
- Missing intervention of the PNF

Remark

The manufacturer, Cessna, has issued an alert service bulletin a few days after the incident, alerting all crew, that in case of a speed exceedance with flaps extended, the aircraft has to be slowed down below the relevant V_{fe} before retracting the flaps.

In February 2004 a mandatory service bulletin SB560XL-31-02 was issued. If the speed of 215 KIAS is exceeded and the flaps are moved, the change of the stabilizer angle is inhibited and a warning activated.

Berne, 24 September 2004

Aircraft Accident Investigation Bureau

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HB-VAA Incident 02. December 2002 CVR Transcript

Time	ITF	UTC	From	To	Text	Ch	Remark
0:00:00		6:52:00	TWR	SGF01	STAC zero zero one, no delay, we have your release, report passing two thousand five hundred feet climbing Wind two eight zero degrees two knots, runway two eight, cleared for take-off	2	
0:00:11		6:52:11	CM2	TWR	cleared for take-off two eight, next report passing two thousand five hundred feet, STAC zero zero one	2	
0:00:45		6:52:45	CM1	CM2	Ready ?	C	
0:00:46		6:52:46	CM2	CM1	Okay %%%%	C	
0:00:48		6:52:48					Noise of engine Spool-up
0:00:58		6:52:58	CM1	CM2	Take-off power is set	C	
0:01:00		6:53:00	CM2	CM1	Checked, Engine instruments checked	2	
0:01:09		6:53:09	CM2	CM1	Speed alive	2	
0:01:10		6:53:10	CM1	CM2	Checked	C	
0:01:13		6:53:13	CM1	CM2	No birds	C	
0:01:14		6:53:14	CM2	CM1	eighty	C	
0:01:15		6:53:15	CM2	CM1	V1, rotate	2	
0:01:22		6:53:22	CM1	CM2	Positive, Gear	C	
0:01:23		6:53:23	CM2	CM1	Gear	C	
0:01:24		6:53:24	CM1	CM2	Yaw Damper	2	
0:01:25		6:53:25	CM2	CM1	Yaw Damper	C	
0:01:26		6:53:26	CM1	CM2	NAV	C	
0:01:27		6:53:27	CM2	CM1	NAV	C	
0:01:28		6:53:28	CM1	CM2	Flight level change one %%%%	C	
0:01:31		6:53:31	CM2	CM1	one sixty, set	2	
0:01:39		6:53:39	586	TWR	(Tyrolean) five eight six yankee, please confirm our CTOT is zero eight zero four	2	overlapping with cockpit communication

CM1= Crewmember 1 (LH); CM2= Crewmember 2 (RH); F/A= Flight Attendant

TWR = St. Gallen Tower 118,65MHz; ARR= Zürich Arrival 119,92 MHz (ARFA); 586= Tyrolean 586Y; 001= SGF 001 (STAC001)

Ch= Channel; C= Cockpit Area Microphone % = unintelligible

transcript made by gec 04. Feb 2003;
revised by gec 25. Feb 2003

Time	ITF	UTC	From	To	Text	Ch	Remark
0:01:40		6:53:40	CM1	CM2	Altitude set, Flaps up	C	
0:01:43		6:53:43	CM2	CM1	Flaps seven	C	
0:01:45		6:53:45	TWR	001	STAC zero zero one contact Zurich arrival on one one niner decimal niner two, have a nice flight	2	
0:01:51		6:53:51	CM2	TWR	one one niner niner two, good bye STAC zero zero one	2	
0:01:55		6:53:55	TWR	586	Tyrolean five eight six yankee, Tower grüezi, for the time being the slot at zero eight zero four	2	
0:01:59		6:53:59	CM1	CM2	Altitude select	C	
0:02:01		6:54:01	CM2	CM1	Set		
0:02:03		6:54:03	CM1	CM2	Autopilot is on		"Piep" Sound of A/P
0:02:06		6:54:06	586	TWR	Okay, is copied thank you	2	
0:02:07		6:54:07	CM2	ARR	Swiss Radar good afternoon, STAC zero zero one passing four thousand five hundred feet	2	
0:02:12		6:54:12	ARR	001	STAC zero zero one calling ?	2	
0:02:14		6:54:14	CM2	ARR	Affirm, STAC zero zero one passing five thousand	2	
0:02:18		6:54:18	ARR	001	STAC zero zero one good morning identified, climb to flight level niner zero, proceed inbound Friedrichshaven then Trasadingen	2	
0:02:25		6:54:25	CM2	ARR	Stac zero zero one proceed Trasadingen flight level niner zero	2	
0:02:30		6:54:30	ARR	001	Initially towards Friedrichshafen, I call you back for the short-cut left to Trasadingen.	2	
0:02:35		6:54:35	CM1	ARR	STAC one we are already November approaching LAGOS in a SAFFA one romeo	2	
0:02:42		6:54:42	ARR	001	Continue to Friedrichshafen beacon I say this again Friedrichshafen beacon the Trasadingen this due to terminal traffic	2	
0:02:49		6:54:49	CM1	ARR	Friedrichshafen and please say again. the next time... a shorter time please	2	
0:03:03		6:55:03	ARR	001	zero zero one, you may fly heading three one zero	2	
0:03:07		6:55:07	CM2	ARR	Heading two (three) one zero STAC zero one	2	

CM1= Crewmember 1 (LH); CM2= Crewmember 2 (RH); F/A= Flight Attendant

TWR = St. Gallen Tower 118,65MHz; ARR= Zürich Arrival 119,92 MHz (ARFA); 586= Tyrolean 586Y; 001= SGF 001 (STAC001)

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Time	ITF	UTC	From	To	Text	Ch	Remark
0:03:15		6:55:15	CM1	CM2	A...(Expl.) .. so kurz nach dem take-off so nen (Expl.) .. ehrlich immer Zürich, mit Zürich hast du nur Probleme.	C	
0:03:22		6:55:22	CM2	CM1	Ja, ja	C	
0:03:33		6:55:33	CM1	CM2	Anti-ice is on	C	
0:03:34		6:55:34	ARR	001	STAC zero zero one climb flight level one hundred	2	
0:03:36		6:55:36	CM2	ARR	Climb flight level one hundred STAC zero zero one	2	
0:03:39		6:55:39	CM1	CM2	One hundred is set	C	
0:03:40		6:55:40	CM2	CM1	Checked	C	
0:04:02		6:56:02	CM1	CM2	After take-off check please	C	
0:04:04		6:56:04	CM2	CM1	Ja	2	
0:04:11		6:56:11	CM2	CM1	Altimeters	2	
0:04:12		6:56:12	CM1	CM2	one zero one three, eight three, top	C	
0:04:16		6:56:16	CM2	CM1	Checked	2	
0:04:17		6:56:17	CM2	CM1	Gear	2	
0:04:18		6:56:18	CM1	CM2	Up	C	
0:04:19		6:56:19	CM2	CM1	Flaps	2	
0:04:20		6:56:20	CM1	CM2	Flaps zero	C	
0:04:21		6:56:21	CM2	CM1	Ignition	2	
0:04:21		6:56:21	CM1	CM2	Au, seven	C	Noise of moving Flaps lever
0:04:22		6:56:22	CM2	CM1	Ah, seven	2	
0:04:28		6:56:28	CM2	CM1	Ignition	2	Noise of A/P disconnect.
0:04:33		6:56:33	CM1	CM2	On	C	
0:04:39		6:56:39	CM2	CM1	one hundred	2	
0:04:45		6:56:45	CM1	ARR	STAC one we have a problem	2	Overspeed Warning
0:04:49		6:56:49	CM2	CM1	Airbrakes	2	Overspeed Warning
0:04:50		6:56:50	CM1	CM2	Airbrakes are out	C	Overspeed Warning
0:04:51		6:56:51	CM2	CM1	Ja..		Overspeed Warning

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TWR = St. Gallen Tower 118,65MHz; ARR= Zürich Arrival 119,92 MHz (ARFA); 586= Tyrolean 586Y; 001= SGF 001 (STAC001)
Ch= Channel; C= Cockpit Area Microphone % = unintelligible

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Time	ITF	UTC	From	To	Text	Ch	Remark
0:04:54		6:56:54	ARR	001	STAC zero zero one, climb level one six zero now, own navigation Trasadingen, BELAR, BIRKI	2	Overspeed Warning
0:05:00		6:57:00	CM2	ARR	STAC one descend, emergency descend	2	Overspeed Warning
0:05:03		6:57:03	ARR	001	Did you copy ?	2	Overspeed Warning
0:05:05		6:57:05	CM1	CM2	No	C	Overspeed Warning
0:05:06		6:57:06	CM2	ARR	No, emergency descend ..eh.. STAC zero zero one	2	Overspeed Warning
0:05:12		6:57:12	ARR	001	Zero zero one turn right heading zero six zero; would you have vectors to Friedrichshaven	2	"Sink rate, sink rate" Overspeed Warning
0:05:16		6:57:16	CM2	ARR	Negative, VFR, VMC, no descend altitude	2	Overspeed Warning
0:05:23		6:57:23	ARR	001	Confirm ground contact	2	Overspeed Warning
0:05:24		6:57:24	CM1	CM2	Yeah	C	
0:05:26		6:57:26	CM2	ARR	Affirm	2	
0:05:27		6:57:27	CM1	CM2	We are climbing back again	C	
0:05:28		6:57:28	CM2	ARR	We climb back again to Altenrhein, STAC zero zero one	2	
0:05:30		6:57:30	ARR	001	zero zero one, roger, turn right heading one five zero towards Sankt Gallen.	2	Overspeed Warning
0:05:38		6:57:38	CM2	ARR	Negative	2	Overspeed Warning
0:05:39		6:57:39	CM1	CM2	Left heading	C	Overspeed Warning
0:05:41		6:57:41	CM2	ARR	Left heading direct to Altenrhein STAC zero zero one	2	Overspeed Warning
0:05:44		6:57:44	ARR	001	Okay left then	2	Overspeed Warning
0:05:48		6:57:48	CM2	ARR	And contact now Altenrhein	2	Overspeed Warning
0:05:50		6:57:50	ARR	001	one one eight six five. do you need assistance?	2	Overspeed Warning "Bank angle, bank angle"
0:05:55		6:57:55	CM2	TWR	Altenrhein, good morning again, request landing as soon as possible	2	
0:06:00		6:58:00	CM2	CM1	Whats the problem ?	2	
0:06:05		6:58:05	CM1	F/A	Monique, tell %%% we go back to %%% we have a problem with the stabilo	C	Overspeed Warning
0:06:15		6:58:15	CM2	TWR	Altenrhein, STAC zero zero one	2	Overspeed Warning

CM1= Crewmember 1 (LH); CM2= Crewmember 2 (RH); F/A= Flight Attendant

TWR = St. Gallen Tower 118,65MHz; ARR= Zürich Arrival 119,92 MHz (ARFA); 586= Tyrolean 586Y; 001= SGF 001 (STAC001)

Ch= Channel; C= Cockpit Area Microphone % = unintelligible

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0:06:24		6:58:24	CM2	TWR	Altenrhein Sankt Gallen STAC zero zero one	2	
0:06:30		6:58:30	TWR	001	STAC zero zero one Sankt Gallen Tower, read you loud and clear	2	
0:06:33		6:58:33	CM2	TWR	Yeah..Standby. eeh. .Sankt Gallen Tower ..request direct to.. for landing; at five thousand now	2	
0:06:41		6:58:41	TWR	001	STAC zero zero one, Roger, continue straight in runway one zero, tailwind three knots, cleared to land runway one zero	2	
0:06:47		6:58:47	CM2	TWR	Cleared to land runway one zero STAC zero zero one	2	
0:06:55		6:58:55	CM2	CM1	zero niner.....okay	C	
0:07:20		6:59:20	CM2	CM1	das ist für eeh... stabilo..mit..eeeh..	C	
0:07:24		6:59:24	CM1	CM2	und frag für runway two eight ...stabilo wahrscheinlich nicht geht	C	F/A in background
0:07:32		6:59:32	CM2	CM1	Ja, ja	2	
0:07:37		6:59:37	CM2	CM1	Before Landing	2	
0:07:55		6:59:55	CM2	CM1	Descend check, altimeters okay one zero one seven	2	
0:08:05		7:00:05	CM1	TWR	STAC zero zero one, can you inform Zürich about this happening. We have a problem with the stabilizer, we got automatically during the flight to the landing position and we have to descend and we recovered the plane in about .. at % (four??) thousand five hundred feet	2	Overspeed warning
0:08:27		7:00:27	TWR	001	STAC zero zero one, that's copied, will do	2	
0:08:29		7:00:29	CM1	TWR	And I come to runway two eight due to wind may be the stabilizer doesn't work	2	
0:08:32		7:00:32	TWR	001	Well the surface wind presently two five zero degrees, up to two knots, so you have the option one zero or two eight, what ever you prefer, (sir)	2	
0:08:40		7:00:40	CM1	TWR	I prefer the two eight	2	
0:08:43		7:00:43	TWR	001	Okay cleared to land runway two eight	2	
0:08:44		7:00:44	CM1	TWR	Thank you	2	
0:08:46		7:00:46	CM2	CM1	Okay approach %%	C	
0:08:47		7:00:47	TWR	001	And sir if you prefer mmh..to remain eeh..airborne for a while, I could arrange eeh..some rescue	2	

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Ch= Channel; C= Cockpit Area Microphone % = unintelligible

transcript made by gec 04. Feb 2003;
revised by gec 25. Feb 2003

Time	ITF	UTC	From	To	Text	Ch	Remark
0:08:54		7:00:54	CM1	TWR	I have to check first and that will be a number can you call the driver for the pax on board that we have	2	
0:09:02		7:01:02	CM1	CM2	Gibst du die Telefon Nummer	C	
0:09:03		7:01:03	CM2	CM1	Ja	C	„Minimums, minimums“
0:09:05		7:01:05	TWR	001	STAC zero zero one please say again	2	
0:09:08		7:01:08	CM1	TWR	Standby a minute	2	
0:09:10		7:01:10	CM2	CM1	Was willst du?	2	
0:09:14		7:01:14	CM1	CM2	Okay Flaps seven	C	
0:09:15		7:01:15	CM2	CM1	Flaps seven	2	
0:09:16		7:01:16	CM1	CM2	Brakes	C	
0:09:18		7:01:18	CM2	CM1	Brakes	2	
0:09:19		7:01:19	CM1	CM2	%%%	C	
0:09:20		7:01:20	CM2	CM1	Speed ??	C	
0:09:21		7:01:21	CM1	CM2	Gear down	C	
0:09:23		7:01:23	CM2	CM1	Speed checked, Ja, gear down	2	High Noise level covers most of CAM Channels signal **
0:09:29		7:01:29	CM1	CM2	%%%	C	**
0:09:29		7:01:29	CM2	CM1	Ja	2	
0:09:36		7:01:36	CM2	CM1	Three greens	2	
0:09:37		7:01:37	CM2	CM1	Airbrakes (??stowed)	2	
0:09:43		7:01:43	CM2	CM1	%%Pressurisation%%	2	semisilent checklist work of CM2
0:09:50		7:01:50	CM1	CM2	Flaps fifteen	C	**
0:09:52		7:01:52	CM2	CM1	Flaps fifteen, right side is clear	2	
0:09:58		7:01:58	CM2	CM1	Before landing check completed except full flaps	2	
0:10:00		7:02:00	CM1	CM2	Ja	C	
0:10:05		7:02:05	CM2	CM1	and speed okay	2	

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Time	ITF	UTC	From	To	Text	Ch	Remark
0:10:13		7:02:13	CM1	CM2	Okay, full flaps	C	
0:10:14		7:02:14	CM2	CM1	Full Flaps set	2	
0:10:16		7:02:16	CM1	CM2	%%Stabilo ist wieder %%	C	**
0:10:17		7:02:17	CM2	CM1	Ja	2	
0:10:19		7:02:19				2	"Minimums, Minimums"
0:10:36		7:02:36	CM2	TWR	STAC zero zero one on short final two eight	2	
0:10:37		7:02:37	CM1	CM2	Before landing checklist	C	** plus covered by ATC communication
0:10:40		7:02:40	TWR	001	two two zero degrees two knots cleared to land	2	"five hundred"
0:10:45		7:02:45	CM2	TWR	Cleared to land STAC zero zero one	2	
0:10:47		7:02:47	CM2	CM1	Three greens, full flaps	2	
0:10:57		7:02:57	CM1	CM2	%%	C	**
0:11:00		7:03:00	CM2	CM1	ja	2	
0:11:03		7:03:03	CM1	CM2	%%	C	**
0:11:15		7:03:15	CM2	CM1	We approach V_{ref} plus five	2	
0:11:19		7:03:19	CM1	CM2	Airbrakes	C	
0:11:21		7:03:21	CM2	CM1	Airbrakes set	2	Noise of decelerating A/C on GND
0:11:30		7:03:30	CM2	CM1	sixty	2	

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Appendix 2



