



National Transportation Safety Board Aviation Accident Factual Report

Location:	BROOMFIELD, CO	Accident Number:	FTW97FA207
Date & Time:	06/01/1997, 1321 MDT	Registration:	N86EX
Aircraft:	Canadair F-86E MK.6	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal, 2 Minor
Flight Conducted Under:	Part 91: General Aviation -		

HISTORY OF FLIGHT

On June 1, 1997, at 1321 mountain daylight time, a Canadair F-86E MK.6, N86EX, impacted the ground while performing aerobatics during an air show at Jefferson County Airport, Broomfield, Colorado. The pilot received fatal injuries, two ground personnel received minor injuries, and the aircraft was destroyed. The flight was operating under Title 14 CFR Part 91 and no flight plan was filed. Visual meteorological conditions prevailed for this local flight which departed at 1306.

According to witnesses, the Air Boss running the air show, and several video tapes taken by spectators, the aircraft was observed to pass over runway 11L at high speed headed in a southeasterly direction at an altitude of approximately 400 above ground level (agl). The aircraft then assumed a nose up attitude of approximately 45 degrees and climbed to an estimated altitude of 2,500 feet agl, where it rolled to an inverted position and began a vertical dive (a reverse half-Cuban eight). One videotape, taken by a spectator on the ramp of the airport, depicted the aircraft in a vertical maneuver with the nose starting up toward the horizon as the aircraft disappeared behind a hill off the approach end of runways 29 left and right heading in a northwesterly direction. Shortly after the aircraft disappeared from view, a fireball erupted from below the crest of the hill.

Another videotape, taken from an area south of the airport, depicted the aircraft entering a vertical maneuver after rolling inverted at the top of the climb. As the aircraft descended in the vertical plane, the videotape showed the speed brakes that were mounted on the sides of the fuselage deploying and the horizontal stabilizer moving up and down. The tape also showed the leading edge devices mounted on the leading edge of the wings deploy to the extended position. This videotape showed the aircraft nose starting to rise toward the horizon and when the aircraft achieved a measured attitude of approximately 5 degrees nose down, the aircraft impacted the ground and erupted into a ball of flame.

Calculations made from information provided by the videotape taken from south of the airport, produced evidence the aircraft ground speed was approximately 485 knots at the time it

impacted the ground.

The remainder of the videotape taken from south of the airport depicted the wreckage scatter pattern and fireball deploying into, over, and around a commercial building and the wreckage coming to rest scattered through a field towards the southeast border of the airport. The building was constructed of brick and did not catch fire. (See attached map).

INJURIES TO PERSONS

In addition to the pilot, who received fatal injuries, a mother and daughter who were volunteer air show security guards received minor injuries when they were splattered with jet fuel from the aircraft during the impact sequence. They were located in the parking lot of the commercial building that was struck by debris during the accident.

OTHER DAMAGE

A commercial building belonging to Ball Aerospace was struck by flying debris and burning fuel from the aircraft as it disintegrated following impact. There were also several automobiles in the parking lot of the building that received damage. The building was unoccupied at the time, by agreement, as it was in the "sterile zone" established in the authorization for the air show by the Federal Aviation Administration (FAA).

PERSONNEL INFORMATION

The pilot, born in 1933, was a retired airline pilot. He held an airline transport pilot certificate in multiengine land airplanes with commercial privileges in single engine land airplanes. He was type rated in Boeing 727, Boeing 737, Boeing 757/767, Douglas DC3, and Douglas DC6/7. In addition, the pilot held a flight engineer certificate in turbo jet powered aircraft.

The pilot held a second class medical certificate dated March 5, 1997. There were no waivers or limitations on the certificate.

No records providing flight experience or other pilot generated records documenting flight experience, were found during the course of the investigation. According to available documents, the pilot flew as an Air Force/Air National Guard pilot for 14 years and as an airline pilot for 24 years. During his time in the Air Force/Air National Guard he flew fighters, and according to acquaintances was experienced in the F86. His FAA proof of competency in the F86 was signed September 8, 1996. Undocumented witness information provided information that the pilot had flown in several airshows on previous occasions, and a National Transportation Safety Board Air Safety Investigator witnessed the pilot's show performance the previous day. This person provided information that the pilot had performed the maneuver described in HISTORY OF FLIGHT of this document on the previous day, May 31, 1997.

AIRCRAFT INFORMATION

According to available information, the aircraft was built under license by Canadair in 1956 and served for a time in the Canadian military service. Following this service it was sold to the South African military and eventually was purchased for use in a drone program at White Sands Missile Range in New Mexico. It was sold to the pilot April 14, 1993, and issued an experimental exhibition airworthiness certificate on March 19, 1996.

North American Aviation, Inc., manufactured the original F86 series airplane as an all metal, single-place, high-performance day fighter. A General Electric J47 series axial flow turbojet engine that developed 7,400 pounds of thrust at sea level powered it. The airplane incorporated a swept wing design with tricycle retractable landing gear, slotted flaps, leading edge slats, fuselage mounted speed brakes, interconnected elevator and stabilizer, and an irreversible hydraulic control system. In addition, later versions, including the accident airplane, incorporated provisions for two external 120-gallon disposable fuel tanks and hard points for bombs and rockets.

Maximum speed at sea level was 707 miles per hour and the service ceiling was 54,600 feet.

The over all dimensions of the airplane were as follows: Wingspan - 37 feet 1 inch. Length - 37 feet 6 inches. Height - 14 feet 9 inches. Empty weight was 12,470 pounds and maximum gross weight was 17,100 pounds.

Performance values and weights for the accident aircraft are unknown. An Orenda Model 14 engine powered it. According to the Encyclopedia of World Aircraft, this engine developed 7,275 pounds of thrust at sea level.

The aircraft type was equipped with an ejection seat and the pilot was wearing a parachute of an unknown type. On this model F86 ejection was initiated by a trigger mechanism in the right armrest. According to the flight manual, when in a high-speed dive or spin, ejection must be initiated above 10,000 feet agl to be within the operating envelope of the seat. "Ejection initiated below 10,000 feet and/or under high 'G' loading decrease the probability of a successful ejection."

WRECKAGE AND IMPACT INFORMATION

The videotape taken by a spectator from an area south of the accident site provided evidence that as the aircraft descended through approximately 500 feet agl on a westerly track, the nose of the aircraft began to rise towards the horizon. It was approximately 5 degrees below the horizon when the aircraft impacted the ground in an open field.

The aircraft was equipped with a smoke generator, and was making smoke during the descent. The angle between the aircraft attitude and the smoke trail was measured to be 70 degrees. This provides evidence of angle of decent being 65 degrees with an aircraft body angle of 5 degrees.

The videotape of the accident showed the impact sequence. As the aircraft impacted, it disintegrated and a plum of fuel mist sprayed out to the west. This erupted into a fireball approximately 300 feet in height traveling west bound along the wreckage scatter pattern.

The initial impact crater was measured to be 33 feet 9 inches long and 17 feet 5 inches wide. The deepest penetration was estimated to be 24 inches.

The initial impact point was 1,294 feet 8 inches north of the north curb line of West 108th Avenue and 1,433 feet 11 inches west of the west road edge of Colorado highway 121. Debris was scattered 1,462 feet to the west from the initial impact point and was 350 feet wide at the widest point, 758 feet west of the initial impact point. The debris pattern was measured 116 feet west of the initial impact point at the east end of the Ball Aerospace building to be 254 feet wide.

The Ball Aerospace building was constructed of brick. The east wall of the building had numerous holes from parts of the aircraft that penetrated to the interior. The roof of the building contained numerous aircraft parts including a portion of a wing and one main landing gear assembly. A skylight on the roof was shattered and portions of the aircraft were found in the building.

There was a parking area located on the east side of the building. This area contained several automobiles, all of which sustained shrapnel damage from aircraft parts.

The burner section of the engine was found 216 feet west of the building with portions of the aircraft scattered throughout the area. A portion of the ejection seat and ejection seat cartridge was located approximately 75 feet to the north of the burner section.

The engine turbine assembly was the furthest piece of the aircraft along the scatter pattern.

TESTS AND RESEARCH

A review of the FAA Certificate of Authorization for the airshow and the pilot certification to participate was conducted during the investigation. Airsports International, Inc., who conducted the airshow, complied with the authorization and the pilot was properly certified.

Aerobatic pilots who witnessed the performance provided information that the half-Cuban eight maneuver should be entered at a minimum altitude of 4,000 feet agl when being performed by the F-86 and that the inverted time spent by this aircraft was insufficient to bleed off excess airspeed, which is necessary for successful completion of the maneuver.

ADDITIONAL DATA/INFORMATION

The wreckage was verbally released to Beegles Aircraft Services, Greeley, Colorado, on June 1, 1997.

Pilot Information

Certificate:	Airline Transport; Commercial	Age:	63, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	03/05/1997
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Canadair	Registration:	N86EX
Model/Series:	F-86E MK.6 F-86E MK.6	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Experimental	Serial Number:	1489
Landing Gear Type:	Retractable - Tricycle	Seats:	1
Date/Type of Last Inspection:	03/08/1997, AAIP	Certified Max Gross Wt.:	17100 lbs
Time Since Last Inspection:		Engines:	1 Turbo Jet
Airframe Total Time:	1978 Hours	Engine Manufacturer:	ORENDA
ELT:		Engine Model/Series:	14
Registered Owner:	JACK M. ROSAMOND	Rated Power:	7100 lbs
Operator:	JACK M. ROSAMOND	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BJC, 5671 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	1322 MDT	Direction from Accident Site:	340°
Lowest Cloud Condition:	Scattered / 8000 ft agl	Visibility	70 Miles
Lowest Ceiling:	Broken / 25000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	130°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	30° C / 9° C
Precipitation and Obscuration:			
Departure Point:	(BJC)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1306 MDT	Type of Airspace:	Class E; Demo Area; Special

Airport Information

Airport:	JEFFERSON COUNTY (BJC)	Runway Surface Type:	Asphalt
Airport Elevation:	5671 ft	Runway Surface Condition:	Dry
Runway Used:	29R	IFR Approach:	
Runway Length/Width:	9000 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	2 Minor	Aircraft Explosion:	On-Ground
Total Injuries:	1 Fatal, 2 Minor	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	NORMAN F WIEMEYER
Additional Participating Persons:	WALT WISE; DENVER, CO
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .