

# Status Report

## Identification

Type of Occurrence:	Accident
Date:	1 March 2012
Location:	Egelsbach
Aircraft:	Transport aircraft
Manufacturer / Model:	Cessna / Citation 750
Injuries to Persons:	Five persons fatally injured
Damage:	Airplane destroyed
Other Damage:	Damage to forests
Information Source:	Investigation by BFU
State File Number:	BFU CX005-12

## Factual Information

### History of the Flight

On 1 March, the Cessna Citation 750 was on a business trip in Austria from Innsbruck via Salzburg to Linz. At 1816 hrs<sup>1</sup> the airplane took off in Linz with two pilots and three passengers aboard; destination airport was to be Bratislava, Czech Republic. On the way to Bratislava a stopover in Egelsbach, Germany (EDFE) was planned; an additional passenger would board there.

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<sup>1</sup> All times local, unless otherwise stated.

For the flight from Linz to Egelsbach a Y-flight plan was filed; it scheduled a flight according to Instrument Flight Rules (IFR) including an approach according to Visual Flight Rules (VFR).

At 1824 hrs the airplane reached German airspace. The radio communication recorded by the air traffic service provider showed that the Cessna Citation 750 crew made the initial call to Langen Radar at 1836:54 hrs on frequency 120.575 MHz. At 1839:10 hrs the air traffic controller cleared a descent to Flight Level (FL) 140 after the identification of the airplane. Initially, the crew did not understand the instruction to fly a left turn toward SPESSART NDB and then later toward CHARLIE VOR. The Pilot in Command (PIC) apologised and let the controller know that he did not come here very often. At 1843:58 hrs a descent to 5,000 ft was instructed and the barometric air pressure QNH of 1,025 hPa passed. After "high speed approved" given by the controller the Citation 750 was passed on to Frankfurt Approach Control (136.125 MHz).

At 1845:00 hrs the PIC made the initial call to Frankfurt Approach Control. He said he was in descent to 5,000 ft and did have the weather for Frankfurt. The controller issued a clearance for a visual approach at night (VFR Night) to Frankfurt-Egelsbach Airfield and asked him to report "Egelsbach in sight". The co-pilot acknowledged the clearance and that he would report "field in sight". The controller asked for a confirmation by the crew that it was indeed a VFR Night flight. About one minute later the controller asked the pilot if the IFR part had already been cancelled. The copilot answered "negative". The controller apologised and said it was his fault and he should continue his flight to CHARLIE. The controller added: "Disregard the VFR Night".

The crew made contact with the destination airport with VHF 2. The Aviation Supervision Office at Frankfurt-Egelsbach told the PIC that he could choose his landing direction. The crew received the information that runway 27 was easier to approach and that YANKEE ZWO was a good approach point.

Afterwards the co-pilot said: "... we're proceeding direct to Egelsbach and we have just been talking to them we will take runway two seven for four miles final." The controller advised of the "YANKEE inbound routing"; the pilot acknowledged with the reference that they were not yet flying VFR. The controller's information "ja however you may proceed YANKEE ONE" was read back by the pilot with "YANKEE ONE".

The read-out of the Cockpit Voice Recorder (CFR) indicates that the crew had entered reporting point ECHO into the Flight Management System (FMS).

The crew asked for a descent clearance to 4,000 ft which was granted at 1850:59 hrs. At 1851:36 hrs a descent for 3,000 ft was cleared. The pilot acknowledged the clearance with "...descend three thousand"; the controller answered: "...direct YANKEE ZWO für die zwei sieben" (direct YANKEE ZWO for the two seven).

After a further descent clearance to 2,500 ft, the controller asked at 1853:58 hrs if the pilot could cancel the IFR part. The co-pilot answered "affirmative". The controller confirmed the change from IFR to VFR with the time indication of 17:54 UTC. He added that the pilot should continue his descent to 1,500 ft or lower for the VFR Night flight and report airfield in sight. The pilot acknowledged that he would report back once he had the airfield in sight.

Afterwards the PIC ordered "Flaps five" which the co-pilot acknowledged with "Speed check. Flaps five selected". According to the radar recording the airplane passed reporting point ECHO at 1854:42 hrs. The airplane passed YANKEE ONE to the south with a distance of 1.2 Nautical Miles (NM).

The read-out of the Flight Data Recorder (FDR) data showed the airplane was in 2,800 ft AMSL at that time. The ground speed was about 285 kt with a rate of descent of 600 ft/min.

Ten seconds after the PIC said "Okay. Let's slow it down" the flaps were set to 15° and the landing gear was extended. At that time the airplane was in about 1,770 ft AMSL with a brief rate of descent of 2,500 ft/min.

At 1855:05 hrs the controller reported "..., field now eleven clock position, range six miles." The co-pilot answered that he had the airfield in sight after he had gotten the PIC's assurance.

The airplane turned left to a heading of about 265°. At that time the rate of descent was about 600 ft/min and speed decreased further with 1 kt/s. At 18 55:16 hrs the last radio communication with Frankfurt Approach Control was "... approved to leave any time ..." which the co-pilot acknowledged.

The co-pilot established radio contact with the Flugleiter of Egelsbach Airfield where he was asked to report airfield in sight. According to the recorded communication be-

tween crew and Frankfurt-Egelsbach Info the runway lighting including the strobe lights were activated.

The FDR recorded that at 1855:32 hrs the altitude select of the auto flight system was changed from 1,500 ft to 1,160 ft AMSL.

The radar data showed that the on-request reporting point YANKEE TWO was passed at 1855:37 hrs in 1,530 ft AMSL with an airspeed of 175 kt. Based on the determined data the airplane was in about 820 ft AGL. At 1855:56 hrs the preselected altitude was reduced to 580 ft.

The co-pilot's comment "...thousand feet above" answered the PIC with "... and three miles to go only". At 1856:06 hrs the radio altimeter reported "Five hundred". The rate of descent was now 1,200 ft/min and increased in the following ten seconds up to 2,500 ft/min. The flaps drove from 15° to 35°.

Two seconds after the radio altimeter the Enhanced Ground Proximity Warning System (EGPWS) generated the announcement "Sink rate, pull up, pull up, pull up, ...". Seven seconds after the beginning of the EGPWS warning the co-pilot said: "That's five ....three hundred feet". At 1856:08 hrs the EGPWS announced "...sink rate, too low, terrain, sink rate, terrain." The PIC asked "Terrain?" which the co-pilot answered with "Terrain!!!". At that moment an elevator deflection of up to 17° nose up occurred. The pitch increased from -4° to +20° within two seconds.

At 1856:22 hrs the airplane collided with trees one second before the airplane reached the maximum pitch. At the time the autopilot was engaged. The engine parameter N1 (engine thrust) remained at 34% for both engines until the end of the recording.

In the further course of the accident individual parts of the airplane were torn off by contact with trees. About 430 m after the initial tree contact the airplane impacted the ground. Prior to the impact the airplane had inverted itself. About 25 m prior to the ground impact both wings were torn-off by trees. The accident site was about 3.6 km (1.96 NM) from the threshold of runway 27 of Frankfurt-Egelsbach Airfield.

The airplane was destroyed by impact forces and ensuing fire. Both pilots and the three passengers sustained fatal injuries.

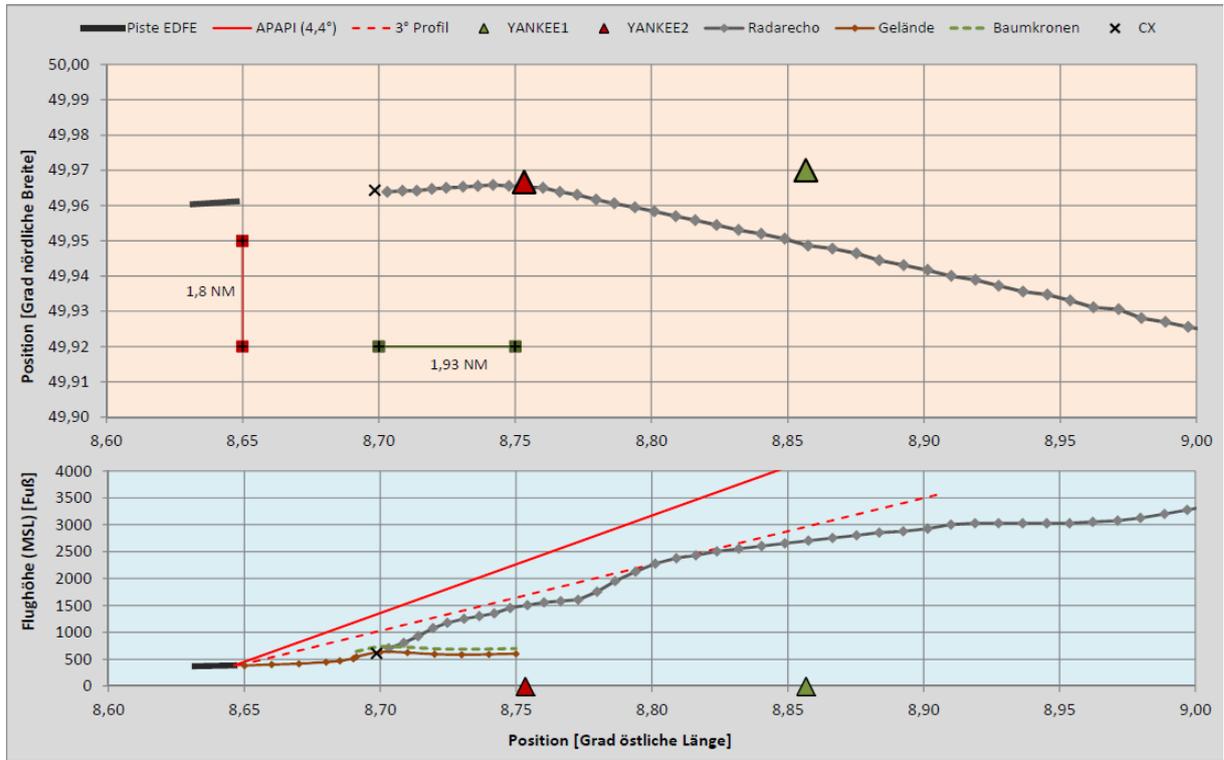


Image 1: Flight path reconstruction based on radar data, FDR and geographical data

Source: BFU

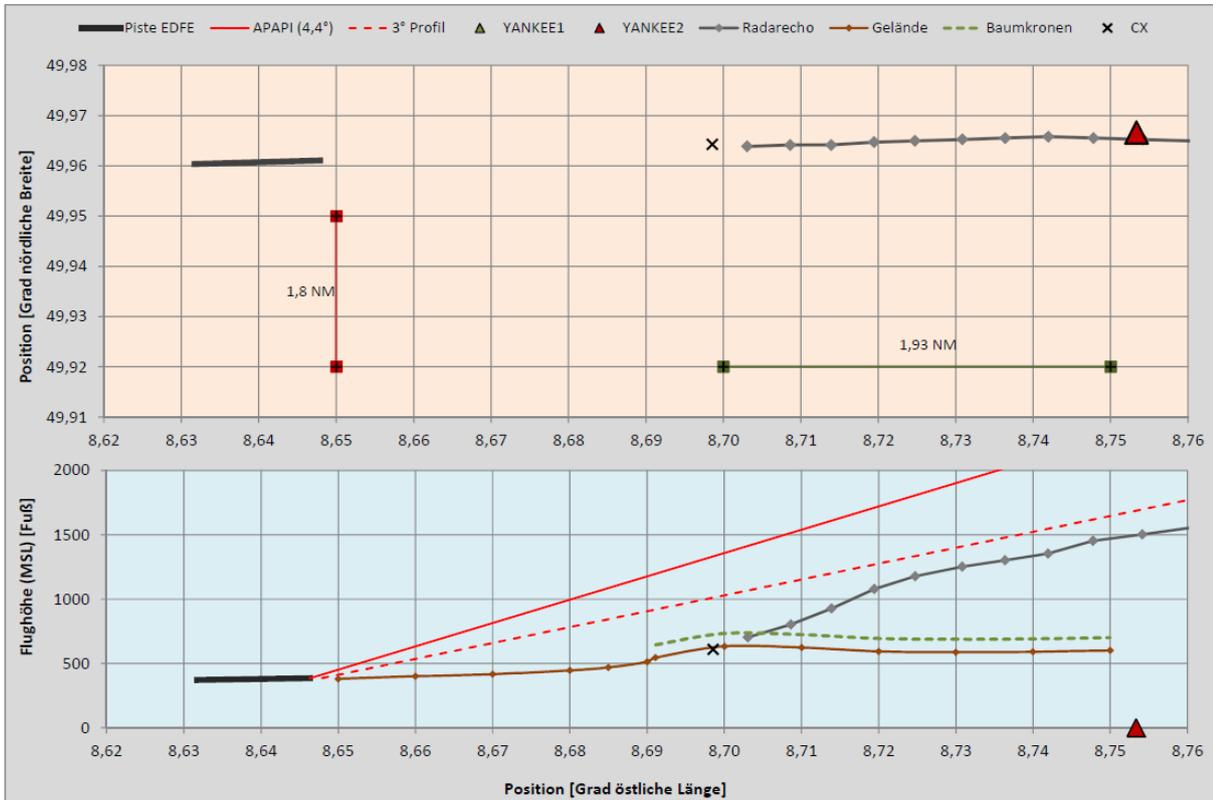


Image 2: Flight path reconstruction based on radar data and geographical data

Source: BFU

## 1.2 Injuries to Persons

Injuries	Crew	Passengers	Third Party
Fatal	2	3	-
Serious	-	-	-
Minor / None	-	-	-

## Personnel Information

### Pilot in Command (PIC)

The 52-year-old Pilot in Command (PIC) was a German citizen. He held an Air Transport Pilot's Licence (ATPL) initially issued by the American Federal Aviation Administration (FAA) on 6 June 2003.

The licence included the following ratings and type ratings: Airplane Multi Engine Land, Airplane Single Engine Land and Airplane Single Engine Sea; CE-525S, CE-560XL, CE-680, CE-750, CE-525 and CE-560XL.

He also held a Private Pilot's License (PPL) with the ratings Airplane Multi Engine Land, Airplane Single Engine Land and Instrument Airplane which had been issued by the FAA on the basis of a German PPL.

His Class I Medical Certificate had been issued on 19 January 2011 with the restriction to wear glasses.

At his last medical he had given his flying experience with 4,580 hours. According to his pilot log book he had flown: 65 flights with 124 hours 42 minutes in the last 90 days, 3 hours and five minutes in the last 72 hours, 34 minutes in the last 24 hours on the CE-750.

The PIC had completed an initial course and two recurrent courses PIC at a US flight training institution qualified for Cessna Citation 750.

The PIC was owner and director of the operator which operated the airplane as business jet.

## Co-pilot

The 41-year-old co-pilot was an American citizen. He held an Air Transport Pilot's Licence (ATPL) issued by the FAA on 22 December 2011.

The licence included the following ratings and type ratings: Airplane Multi Engine Land, Airplane Single Engine Land and Airplane Single Engine Sea; CE-500, CE-750, G-1159, G-IV and G-V. His Class II Medical Certificate had been issued on 9 January 2012 with the restriction to wear glasses.

At his last medical he had given his flying experience with 3,000 hours. According to his pilot log book he had flown: 16 flights with 21 hours in the last 90 days, 3 hours and five minutes in the last 72 hours, 34 minutes in the last 24 hours on the CE-750.

The co-pilot had completed an initial course at a US flight training institution qualified for Cessna Citation 750.

He was employed as pilot by the operator and was operations manager for the Cessna.

## First Controller

The 24-year old controller held an Air Traffic Control Licence issued by the Federal Supervisory Authority for Air Navigation Services in accordance with ICAO guidelines. He had the ratings as arrival and area controller including Flight Information Service (FIS). For the control centre Langen the ratings Arrival Planner North, Departure Controller North, Departure Planner North/South, Arrival Controller North, Feeder North and Departure Controller South were entered and valid.

The controller had his license since March 2011.

He was working as radar controller and responsible for his work station. At 1848 hrs he left his work station and had handed over the control of the Cessna Citation 750 to another controller.

## Second Controller

The 32-year old controller held an Air Traffic Control Licence issued by the Federal Supervisory Authority for Air Navigation Services in accordance with ICAO guidelines. He had the ratings as arrival and area controller including Flight Information

Service (FIS). For the control centre Langen, the ratings Arrival Controller North, Feeder North, Arrival Planner South/North, Departure Controller North, Departure Planner North/South, Arrival Controller High, Arrival Planner North, Arrival Controller South, Feeder South and Departure Controller South were entered and valid.

He had his licence since March 2005.

At 1848 hrs as radar controller, he had taken over control of the Cessna Citation 750.

## Aircraft Information

The Cessna Citation 750 (Citation X) is a twin-engine business jet with swept wings and conventional tail. It is certified for up to 12 passenger seats.

The type certificate was issued in accordance with U.S. 14 CFR, Part 25 of the Federal Aviation Administration (FAA). It meets the requirements for day and night operations, VFR and IFR flights, flights in CAT II conditions (Part 91) and in Reduced Vertical Separation Minimum (RVSM) airspace.

The accident airplane was registered in the United States of America and operated as business jet by a Hong Kong based company for their business trips.

## Aircraft Data

Manufacturer:	Cessna Aircraft Company
Type:	Citation 750 (Citation X)
FAA Type Certification Data Sheet:	T00007WI
Manufacturer's Serial Number (MSN):	750-0219
Year of manufacture:	2003
Maximum allowable take-off mass:	16,375 kg / 36,100 lbs
Maximum fuel capacity (all tanks):	5,897 kg (13,000 lbs)
Crew:	Two (pilot and co-pilot)
State of Registry:	USA
Certificate of registration:	Issued on 27 June 2008 Valid to 31 June 2014

Airworthiness certificate:	Valid
Engine manufacturer:	Rolls-Royce
Engine type:	AE 3007C1
Manufacturer's Serial No Engine No 1:	330459
Manufacturer's Serial No Engine No 2:	330458
APU manufacturer:	Honeywell
APU type:	150 CX
Manufacturer's Serial No APU:	P 324
Total flight time:	3,377 Flight hours (16 February 2012)
Total flight cycles:	2,223

## Speeds

Maximum allowable airspeed:

(Limit Speeds)

V<sub>MO</sub> at Sea Level to 8,000 ft (2,438 m)..... 270 KIAS (500 km/h)

V<sub>MO</sub> at 8,000 ft (2,438 m) to 30,650 ft (9,342 m) .....350 KIAS (649 km/h)

M<sub>MO</sub> at 30,650 ft (9,342 m) to 51,000 ft (15,545 m) .....M 0.92 (indicated)

Maximum speed with extended flaps:

(Flap Extension Speeds)

V<sub>FE</sub> at Takeoff and Approach (5° flaps) ..... 250 KIAS (463 km/h)

V<sub>FE</sub> (15° flaps) ..... 210 KIAS (389 km/h)

V<sub>FE</sub> at Landing Extension (full flaps).....180 KIAS (333 km/h)

Maximum speed with extended landing gear and for the extension of the landing gear: (Landing Gear Operating and Extended Speed)

V<sub>LE</sub> .....210 KIAS (389 km/h)  
 V<sub>LO</sub> .....210 KIAS (389 km/h)

### Automatic Flight Control System (AFCS)

The Cessna Citation 750 Operations Manual described the Automatic Flight Control System as follows:

The AFCS consists of the system components

- Autopilot (AP)
- Yaw Damper (YD)
- Flight Director (FD)

Selection and handling of the system functions occurs through the Flight Guidance Controller (FGC). The selected modes are displayed on the Primary Flight Display (PFD) and the FGC.

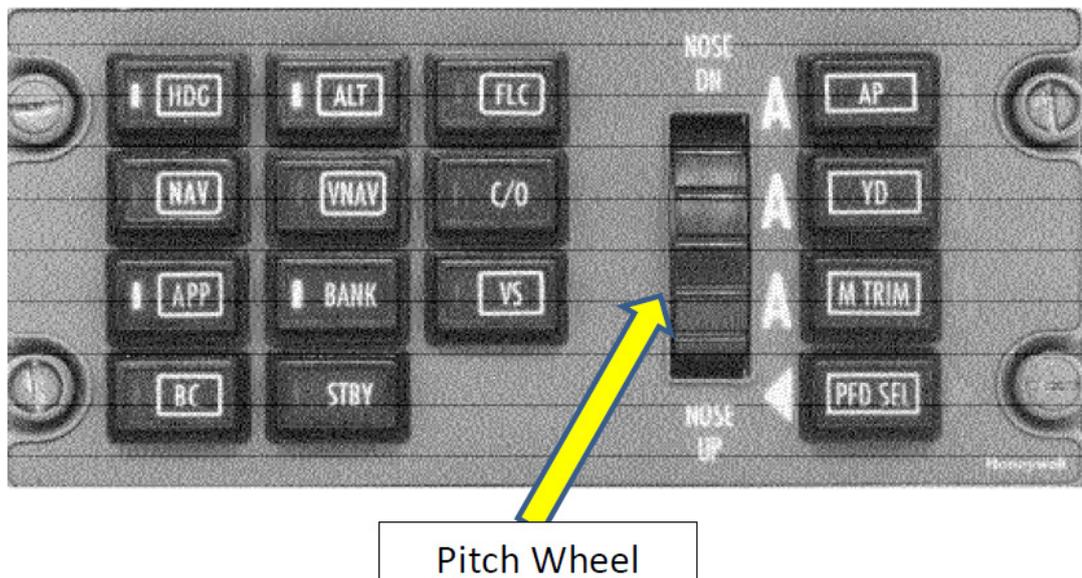


Image 3: Control panel for the Auto Flight Control System

Source: AFM Citation 750

## Flight Director (FD)

The Flight Director has the following functions:

- HDG (heading)
- NAV (Navigation)
- APP (Approach)
- BC (Back Course)
- ALT (Altitude Hold)
- VNAV (Vertical Navigation, conduct of flight through FMS)
- BANK
- STBY (Deactivation of all FD Modes, AP remains)
- FLC (Flight Level Change)
- C/O (Changeover)
- VS (Vertical Speed)

With the Pitch Wheel a speed target for the rate of climb or descent can be selected. Is Flight Level Change (FLC) or Vertical Speed (V/S) selected the airplane's pitch changes to meet the selected target.

In the ground mode of the autopilot (pitch and roll hold) the pitch can be controlled on the Pitch Wheel.

Altitude Preselect Mode together with the Vertical Mode can be used to reach and maintain a preselected altitude. The altitude can be preselected with the Altitude Select Knob.

An acoustic signal sounds when the pre-selected altitude is reached.

## Enhanced Ground Proximity Warning System

The airplane was equipped with an Enhanced Ground Proximity Warning System (EGPWS).

The EGPWS is a warning system to avoid ground proximity. The airplane's position the GPS determines is compared with the terrain data of the internal data base. The EGPWS determines the distance to the ground surface:

- to the front
- below
- to both sides

Depending on the danger situation the system generates instructions with a synthetic voice like "Sink rate", "Pull up", ...

## Checklists

Cessna had in cooperation with Flight Safety International issued a Pilots' Abbreviated Checklist for the aircraft type. These included:

Approach checklist:

## APPROACH

1. Landing Data ..... **CONFIRM**
  - a. Airspeed ..... **V<sub>APP</sub>/V<sub>REF</sub>**
  - b. Landing Distance

### SIMPLIFIED CRITERIA - FLAPS FULL LANDING

Conditions for use: Runway Length  $\geq$  4500', Dry Runway, No Tailwind, 0 to  $\pm$  2% Gradient, Anti-Ice Off, PA  $\leq$  2000', and Temperature  $\leq$  45° C.

	WEIGHT – POUNDS					
	22,000	24,000	26,000	28,000	30,000	31,800
V <sub>REF</sub> – KIAS	108	110	115	121	126	132
V <sub>APP</sub> – KIAS	112	116	121	126	131	136

2. Crew Briefing ..... **COMPLETE**
3. Avionics/Flight Instruments ..... **CHECK/SET**
4. Minimums ..... **SET** (RA/BARO)
5. FUEL CROSSFEED Switch ..... **OFF**
6. Exterior Lights ..... **AS REQUIRED**
7. Flaps/Slats ..... **AS REQUIRED**
8. Passengers ..... **BRIEF**
9. Seats/Seat Belts/Shoulder Harnesses/  
Aft Divider Sliding Doors ..... **CHECK/SECURE/LATCHED OPEN**  
(if belted toilet seat occupied)
10. Passenger Advisory Lights ..... **PASS SAFETY**
11. LH/RH IGNITION Switches ..... **NORM**
12. Pressurization ..... **ZERO DIF** (at touchdown)
13. ENG SYNC Knob ..... **OFF**

Pre-landing checklist:

## BEFORE LANDING

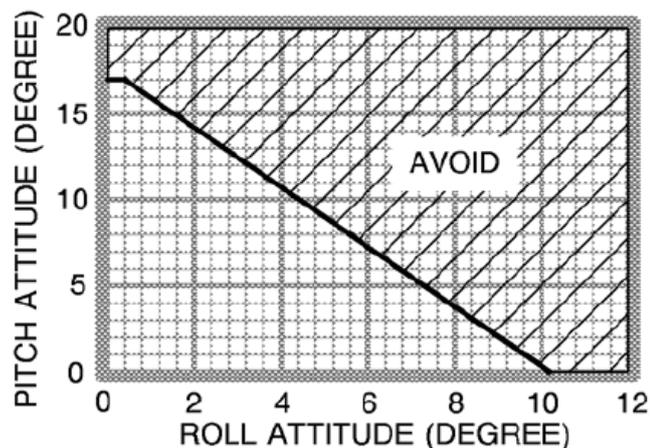
1. Landing Gear .....DOWN/LOCKED 3 GREEN LTS
2. Flaps .....AS REQUIRED
3. Speed Brakes.....RETRACTED (0%)
4. EICAS.....CHECK
5. Airspeed.....V<sub>REF</sub>
6. Autopilot (above minimum use height) .....OFF

Landing checklist:

## LANDING

1. Throttles .....IDLE
2. Speed Brakes.....EXTEND AT TOUCHDOWN (100%)
3. Elevator Control .....FORWARD PRESSURE AT TOUCHDOWN
4. Brakes.....APPLY after nose wheel ground contact
5. Thrust Reversers .....DEPLOY after nose wheel ground contact
6. Thrust Reversers .....IDLE BY 65 KIAS

### WING TIP/TAILCONE GROUND CONTACT ROLL-PITCH ENVELOPE



## Meteorological Information

The BFU has asked the Deutscher Wetterdienst (German meteorological service provider) to provide an expert opinion on the weather situation at Frankfurt-Egelsbach Airfield for the time of the accident.

### Weather situation

On 1 March 2012 the weather situation in the Rhine-Main area was dominated by a high pressure area which reached from Great Britain across Germany to the Balkan. An advection of mild and stably layered air occurred. Below a sinking inversion a damp layer with upper limits at about 2,000 ft AMSL lasted the whole day. A layer of fog and low stratus had formed in the Rhine-Main area which, compared to the vicinity, dispersed only slowly and in some areas not at all.

### Ground Visibility and Cloud Base

The weather expert opinion calculated the cloud base with 540 ft at the accident site. This result was justified with the fact that the weather reporting station in Egelsbach has an elevation of about 380 ft AMSL. The accident site has an elevation of about 640 ft AMSL; this results in a difference of 260 ft. Based on a cloud base of 2/8 in 800 ft AGL in Egelsbach the cloud base for the accident site would have been 540 ft AGL.

According to the expert opinion the cloud base was more or less diffuse and not very often distinct. In a transition zone between 200 and 300 ft below the clouds, visibility could be limited to such an extent that ground visibility was hazy or the horizon invisible.

On 17:20 UTC the last METAR was compiled at Egelsbach Airfield. The weather observations in Egelsbach take place from sunrise minus 30 minutes until sunset plus 30 minutes.

### Meteorological Pre-flight Preparation

The DWD stated that on the day of the incident, the following meteorological data was available for meteorological pre-flight preparation:

The following aviation routine weather report (METAR) and terminal aerodrome forecast (TAF) were valid in Linz prior to departure:

METAR 1520 EDFE 03005KT 7000 BKN007 10/09 Q1025 A3027 1011 2985

METAR 1550 EDFE 03005KT 8000 SCT008 10/08 Q1025 A3027 1011 2985

METAR 1620 EDFE 36005KT 8000 FEW008 10/08 Q1025 A3027 1011 2985

This means that on 1 March 2012 the following weather conditions were observed at Frankfurt-Egelsbach Airfield:

	1620 hrs	1650 hrs	1720 hrs
Wind velocity:	30° / 5 kt	30° / 5 kt	30° / 5 kt
Ground Visibility:	7,000 m	8,000 m	8,000 m
Clouds:	5-7/8 in 700 ft	3-4/8 in 800 ft	1-2/8 in 800 ft
Temperature:	10 °C	10 °C	10 °C
Dewpoint:	8 °C	8 °C	8 °C
QNH:	1,025 hPa	1,025 hPa	1,025 hPa

Terminal Aerodrome Forecast (TAF):

TAF AMD EDDF 011506Z 0116/0218 05004KT 9000 BKN007 BECMG 0116/0117  
SCT007 BECMG 0200/0203 4000 BR BKN012 TEMPO 0203/0208 0400 FG

This means that on 1 March 2012 at 1250 hrs the following forecast was issued as AMD for Frankfurt Main Airport:

Period of validity: 1 March 16:00 UTC until 2 March 18:00 UTC

Wind: 50°, 4 kt

Visibility: 9,000 m ground visibility

Clouds: 5-7/8 in 700 ft

Change: between 16:00 UTC and 17:00 UTC

Clouds: 3-4/8

Change: between 00:00 UTC and 03:00 UTC on 2 March:

Visibility: 4,000 m; 5-7/8 in 1200 ft

Trend: Temporary fog between 03:00 UTC and 08:00 UTC on 2 March

Furthermore, a satellite image, a Low Level Significant Weather Chart and an area forecast for low level flights (GAMET) were available for meteorological pre-flight preparation.

The Significant Weather Charts (SWC) did not show any significant weather phenomena for the flight. The Low Level SWC forecast a basic condition for AREA B of 4,000 m visibility and 5-7/8 cloud cover with lower limits in 1,000 ft and upper limits of 2,500 ft. The forecast predicted local fog development.

### Meteorological Pre-flight Preparation by Service Provider

A company specialising in pre-flight preparation prepared the flight in the scope of their service contract with the operator. This included the meteorological pre-flight preparation.

For the four legs scheduled for 1 March the following information gathered at 0917 hrs included METAR, TAF, LONG TAF and SIGMET. The following weather information was indicated for Frankfurt-Egelsbach Airfield:

Flight group apt EDFE - QEF - EGELSBACH RWY 09 27

SA 010750Z 05004KT 3000 BR SCT003 BKN005 08/08 Q1025=

This means that on 1 March 2012 at 07:50 UTC the following weather conditions were observed at Frankfurt-Egelsbach Airfield:

Wind: 50°, 4 kt

Ground Visibility: 3,000 m

Visibility restriction: mist

Clouds: 3-4/8 in 300 ft

Temperature and Dewpoint: 8 °C

QNH: 1,025 hPa

Furthermore, the following weather charts were added:

WIND/TEMPERATURE FL 100, PROGNOSTIC CHART VALID 0930 UTC 01 MAR 2012

WIND/TEMPERATURE FL 300, PROGNOSTIC CHART VALID 1700 UTC 01 MAR 2012

WIND/TEMPERATURE FL 340, PROGNOSTIC CHART, VALID 1810 UTC 01 MAR 2012

VERTICAL CROSS SECTION ALONG THE ROUTE, LOWL – EDFE, WIND, TEMPERATURE, TROPOPAUSE, ICING AND TURBULENCE FORECAST

SIGNIFICANT WEATHER, FIXED TIME PROGNOSTIC CHART, ROUTE LOWL – EDFE, FL 100-450, VALID 1800 UTC 01 MAR 2012

All other weather information related to other destination or alternate aerodromes.

### Weather Data Compilation at Egelsbach Airfield

During the day, aviation supervisor officers, who are also weather observers trained and appointed by the DWD, collected weather data at Frankfurt-Egelsbach Airfield. The technically measured data was published as METAR.

At night, no official weather was determined. At request, the aviation supervision office gave unofficial weather estimations to pilots.

The METAR issued by Frankfurt-Egelsbach Airfield:

The aviation routine weather report (METAR) of 1850 hrs valid at the time of the accident did not contain any visibility information. The METAR of 1820 hrs reported a visibility of 4 km in mist and a cloud base of 800 ft (few clouds).

METAR Egelsbach of 1850 hrs:

```
SA 01/03/2012 17:50-> METAR EDFE 011750Z AUTO 03003KT //// // /// 08/07  
Q1025=
```

METAR Egelsbach of 1920 hrs:

SA 01/03/2012 18:20->METAR EDFE 011820Z AUTO 06002KT ///  
R27/P2000N // /// 08/08 Q1025=

### Meteorological Information during the Flight

No weather data was published on the Automatic Terminal Information Service (ATIS) for Frankfurt-Egelsbach Airfield. The ATIS for Frankfurt Main Airport was available. At 1842 hrs the Cessna Citation 750 crew listened to ATIS L.

Frankfurt Main Airport published the following ATIS:

```
-ARR-ATIS EDDF K METAR 011650  
-EXPECT INDEPENDENT PARALLEL ILS APCH RWY 07R AND RWY 07L  
-RWY 07L 07R  
-ATTN , TAXIWAY R11 IS CLSD  
-TRL 60  
-03006KT  
-8000  
-SCT005  
-T09 DP09  
-QNH1025 QFE1012  
-TREND NOSIG
```

```
-ARR-ATIS EDDF L METAR 011720  
-EXPECT INDEPENDENT PARALLEL ILS APCH RWY 07R AND RWY 07L  
-RWY 07L 07R  
-ATTN , TAXIWAY R11 IS CLSD  
-TRL 60  
-01005KT  
-8000  
-FEW004  
-T08 DP08  
-QNH1025 QFE1012  
-TREND NOSIG
```

This means that for Frankfurt Main Airport a cloud cover of 3-4/8 in 500 ft (ATIS K) and 1-2/8 in 400 ft (ATIS L) was indicated.

### Weather Information by Witnesses

Aviation supervision officers stated that ground visibility was more than 3 km at the time of the approach. Witnesses stated that visibility had deteriorated significantly after the accident.

Other witnesses stated that the weather situation had grown worse in the larger Rhine-Main area after the accident. The crew of a police helicopter home-based at Egelsbach Airfield reported that the search mission for the accident site had to be aborted about 15 minutes after the accident due to poor visibility.

## Aids to Navigation

For the VFR airfield Frankfurt-Egelsbach visual approach charts and procedure descriptions were published. An Abbreviated Precision Approach Path Indicator (APAPI) was available.

Furthermore, a Non-Directional Beacon (NDB) was available.

## Communication

There were radio communications between the airplane and Langen Radar and Frankfurt-Egelsbach Tower. Radio communications were recorded and made available to the BFU for this investigation.

## Aerodrome information

Frankfurt-Egelsbach Airfield is located in the Rhine-Main area south-east of Frankfurt Main Airport in the triangle of the cities Frankfurt/Main, Offenbach and Darmstadt.

For approaches and landings in accordance with VFR two runways oriented 085° and 265° are available. The asphalt runway is 1,400 m long and 25 m wide. The second runway is a grass strip of 670 m. Airfield elevation is 385 ft AMSL.

The airfield has an Abbreviated Precision Approach Path Indicator (APAPI) as glidepath indicator system. For the approach to runway 27 an approach glideslope of 4.4° is selected.

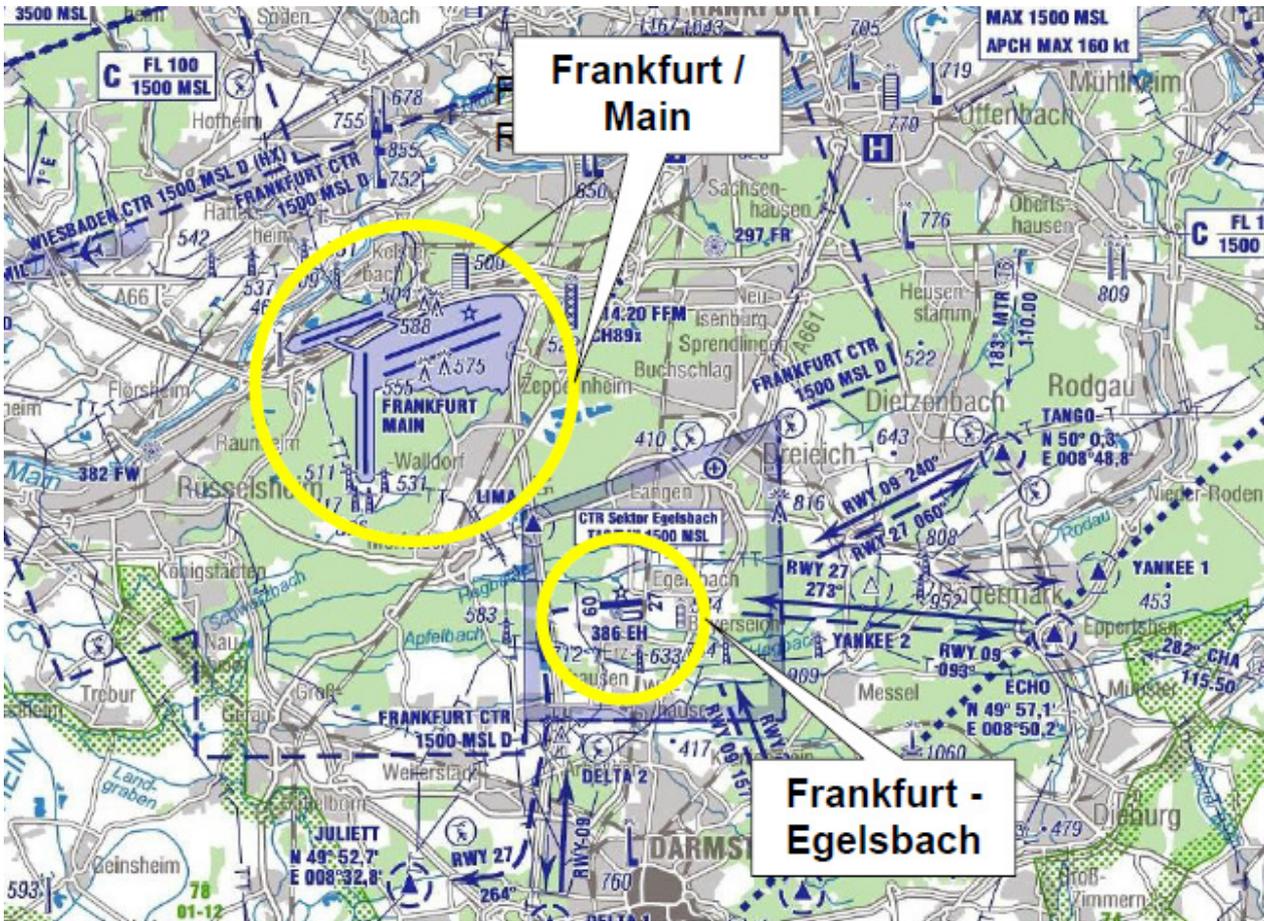


Image 4: Geographical location of Frankfurt-Egelsbach Airfield

Source: AIP/BFU

For the landing of the Cessna Citation 750 runway 27 was in operation. The Landing Distance Available (LDA) was 1,166 m.

The runway threshold lights were activated as were the runway edge lighting right and left of the threshold and a strobe light each.

The airfield operator stated that in 2011 a total of 71,957 flight operations took place at the airfield; 1,292 of which with aircraft with a total take-off mass of more than 5.7 t. About 3,100 (estimated) of which in the category of the so-called High Performance Aircraft (HPA). The number of VFR Night flights was about 2,439.

According to the stipulations of the approval and supervision authority for the airfield a HPA is an aircraft with the following characteristics:

1. all jets
2. all aircraft with more than 4 t MTOM (except helicopter).

## Flight Recorders

### Cockpit Voice Recorder

The aircraft was equipped with an L-3COM Cockpit Voice Recorder (CVR); P/N 2100-1020-02, S/N 204084.

On the outside, the CVR showed small traces of influences of heat. The data memory was not damaged and could be read out.

The CVR had four channels which recorded conversations via the headset and sounds and acoustic warnings via the area mic of the last 30 and 120 minutes, respectively. The conversations the crew had had were available in good quality and on separate channels.

By means of time markings the CVR recordings were synchronised with other recordings such as FDR or radar traces. According to which the CVR recording stopped at 1856:27 hrs.

### Flight data recorder

The aircraft was equipped with a Honeywell Flight Data recorder (FDR); P/N 980-4700-025, S/N 08935.

As with the CVR, the FDR also only showed small traces of heat influence. The data memory was not damaged and could be read out.

The FDR recorded 150 parameters.

## Wreckage and Impact Information

The accident site was located about 3.6 km (1.96 NM) east of Egelsbach prior to runway 27. The wreckage was about 100 m north of the extended centre line in a deciduous forest directly at a crossroads. On a length of about 100 m in flight direction toward the accident site the crowns of the trees were torn off. Based on the torn-off tree crowns it was determined that the flight path slanted by about 15° in this section.



Image 5: Accident site and Frankfurt-Egelsbach Airfield

Photo: BFU

The first damaged tree crowns were found about 430 m prior to the main wreckage. There parts of the landing gear doors, the flaps and the slats were found. About 110 m behind this point, parts of the wing structure and composite fan-guide-vanes of the engine were found. Even one day after the accident there was still fuel smell to be noticed.

Immediately in front of the crossroads, towards the west, impact traces on two tree trunks were found. By the tree standing to the left - in flight direction - parts of the right wing (about 2 m long) were found; by the right tree parts of the left wing (about 1 m long) were found. The impact traces on the left tree - in flight direction - had an angle of 20°.

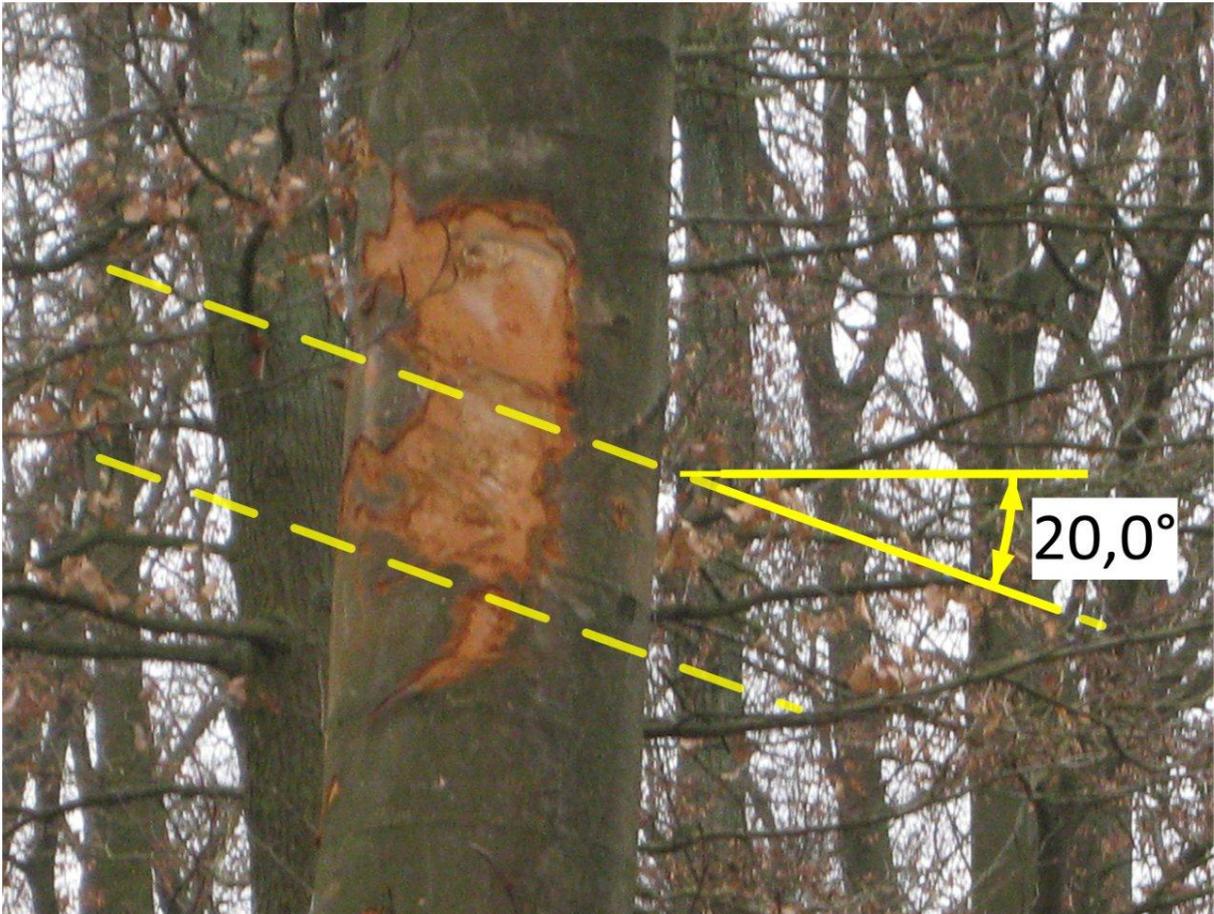


Image 4: Impact traces on a tree about 20 m prior to the main wreckage

Photo: BFU

A few meters prior to the path an impact crater of about 0.75 m depth was found; in its vicinity lay parts of the elevator and of the right wing.

On the path the tip of the vertical tail was found whose leading edge was destroyed. Immediately behind it, west of the path, the torn-off elevator and the wing centre section, both lying on their upper surfaces, were found. The wing centre section was severely damaged by fire. The actuators of the main landing gear were extended.

The aft part of the fuselage lay on its right side and was partially destroyed by fire. The upper fuselage shell was melted up to its middle fuselage panels. The front part of the fuselage and the cockpit were no longer connected. Parts of the controls (pedals and engine controller) were found in a crater directly in front of the aft fuselage. Other parts (control horn, seats) lay scattered in flight direction beyond the fuselage. The engine control levers were in flight idle, the flaps and slats were extended and the speed brake lever was on full extended.

The fuselage fuel tank was found about 15 m from the fuselage. It showed heavy signs of fire. The nose landing gear had been severed in two parts and was found west of the main wreckage.

Due to the destruction, the operation of the controls could not be tested. The upper and lower rudders were still connected to the vertical tail. The complete right elevator and the inner left elevator were still attached to the horizontal stabiliser. Different parts of the aileron were scattered across the accident site.

The flaps were severed from the wing parts still identifiable. The spindles for the flaps were in the extended position. The slots on at least two flap tracks showed dents. The rods were in the end position "Extended".

The spoilers (roll spoiler, speed brakes) were partially still attached to the wings. Due to the mechanical destruction and the fire damage the position of the spoilers at the time of the accident could not be determined.

A reference pressure of 1,024 hPa was selected on the mechanical stand-by altimeter. The stand-by HSI showed about 282°.

Both engines were torn off. The left engine lay directly next to the main wreckage. The fan blades showed impact traces and carried parts of the aircraft structure. In the engine pieces of branches with sharp edges were found. Soil was embedded in the upper half of the fans. The upper half of the inlet duct was severely dented.



Photos 5 and 6: Right and left engine

Photo: BFU

## Fire

There were several places of fire at the accident site. There were no traces of fire on the parts which had been damaged and torn off at the initial tree contact. One source of fire was the place where the left wing collided with the tree (shortly before the impact). Others were in the area of the front fuselage, the right engine and the fuselage tank.

The magnesium front frame of the right engine was totally burnt.

## Organisations and their Procedures

The Regierungspräsidium Darmstadt (regional council), the approval and oversight authority for Frankfurt-Egelsbach Airfield, had published in the Nachrichten für Luftfahrer (NfL) (German Language Publication for Aviation) I-179/08 of 17 July 2008 procedures for flight operations at night.

The Federal Supervisory Authority for Air Navigation Services (BAF) had stipulated the arrival and departure procedures on 21 October 2012 in the NfL I-212/10. Among other things, the YANKEE reporting points for HP-aircraft were established. With the NfL I-251/10 the BAF has stipulated procedures for VFR Day flights from and to Frankfurt-Egelsbach Airfield within the CTR Frankfurt.

On 16 December 2010 the BAF published NfL I-212/11 which contained announcements for the issuance of clearances and flight procedures for flights to and from Frankfurt-Egelsbach Airfield during the day within the CTR Frankfurt, Sector Egelsbach. The NfL 251/10 contained further stipulations.

The stipulated procedures were published in the Luftfahrthandbuch Deutschland (Aeronautical Information Publication, AIP).

On 6 March 2003 the aerodrome operator and the responsible air traffic service provider signed a written agreement concerning the operational procedure.

## Approach and Departure Procedure

Flights from and to Frankfurt-Egelsbach Airfield during the day took place in the CTR Frankfurt Main Airport, sector Egelsbach. Clearances for this sector for VFR flights are rated as given if certain conditions are met. Among other conditions, a ground and flight visibility of 3 km and a main cloud base of 1,000 ft AGL have to be given.

These conditions and corresponding procedures were published in the NfL I-251/10 and the AIP.

The CTR zone Frankfurt, sector Egelsbach was not active during the night. Langen Radar strictly issues clearances for approaching aircraft in the controlled airspace for the compulsory reporting points valid for day operation (according to the visual approach chart day). These reporting points are the clearance limits for VFR Night flights in the controlled airspace with landing intention in Frankfurt-Egelsbach. Pilots are required to leave the controlled airspace at the latest 7 NM before reaching Frankfurt-Egelsbach either of their own volition or on demand. The frequency change to Egelsbach Info can only occur once Langen Radar has said so.

There were special procedures and charts for approaches with jets and all aircraft with 4,000 kg MTOM or more (except helicopters). These so-called High Performance Aircraft (HPA) had to use the approach and departure routes along the compulsory and on-request reporting points YANKEE ONE and YANKEE TWO and DELTA ONE and DELTA TWO, respectively. There was a difference between HPA Day and HPA Night.

In addition to the procedural descriptions for VFR Day and VFR Night, six different visual approach charts were published in the AIP.

The AIP differentiated between the stipulations and procedures for VFR Day and VFR Night. There was a separate VFR Night chart for HPA approaches.

The traffic circuit ran between the motorways A5 and A661. Since aerodrome elevation was 385 ft AMSL the traffic circuit was in 1,300 ft AMSL.

The VFR approach and departure procedures to and from Frankfurt-Egelsbach Airfield published in the AIP were described by the following procedural descriptions and charts:

- Procedural description VFR Day
- Procedural description VFR Night
- Visual approach chart VFR Day

- Visual approach chart VFR Day in detail with traffic circuit
- Visual approach chart HPA Day
- Visual approach chart HPA Day in detail with traffic circuit
- Visual approach chart VFR Night (two charts with different scales)
- Aerodrome chart

For the approach of the Cessna Citation 750 the following routing was valid:

After the change of flight rules from IFR to VFR, from compulsory reporting point YANKEE 1 to YANKEE 2 (on-request reporting point) to the final approach of runway 27.

At night the conditions of airspace Golf were in force for the airspace around Egelsbach. VMC minima were given with 1.5 km and free of clouds.

The aerodrome chart gave an approach angle of 4.4° to the APAPI.

## Additional Information

### Change of Flight Rules Procedures

For the approach and the landing a change of flight rules from IFR to VFR was required for the Cessna Citation coming from Linz, Austria, and flying to Egelsbach. The change of flight rules occurred at 1754 hrs. That is why a Y-flight plan had been filed.

The Manual of Operations for the Air Traffic Control Service (BA-FVK), Section 443.1 stipulated the procedures for the change of flight rules from IFR to VFR for approaches to airports which can only be reached by VFR.

The following conditions were valid:

- For approaches to airports below the controlled airspace and airports for which there is no IFR approach procedure published, a descent clearance where a change of flight rules from IFR to VFR occurs can only be given up to the stipulated IFR minimum cruising altitude or to the Minimum Radar Vector Altitude (MRVA).

- If air traffic allows, a cancellation is to be agreed to if a pilot intends to cancel the IFR part of his flight plan to continue on VFR.
- No direct or indirect request to the pilot should be made to change from IFR to VFR flight.
- The following reduced weather minima apply within the controlled airspace for the continued VFR flight below the IFR minimum cruising level or the MRVA:
  - flight visibility 3000 m;
  - visual contact to the ground;
  - clear of clouds.
- Requirement for the application of these minima:
  - The change from IFR to VFR does take place in the IFR minimum cruising altitude or MRVA;
  - The controlled airspace is left immediately after the change to VFR flight.
- Until the aircraft has left the controlled airspace it has to be separated from other controlled flights requiring separation.
- The pilot shall be instructed to report leaving the controlled airspace.
- If applicable, the pilot can be instructed to establish contact on the appropriate FIS frequency.

#### Additional Accident:

On 7 December 2009 an accident occurred during approach to Frankfurt-Egelsbach Airfield involving a Beechcraft King Air F90; the pilot and two passengers were fatally injured. The accident site was about 50 m from the accident site of the Cessna Citation 750.

The weather situation was almost identical and so were the vertical profiles once YANKEE TWO had been passed. In both cases, the approach angle was at about 3° up until the last section.

On 12 October 2011 the BFU has issued a Final Report (State File Number: 3X178-09) on the investigation of the King Air F90 accident.

## Safety Recommendation

On 19 March 2012 the German Federal Bureau of Aircraft Accident Investigation has issued the following safety recommendations as immediate measures and to prevent future accidents:

Recommendation no.: 11/2012

The Regierungspräsidium Darmstadt (regional council), the approval and oversight authority for Frankfurt-Egelsbach Airfield, should suspend the approval to conduct flights according to Visual Flight Rules Night (VFRN) for so-called High Performance Aircraft until the safety recommendations No 12/2012, 13/2012 and 14/2012 have been implemented

Note: This recommendation has been (partially) implemented by the Regierungspräsidium Darmstadt.

Recommendation no.: 12/2012

The Regierungspräsidium Darmstadt (regional council) should revise the procedures for the conduct of flights according to Visual Flight Rules (VFR) to and from Frankfurt-Egelsbach Airfield in cooperation and coordination with the Deutsche Flugsicherung GmbH (German air traffic service provider, DFS) and the Bundesaufsichtsamt für Flugsicherung (Federal Supervisory Authority for Air Navigation Services, BAF). The description of the procedures should be simple, comprehensible and free of contradictions and should be published in the AIP.

This is also true for the visual approach charts.

Recommendation no.: 13/2012

In the scope of the process planning the Deutsche Flugsicherungs GmbH (German air traffic service provider, DFS) originally determined the definition of the so-called High Performance Aircraft (HPA). The definition should be amended by the speed parameter  $V_{ref}$ .

It should be ensured that the stipulated approach and departure routes for the airfield including the traffic circuit can be safely flown with the Vref value determined in the definition with so-called High Performance Aircraft.

Recommendation no.: 14/2012

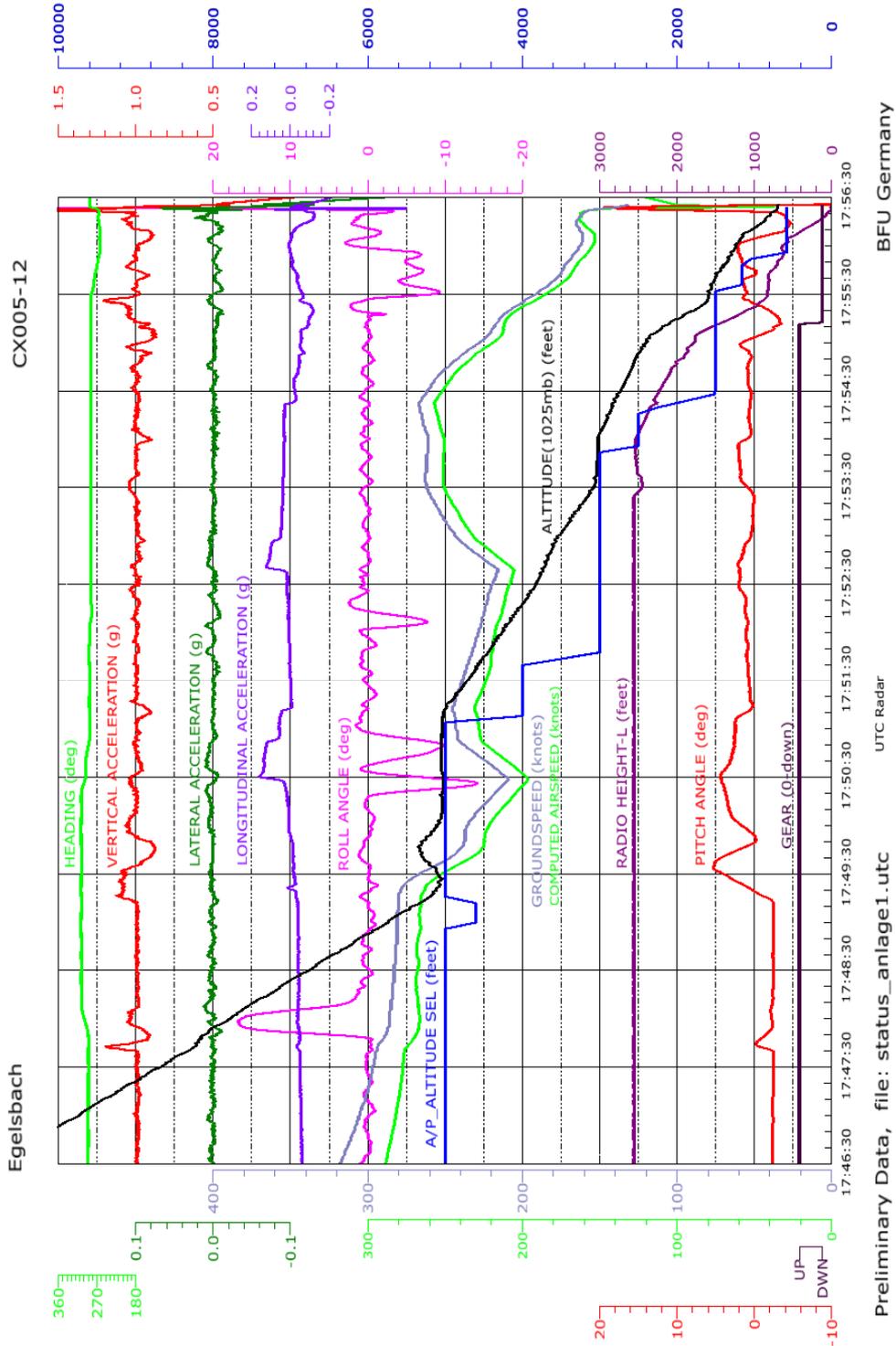
In the visual approach chart for Frankfurt-Egelsbach Airfield it should be clearly visible that due to the obstacle situation the final approach has to be flown with an approach angle of 4.4°. In the approach charts the wooded hill range east of the airfield should be depicted as an obstacle.

Investigator in charge: Johann Reuss

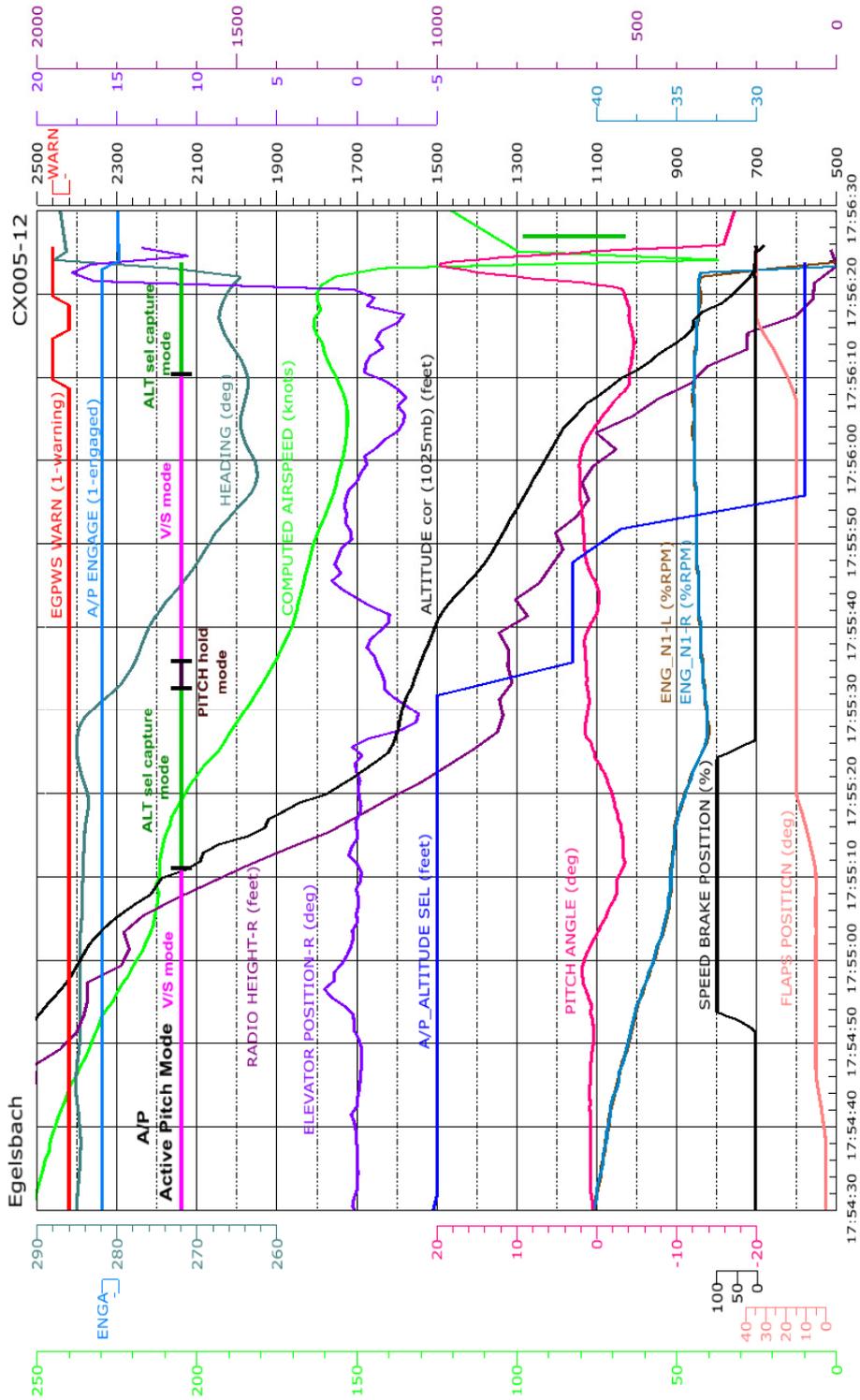
## Appendices

- Appendix 1 FDR flight parameters; recording time 1846 hrs to 1856 hrs
- Appendix 2 FDR flight parameters; recording time 1854 hrs to 1856 hrs
- Appendix 3 Wreckage distribution at the accident site
- Appendix 4 Dimensions Cessna Citation 750
- Appendix 5 Published descriptions of the approach procedures (a to d)
- Appendix 6 Visual Approach Chart Day
- Appendix 7 Visual approach chart VFR Day in detail with traffic circuit
- Approach 8 Visual approach chart HPA Day
- Appendix 9 Visual approach chart HPA Day in detail with traffic circuit
- Approach 10 Visual approach chart VFR Day
- Appendix 11 Aerodrome chart

Appendix 1



Appendix 2



BFU Germany

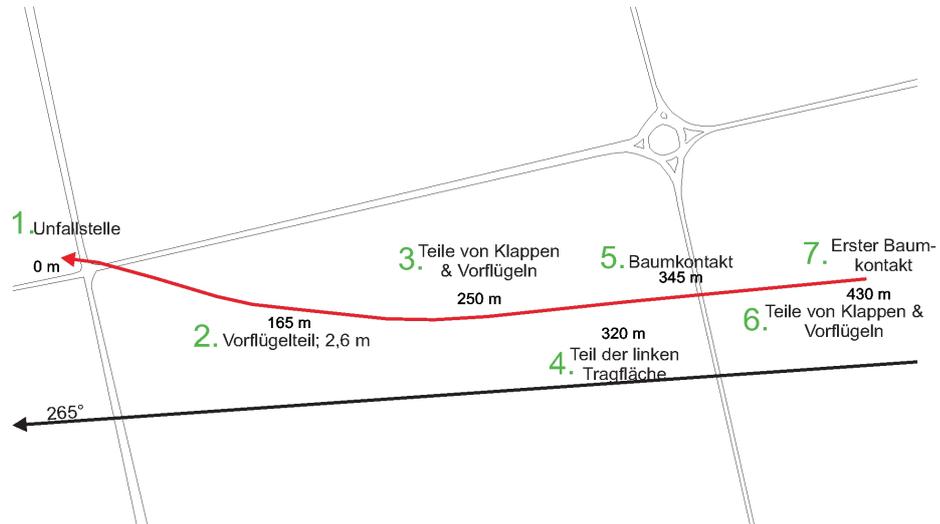
UTC Radar

Preliminary Data, file: status\_anlage2

Created: April 18, 2012

Revised: April 25, 2012

Appendix 3



<p>1.</p>	<p>Unfallstelle Richtung 281°</p>	<p>4.</p>	<p>Teil der linken Tragfläche 320 m zur Unfallstelle</p>
<p>2.</p>	<p>2,6m langes Vorflügelteil 165 m zur Unfallstelle</p>	<p>5.</p>	<p>Baumkontakt Teile der Vorflügel und Klappen gefunden 345 m zur Unfallstelle</p>
<p>3.</p>	<p>Teil eines Vorflügels im Baum und Klappenteile am Boden 250 m zur Unfallstelle</p>	<p>6.</p>	<p>Teile von Vorflügeln und Klappen nach dem ersten Baumkontakt 430 m zur Unfallstelle</p>

Wreckage distribution at the accident site

Drawing / Photos: BFU

Appendix 4

SECTION I  
DESCRIPTION AND SPECIFICATIONS

MODEL 750

THREE VIEW DRAWING

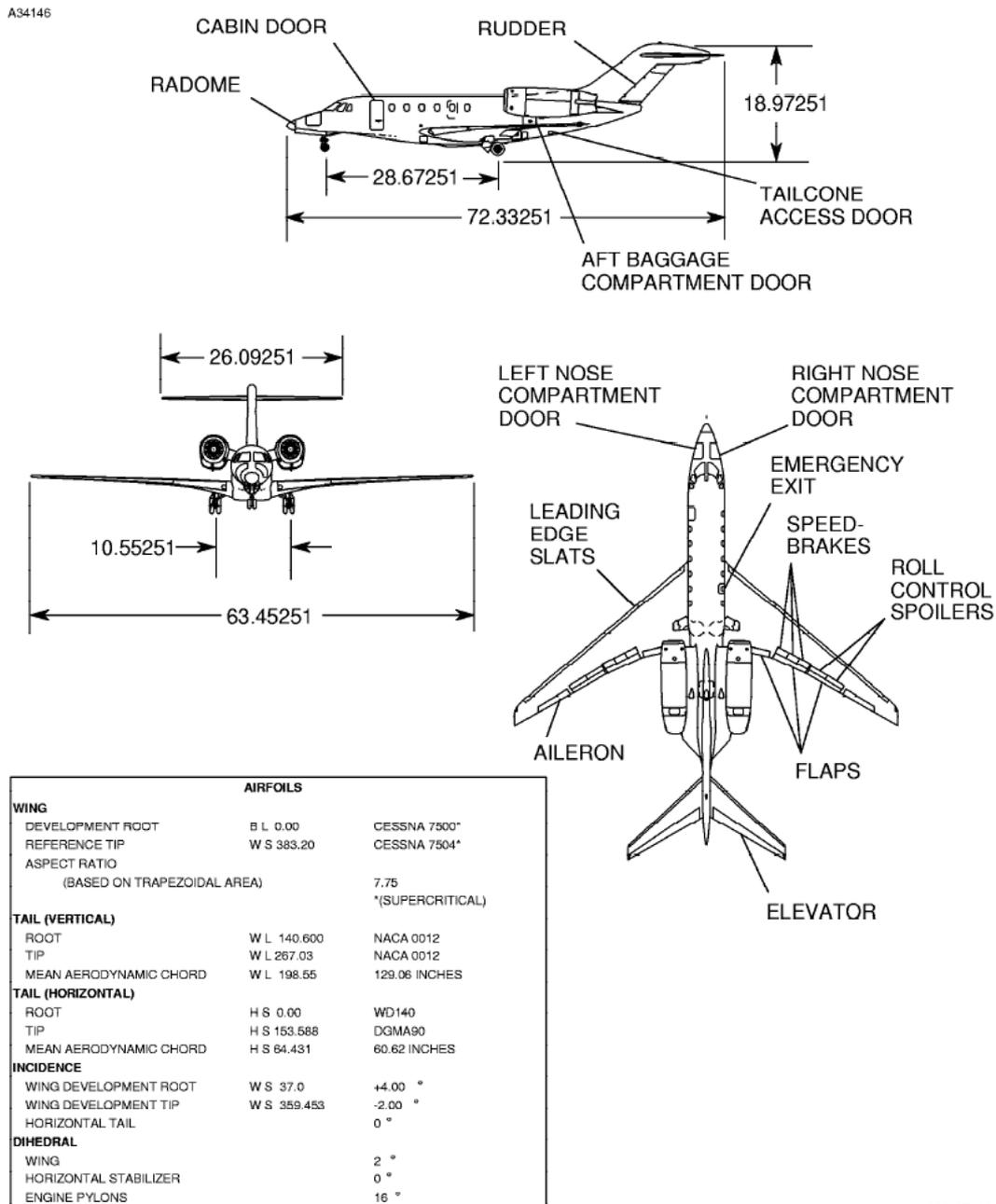


Figure 1-2

A6710T1003

## Appendix 5a

**FRANKFURT-EGELSBACH  
EDFE**
**VFR TAG**

(NfL I-212/11)

**1. Freigaben für Frankfurt CTR, Sektor Egelsbach**

1.1 Der Sektor Egelsbach dient der Sicherheit von Abflügen nach Instrumentenflugregeln von der Startbahn 18 des Flughafens Frankfurt. Ein- und Ausflüge sind deshalb ausschließlich entlang der unter den Punkten 4. Anflüge und 6. Abflüge beschriebenen Verfahren durchzuführen. Sofern nicht anders von der Flugplatzkontrollstelle Frankfurt bestimmt, gilt für folgende VFR-Flüge die Freigabe für den betreffenden Kontrollsektor als erteilt:

- a) Abflüge
- b) Flüge für die Platzrunde sowie Flüge für Übungs- und Schulplatzrunden, einschließlich damit verbundener Abflüge
- c) Anflüge

1.2 Für VFR-Flüge im betreffenden Kontrollzonensektor müssen Luftfahrzeuge mit einem betriebsbereiten Transponder ausgerüstet sein (Abfragemodus A/C, 4096 Antwortcodes). Die Flugplatzkontrollstelle Frankfurt kann Ausnahmen zulassen.

**Hinweise**

Am Verkehrslandeplatz Frankfurt-Egelsbach wird kein Flugverkehrskontrolldienst, sondern Flugplatzinformationsdienst durchgeführt („Egelsbach Info“). Die Zusammenarbeit zwischen der Flugplatzkontrollstelle Frankfurt und Frankfurt-Egelsbach wird entsprechend geregelt.

**2. VMC-Mindestwerte**

Innerhalb der Kontrollzone Frankfurt, Sektor Egelsbach, gelten für VFR-Flüge folgende Mindestwerte:

- Flug- und Bodensicht: 3 km
- Hauptwolkenuntergrenze: 1000 ft

Das Bundesministerium für Verkehr, Bau- und Stadtentwicklung hat diese Werte nach § 28 Abs. 3 LuftVO festgelegt.

**3. Pflichtmeldepunkte**

Folgende Pflichtmeldepunkte werden festgelegt:

- a) TANGO (▲): Östlich von Dietzenbach,
- b) ECHO (▲): Nördlich von Eppertshausen,
- c) KILO (▲): Östlich von Darmstadt,
- d) DELTA 1 (▲): AB-Abfahrt Darmstadt,
- e) JULIETT (▲): Nördlich von Griesheim / westlich von Weiterstadt.

**VFR DAY**

(NfL I-212/11)

**1. Clearances for Frankfurt CTR, Sektor Egelsbach**

1.1 Sector Egelsbach serves to ensure the safety of IFR departures from RWY 18 of Frankfurt Airport. Entries and exits, therefore, shall be conducted exclusively in accordance with the procedures described in Para 4. „Approaches“ and Para 6. „Departures“. Unless determined otherwise by Frankfurt aerodrome control tower, clearance for the control sector concerned is considered to be granted for the following VFR flights:

- a) departures
- b) flights in the traffic circuit as well as flights for training and instruction purposes including the departures resulting from them
- c) approaches

1.2 Aircraft shall be equipped with an operational transponder (interrogation mode A/C, 4096 responder codes) for VFR flights in the control zone sector concerned. Frankfurt aerodrome control tower may grant exemptions.

**Remarks**

ATC will not be provided at Frankfurt-Egelsbach Airfield, but FIS will be carried out („Egelsbach Info“).

Coordination between Frankfurt aerodrome control tower and Frankfurt-Egelsbach will be regulated accordingly.

**2. VMC Minima**

The following minima shall apply to VFR flights within Frankfurt CTR, sector Egelsbach:

- flight and ground visibility: 3 km
- ceiling: 1000 ft

The Federal Ministry of Transport, Building and Urban Affairs has established these minima in compliance with § 28 Article 3 LuftVO.

**3. Compulsory Reporting Points**

The following compulsory reporting points have been established:

- a) TANGO (▲): east of Dietzenbach,
- b) ECHO (▲): north of Eppertshausen,
- c) KILO (▲): east of Darmstadt,
- d) DELTA 1 (▲): Autobahn exit Darmstadt,
- e) JULIETT (▲): north of Griesheim / west of Weiterstadt.

## FRANKFURT-EGELSBACH EDFE

Folgende HPA\*-Pflichtmeldepunkte/Bedarfsmeldepunkte werden festgelegt:

- a) YANKEE 1 (▲): Östlich von Rödermark,
- b) YANKEE 2 (△): Südlich von Offenthal (Bedarfsmeldepunkt)
- c) DELTA 1 (▲): AB-Abfahrt Darmstadt,
- d) DELTA 2 (△): Auf der Autobahn südöstlich von Gräfenhausen (Bedarfsmeldepunkt)

\* HPA-Definition:

Als HPA (High Performance Aircraft) werden alle Jets sowie alle Luftfahrzeuge ab 4 t MTOM (ausgenommen Helikopter) bezeichnet. Diese müssen die An-/Abflugstrecken über die Pflicht-/Bedarfsmeldepunkte YANKEE 1 und 2 bzw. DELTA 1 und 2 nutzen. Die An-/Abflugstrecken YANKEE 1 und 2 stehen ausschließlich zur Nutzung durch HPAs zur Verfügung.

### 4. Anflüge

4.1 Anflüge sind bis maximal 1500 ft MSL wie folgt durchzuführen:

- a) Von TANGO (▲) auf Kurs über Grund von 241° (rw) über die Nordplatzrunde zur RWY 09.
- b) Von ECHO (▲) auf Kurs über Grund von 274° (rw) in den Endanflug RWY 27,
- c) von KILO (▲) auf Kurs über Grund von 338° (rw) in den Queranflug RWY 27,
- d) von DELTA 1 (▲) östlich entlang der A 5 in den rechten Queranflug RWY 09.

4.2 HPA-Anflüge sind bis maximal 1500 ft MSL wie folgt durchzuführen:

- a) Von YANKEE 1 (▲) über YANKEE 2 (△) in den Endanflug RWY 27,
- b) von DELTA 1 (▲), DELTA 2 (△) entlang der A 5 in den rechten Queranflug RWY 09.

4.3 Anflüge sind mit einer Geschwindigkeit von maximal 160 Knoten (IAS) durchzuführen.

4.4 Mit der örtlichen Luftaufsicht („Egelsbach Info“) ist spätestens 5 Minuten vor Erreichen der Meldepunkte Sprechfunkverbindung aufzunehmen.

4.5 „Egelsbach Info“ wird in Abstimmung mit der Flugplatzkontrollstelle Frankfurt einen Transponder-Code zuweisen. Dieser Transponder-Code ist bis zur Landung eingeschaltet zu lassen.

### 5. Platzrunden

5.1 Platzrunden sind nördlich und südlich des Landeplatzes in 1300 ft MSL zu fliegen, wobei die Autobahn A 5 nicht nach Westen überflogen werden darf.

5.2 Die Nordplatzrunde wird im Westen durch die Autobahn A 5 begrenzt und verläuft im Norden

The following HPA\* compulsory reporting points/ reporting points on request have been established:

- a) YANKEE 1 (▲): east of Rödermark,
- b) YANKEE 2 (△): south of Offenthal (reporting point on request)
- c) DELTA 1 (▲): Autobahn exit Darmstadt,
- d) DELTA 2 (△): on the Autobahn southeast of Gräfenhausen (reporting point on request)

\* HPA Definition:

All jets as well as all aircraft from 4 t MTOM (except helicopters) are classified as HPA (High Performance Aircraft). These aircraft must use the approach/ departure routes via the compulsory reporting points/reporting points on request YANKEE 1 and 2 and DELTA 1 and 2, respectively. The approach/departure routes YANKEE 1 and 2 are available for use by HPAs, exclusively.

### 4. Approaches

4.1 Approaches shall be conducted up to a maximum of 1500 ft MSL as follows:

- a) From TANGO (▲) on track 241° (true) via the northern traffic circuit to RWY 09.
- b) From ECHO (▲) on track 274° (true) into final approach RWY 27,
- c) from KILO (▲) on track 338° (true) into base leg RWY 27,
- d) from DELTA 1 (▲) east along the Autobahn A 5 into right base leg RWY 09.

4.2 HPA approaches shall be conducted up to a maximum of 1500 ft MSL as follows:

- a) From YANKEE 1 (▲) via YANKEE 2 (△) into final approach RWY 27,
- b) from DELTA 1 (▲), DELTA 2 (△) along the Autobahn A 5 into right base leg RWY 09.

4.3 Approaches shall be conducted with a speed of maximum 160 knots (IAS).

4.4 Radio telephony communication shall be established with the local Aviation Supervision Office („Egelsbach Info“) 5 minutes prior to reaching the reporting points, at the latest.

4.5 „Egelsbach Info“ will allocate a transponder code in coordination with Frankfurt aerodrome control tower. This transponder code shall be left switched on until landing.

### 5. Aerodrome Traffic Circuits

5.1 Aerodrome traffic circuits shall be flown north and south of the airfield at 1300 ft MSL. The Autobahn A5 shall not be crossed to the west.

5.2 The western boundary of the northern aerodrome traffic circuit is marked by the Autobahn

## Appendix 5c

**FRANKFURT-EGELSBACH  
EDFE**

zwischen den Ortschaften Langen und Egelsbach hindurch, wobei sie den besiedelten Gebieten der Stadt Langen zwischen der B3 und der Autobahn A 661 nach Süden ausweicht. Im Osten wird die Nordplatzrunde östlich an der Autobahn A 661 bis zum Erreichen der An-/ Abfluggrundlinie der Piste 09/27 des Landeplatzes geführt.

5.3 Die Südplatzrunde wird im Westen durch die Autobahn A 5 begrenzt und verläuft im Süden zwischen den Ortschaften Erzhausen und Wixhausen hindurch. Im Osten wird die Südplatzrunde östlich an Bayerseich vorbei geführt, so dass sich der Eindrehpunkt in den Endanflug Landebahn 27 bzw. in den rechten Querabflug Startbahn 09 am Autobahnende der A 661 östlich von Egelsbach befindet.

5.4 Platzrundenflüge haben bei der örtlichen Luftaufsichtsstelle „Egelsbach Info“ in ständiger Hörbereitschaft zu bleiben

5.5 Übungs- und Schulplatzrunden sind grundsätzlich in der Nordplatzrunde durchzuführen.

5.6 Die örtliche Luftaufsicht („Egelsbach Info“) kann die Anzahl der Platzrundenflüge beschränken.

**6. Abflüge**

6.1 Abflüge sind bis maximal 1500 ft MSL wie folgt durchzuführen:

- a) Von Startbahn 09 nach Osten bis ECHO (▲),
- b) von Startbahn 09 über den rechten Querabflug nach KILO (▲),
- c) von Startbahn 27 über die Nordplatzrunde und anschließend auf Kurs über Grund von 061° (rw) bis TANGO (▲),
- d) von Startbahn 27 geradeaus nach Westen zur A5, anschließend westlich entlang der A5 östlich an Weiterstadt vorbei und westlich am Industriegebiet Weiterstadt vorbei, danach auf Kurs über Grund von 265° (rw) bis JULIETT (▲).

6.2 HPA-Abflüge sind unter Beachtung der Höhenbeschränkung durch den Luftraum C und wie folgt durchzuführen:

- a) Von Startbahn 09 entlang YANKEE 2 (△) und YANKEE 1 (▲),
- b) von der Startbahn 27 geradeaus nach Westen zur A 5, anschließend entlang der A 5 in südliche Richtung über DELTA 2 (△) und DELTA 1 (▲).

6.3 Nach dem Abflug hat der Luftfahrzeugführer

A5. It goes over Langen and Egelsbach in the north and then makes a turn to the south, thus avoiding the populated areas of Langen between the B3 national road and the A661 motorway. In the east, the northern aerodrome traffic circuit goes east past the A661 motorway to the extended runway centreline 09/27 of the airfield.

5.3 The western boundary of the southern aerodrome traffic circuit is marked by the Autobahn A5 and goes over Erzhausen and Wixhausen in the south. In the east, the southern aerodrome traffic circuit goes east past Bayerseich, so that the turn-in point for final approach to runway 27 and/or the right crosswind from runway 09 is at the end of the Autobahn A661 east of Egelsbach.

5.4 Aerodrome circling flights shall maintain constant listening watch with the local aviation supervision office „Egelsbach Info“.

5.5 As a rule, training and instruction flights in the traffic circuit shall be conducted in the northern aerodrome traffic circuit.

5.6 The local aviation supervision office („Egelsbach Info“) may restrict the number of aerodrome circling flights.

**6. Departures**

6.1 Departures shall be conducted up to a maximum of 1500 ft MSL as follows:

- a) From RWY 09 to the east as far as ECHO (▲),
- b) From RWY 09 via the right cross-wind leg as far as KILO (▲),
- c) from RWY 27 via the northern traffic circuit, continuing on track 061° (true) as far as TANGO (▲),
- d) from RWY 27 straight ahead to the west to the Autobahn A 5, continuing to the west along the A 5 past Weiterstadt to the east and past the industrial area of Weiterstadt to the west, and continuing on track 265° (true) as far as JULIETT (▲).

6.2 HPA departures shall be conducted observing the vertical restrictions through Airspace C as follows:

- a) From RWY 09 along YANKEE 2 (△) and YANKEE 1 (▲),
- b) from RWY 27 straight ahead to the west to the A 5 continuing along the A 5 in a southern direction via DELTA 2 (△) and DELTA 1 (▲).

6.3 After departure, the pilot shall remain in

## Appendix 5d

**FRANKFURT-EGELSBACH  
EDFE**

in Funkkontakt mit „Egelsbach Info“ zu bleiben und Überflüge der Pflichtmeldepunkte dieser Stelle zu melden.

**7. Hinweis**

Überflüge der Ortschaften Bayerseich, Egelsbach, Erzhausen und Langen sind möglichst zu vermeiden.

**Anmerkung**

Die Angaben in Nrn 3 bis 6 werden im Lufthandbuch VFR in Kartenform dargestellt.

**VFR NACHT**

(NfL I-179/08)

1. Frankfurt CTR, Sektor Egelsbach nachts nicht aktiv.
2. Flugbeschränkungen:
  - Anzahl der Flüge in Koordination mit Flugleitung; WIN bis 1300 PPR; SUM bis 1200 PPR,
  - Generell mit Transponder A/C 4096,
  - Wegen Nähe und Höhe der Hochspannungseitung W, S und E soll bei Südplatzrunde der Sinkflug frühestens im Queranflug eingeleitet werden.

**3. Anflüge**

Im kontrollierten Luftraum werden anfliegende Luftfahrzeuge durch Langen RADAR grundsätzlich über die am Tage gültigen veröffentlichten Pflichtmeldepunkte (gem. Sichtflugkarte TAG) freigegeben. Diese Punkte sind die Freigabegrenze zur Durchführung eines Sichtfluges bei Nacht im kontrollierten Luftraum mit Landeabsicht in Frankfurt-Egelsbach. Luftfahrzeugführer sind gehalten, selbständig oder nach Aufforderung durch ATC, spätestens 7 NM vor Frankfurt-Egelsbach den kontrollierten Luftraum zu verlassen. Der Frequenzwechsel zu Egelsbach INFO ist erst nach Aufforderung durch Langen RADAR vorzunehmen.

4. Im Flugplatzverkehr ist Hörbereitschaft aufrechtzuerhalten. Überflüge von Ortschaften sind möglichst zu vermeiden.

5. Bedingungen für VFR-Nachtflüge im kontrollierten Luftraum siehe AIP VFR, ENR.

6. Wegen fehlender Nachtkennzeichnung der Hubschrauberplattform landen und starten Helikopter nach SS+30 ausschließlich auf der ASPH-RWY.

**Sonstige örtliche Flugbeschränkungen**

1 APR – 31 OCT, Mon–Fri ab 1700, Sat ab 1100, Sun + HOL sind Ausbildungsflüge nur gestattet, wenn Frankfurt CTR, Sektor Egelsbach nach dem Start sofort verlassen wird bzw. die Landung unmittelbar nach Einflug in diesen Luftraum erfolgt. Für Ausbildungsflüge wird zusätzlich eine Mindest-Flugdauer von 30 MIN zwischen Start und Landung verlangt.

radio contact with „Egelsbach Info“ and report overflying the compulsory reporting points to this unit.

**7. Note**

Overflying of the localities of Bayerseich, Egelsbach, Erzhausen and Langen shall be avoided, as far as possible.

**Remark**

The information in Paras 3 to 6 is depicted on charts in the AIP VFR.

**VFR NIGHT**

(NfL I-179/08)

1. Frankfurt CTR, Sector Egelsbach not active at night.
2. Flight restrictions:
  - Number of flights in coordination with Flugleitung;-WIN until 1300 PPR; SUM until 1200 PPR,
  - Generally with transponder A/C 4096,
  - Due to the proximity and height of the high-tension line W, S and E, descent shall be initiated during base at the earliest when using the southern traffic circuit.

**3. Approaches**

Approaching aircraft will generally be cleared by Langen RADAR in controlled airspace over the valid compulsory reporting points published during the day (in compliance with the Visual Operation Chart DAY). These reporting points are the clearance limit for conducting a visual flight at night in controlled airspace with an intended landing at Frankfurt-Egelsbach. Pilots are obliged to leave controlled airspace 7 NM prior to reaching Frankfurt-Egelsbach, at the latest - of their own accord or on request by ATC. The frequency shall not be changed to Egelsbach INFO until requested to do so by Langen RADAR.

4. In aerodrome traffic listening watch shall be maintained. Overflights of villages shall be avoided as far as possible.

5. Conditions for VFR flights at night within controlled airspace see AIP VFR, ENR.

6. Since the helipad is not marked at night, after SS+30 helicopters will land and take-off on the ASPH RWY, exclusively.

**Other Local Flight Restrictions**

1 APR – 31 OCT, Mon–Fri from 1700, Sat from 1100, Sun + HOL, training flights are only permitted if Frankfurt CTR, Sektor Egelsbach, is left immediately after take-off or aircraft lands immediately after entering this airspace. In addition, a minimum flight duration of 30 MIN between take-off and landing is requested for training flights.

Appendix 6

FRANKFURT-EGELSBACH  
EDFE

ELEV 385

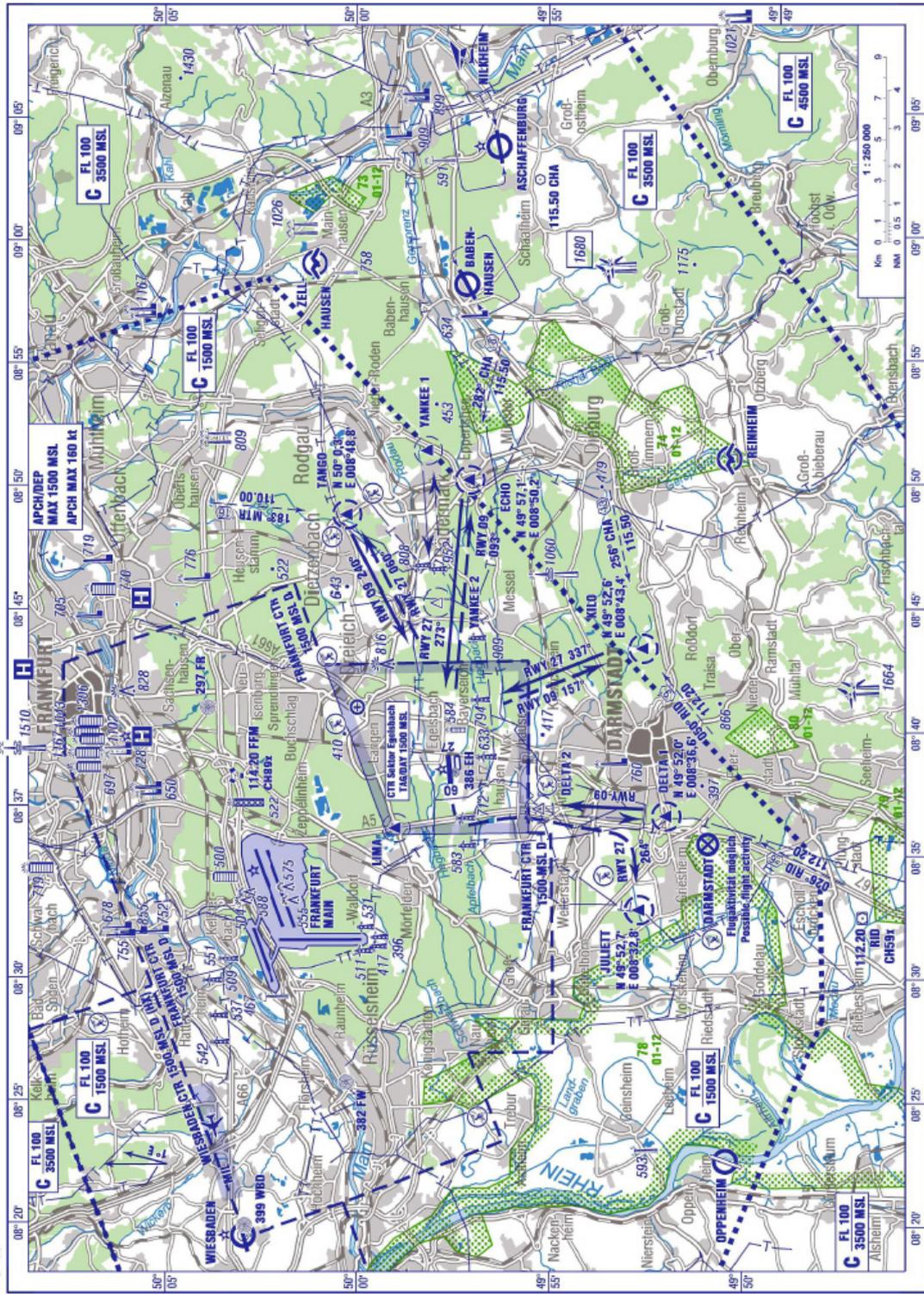
Sichtflugkarte  
Visual Operation Chart  
TAG  
DAY

EGELSBACH INFO  
118.400 Enr/Ge (25 NM 4000 ft GND)

EGELSBACH APRONVORFELD  
121.725 Enr/Ge

VDF 118.400

FIS  
LANGEN INFORMATION  
119.150

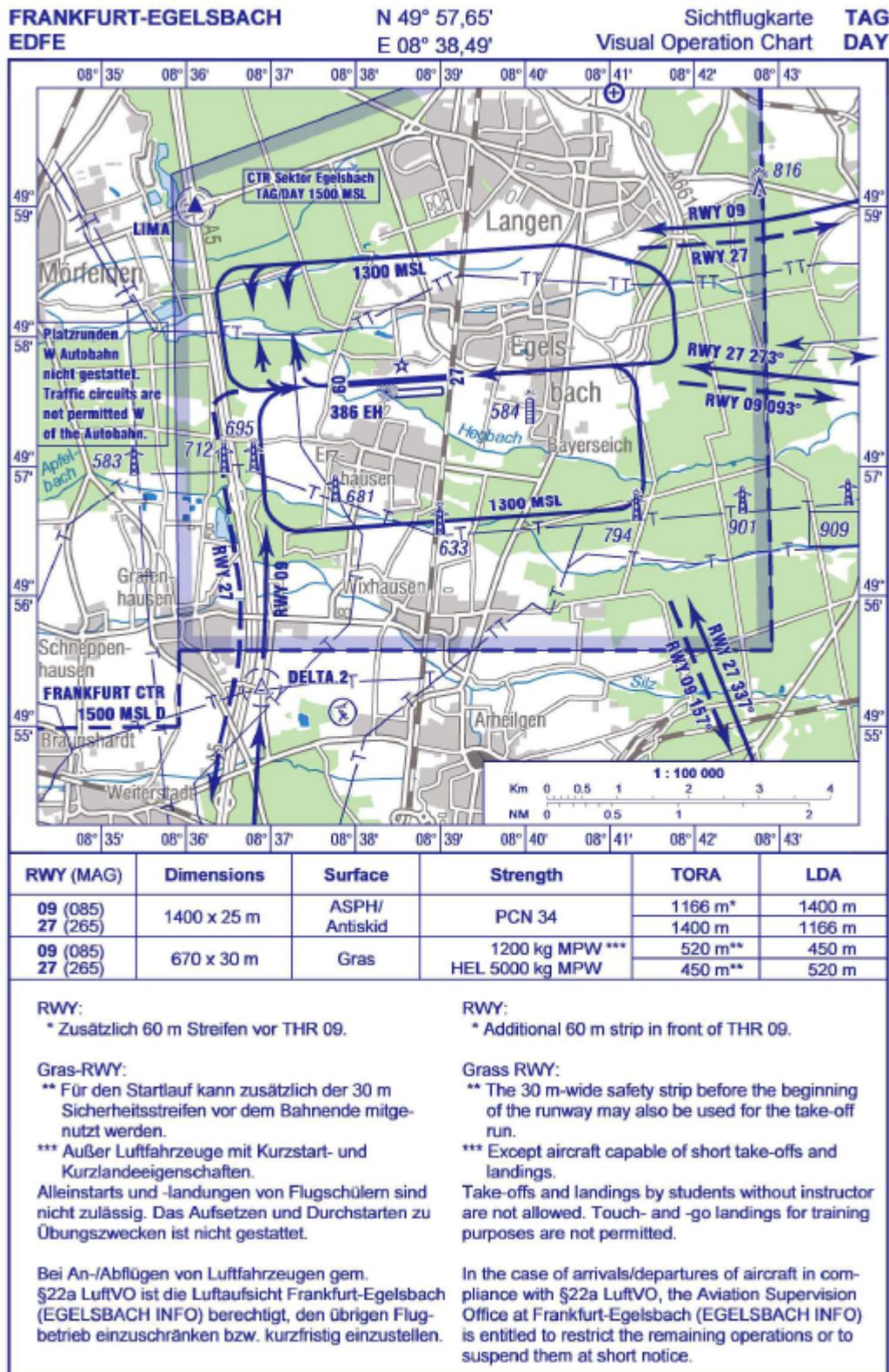


Berichtigung: RWY 27 Abflugstrecke nach JULIETT, höchstes Hindernis, Topografie.  
Correction: RWY 27 departure route to JULIETT, highest obstacle, topo.

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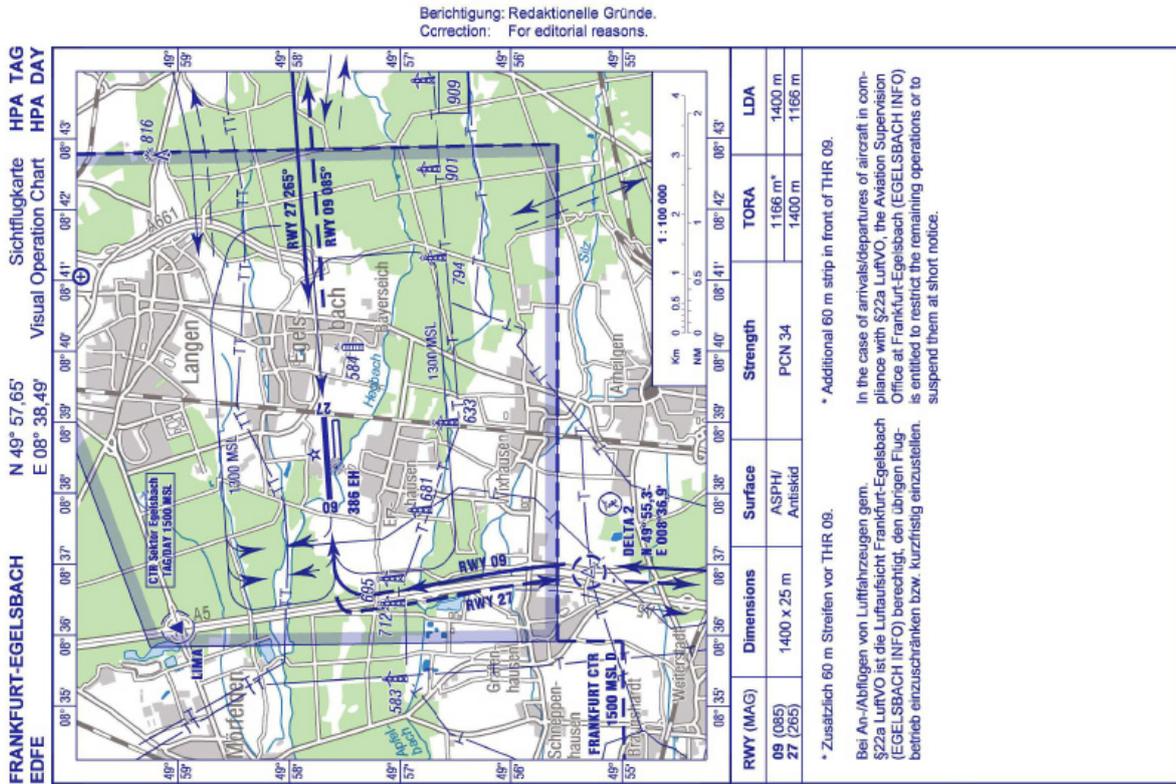
96 DEC 2014

## Appendix 7





Appendix 9



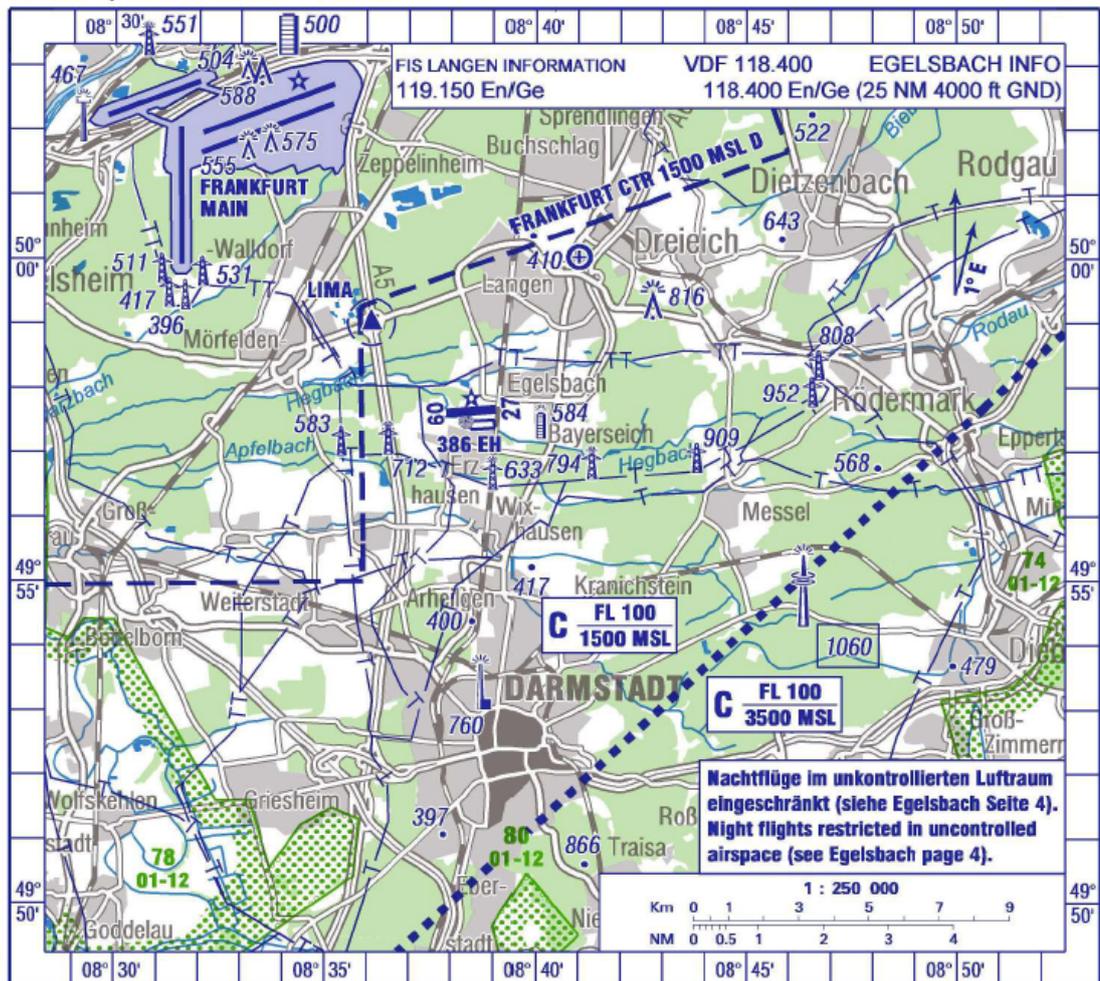
FRANKFURT-EGELSBACH  
EDFE

All jets as well as all aircraft from 4 t MTOM (except helicopters) are classified as HPA (High Performance Aircraft). These aircraft must use the approach/departure routes via the compulsory reporting points/ reporting points on request YANKEE 1 and YANKEE 2 and DELTA 1 and DELTA 2, respectively.

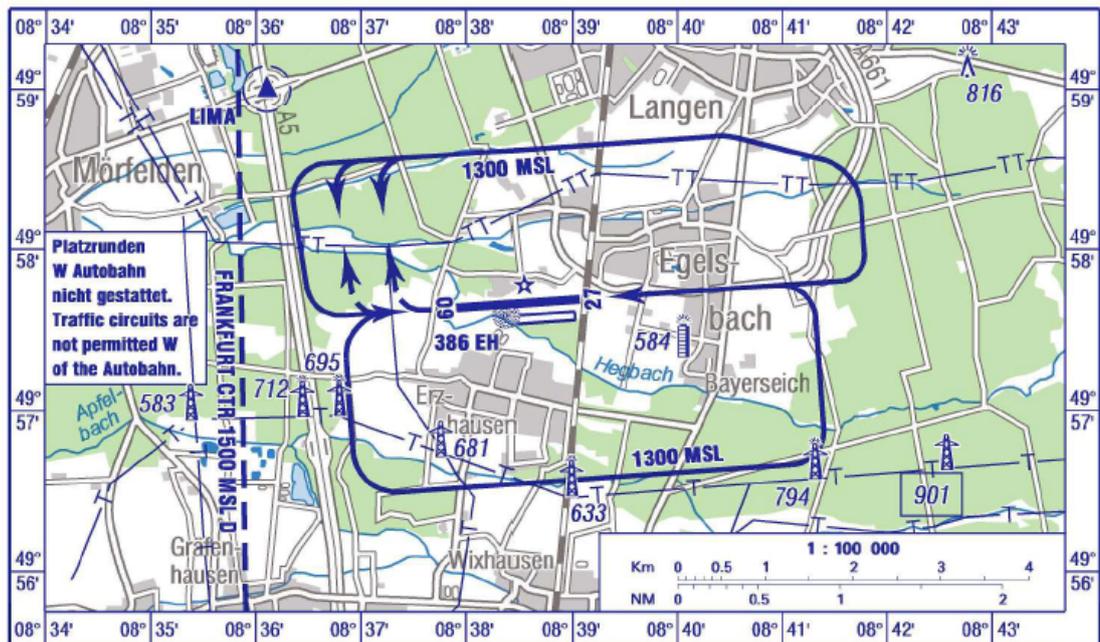
NUR/ONLY HPA

Alle HPA (High Performance Aircraft) werden alle Jets sowie alle Luftfahrzeuge ab 4 t MTOM (ausgenommen Helikopter) bezeichnet. Diese müssen die An-/Abflugstrecken über die Pflicht-/Bedarfsmeldepunkte YANKEE 1 und YANKEE 2 bzw. DELTA 1 und DELTA 2 nutzen.

Sichtflugkarte **NACHT** **ELEV 385** **FRANKFURT-EGELSBACH**  
 Visual Operation Chart **NIGHT** **ELEV 385** **EDFE**



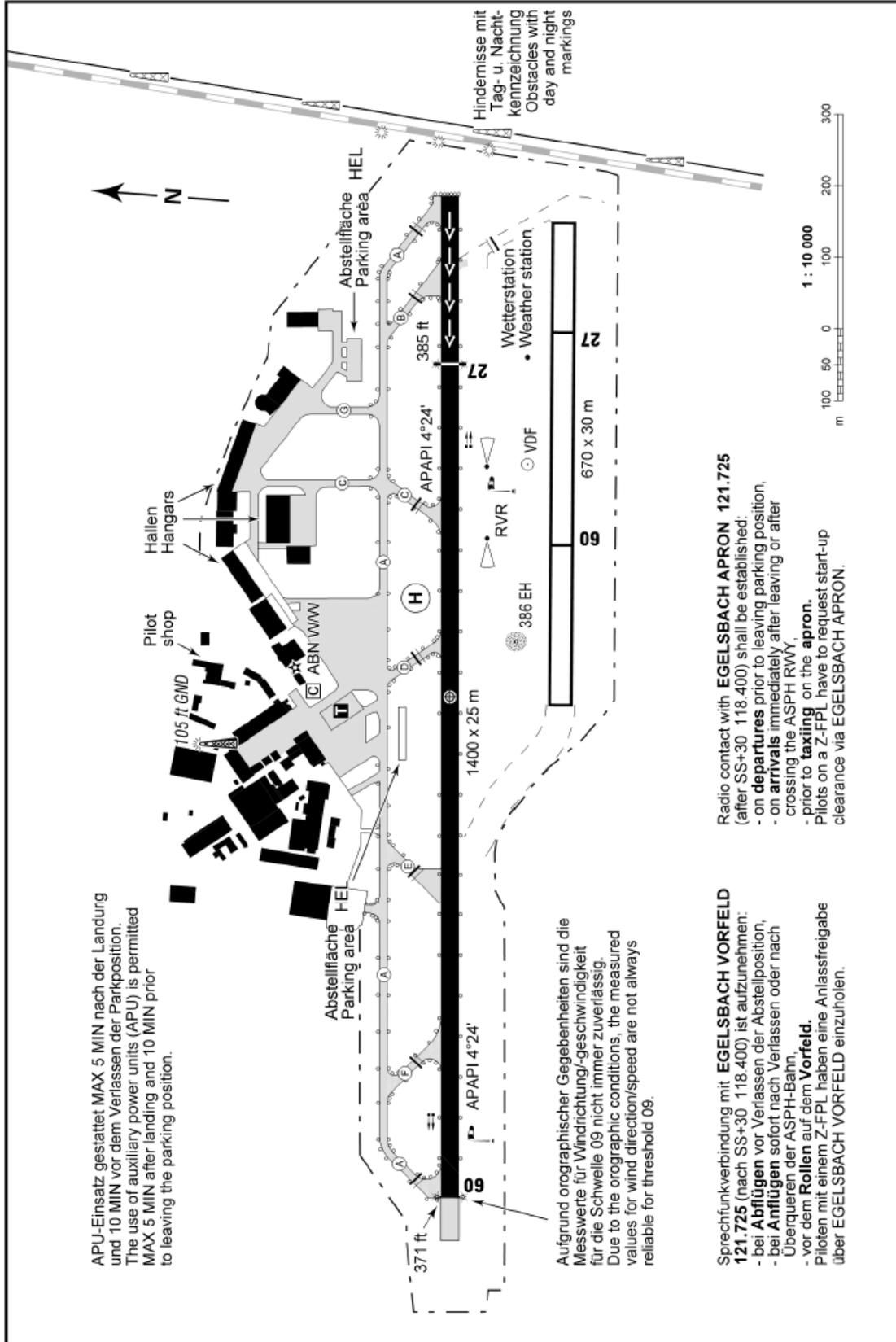
Berichtigung: Topografie.  
 Correction: Topo.



Flugplatzkarte  
Aerodrome Chart

FRANKFURT-EGELSBACH  
EDFE

Berichtigung: Bemerkung.  
Correction: Remark.



This investigation is conducted in accordance with the regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and the Federal German Law relating to the investigation of accidents and incidents associated with the operation of civil aircraft (Flugunfall-Untersuchungs-Gesetz - FIUUG) of 26 August 1998.

According to the law the sole objective of the investigation shall be the prevention of future accidents and incidents. It is not the purpose of this activity to assign blame or liability or to establish claims.

The present document is the translation of the German Investigation Report. Although efforts were made to translate it as accurate as possible, discrepancies may occur. In this case the German version is authentic.

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