Aviation Investigation Final Report

Location:	CORPUS CHRISTI, Texas	**Incident Number:**	FTW97IA187
Date & Time:	May 11, 1997, 10:21 Local	**Registration:**	N16618
Aircraft:	Boeing 737-524	**Aircraft Damage:**	None
Defining Event:		**Injuries:**	59 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

The flight was issued vectors to intercept the final approach course of Runway 31 at Corpus Christi International Airport, and was cleared for the localizer 31 approach. The first officer was manipulating the controls, the In-Range and Approach checklists were completed, and the approach was briefed. A previous aircraft had requested the ILS RWY 13 approach and the tower controller had switched the ILS localizer from 31 to 13. After the completion of the approach, the tower controller did not reselect the localizer 31 approach. The flightcrew tuned in the localizer for Runway 31; however, they did not identify it by morse code. The captain reported that the localizer for Runway 31 was intercepted, 'although at the very beginning the course deviation bar did a couple of full scale deflections, but locked on 7 miles southeast' of the final approach fix. The aircraft was in and out of a broken cloud layer at 2,000 feet msl and the visibility was about 5 to 6 miles. After verifying all instruments were properly configured for the approach, the captain looked outside and 'saw a runway at the northern edge of the cloud they were in and out of.' The runway also had the number 31 painted on its approach end. The captain reported the field in sight to approach control and he was instructed to contact tower control. Tower cleared the flight to land. The flight landed at Cabaniss Field which is a Navy auxiliary field located 5 nautical miles southeast of Corpus Christi International Airport. Cabaniss is located on the final approach course for Runway 31 to Corpus Christi. The first officer had just completed ground and simulator differences training for the Boeing 737-300/500 series aircraft, and this was the first flight of his initial operating experience (IOE) for differences training in the aircraft. The first officer had never been to Corpus Christi, and it had been three years since the captain had been there.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be:

The flightcrew's inadequate in-flight planning and decision, and their failure to refer to the navaids needed for the instrument approach procedure. A factor was the lack of a minimum safe altitude warning from approach control.

Findings

Occurrence #1: MISCELLANEOUS/OTHER
Phase of Operation: LANDING

Findings
1. LANDED AT WRONG AIRPORT - FLIGHTCREW
2. (C) IN-FLIGHT PLANNING/DECISION - INADEQUATE - FLIGHTCREW
3. (C) IFR PROCEDURE - NOT FOLLOWED - FLIGHTCREW
4. FLIGHT/NAVIGATION INSTRUMENT(S) - NOT IDENTIFIED - FLIGHTCREW
5. APPROACH AIDS,ILS LOCALIZER - NOT ACTIVATED
6. (F) SAFETY ADVISORY - INADEQUATE - FAA(OTHER/ORGANIZATION)
7. RADAR,MSAW

Factual Information

On May 11, 1997, at 1021 central daylight time, Continental Airlines flight 1760, a Boeing 737-524, landed at the wrong airport near Corpus Christi, Texas. The 5 crew members and 49 passengers were not injured. The aircraft was being operated as a scheduled domestic passenger flight under the provisions of Title 14 CFR Part 121. Visual meteorological conditions existed at the time, and an instrument flight plan was on file for the flight. The flight departed Houston, Texas, about 0932, with a destination of Corpus Christi International Airport (CRP), Corpus Christi, Texas.

The flight crew reported to the NTSB investigator-in-charge that the First Officer had completed the ground and simulator difference training for the Boeing 737-300/500 series aircraft, and Continental Flight 203 from Newark International Airport (EWR), Newark, New Jersey, to (George Bush) Houston Intercontinental Airport (IAH), Houston, Texas, was the first flight of his initial operating experience (IOE) for differences training in the aircraft. The Captain was the check airman conducting the training. It was decided that the Captain would fly this first leg so the First Officer "could get adjusted to the 737-300 cockpit's normal routine since he hadn't actually flown for about three weeks." The First Officer was then to fly the second leg from Houston to Corpus Christi International Airport (CRP), Corpus Christi, Texas. The First Officer mentioned to the Captain that he had never been to that airport and the Captain said the last time he "had been in there was a little over three years ago."

The flight to Houston was normal with "time en route spent going over automation philosophy, capabilities of the aircraft, and general techniques for using the FMC (flight management computer)." At Houston, the flight crew changed aircraft from the 737-300 to a 737-500 series aircraft which is equipped with an EFIS (electronic flight instrument system) cockpit configuration.

The takeoff and climb out from Houston was normal, but "very quick due to a relatively light load," and the flight time to Corpus Christi was to be about 34 minutes. Upon reaching FL220, the flight's planned altitude, the flight crew began preparing for the descent and approach. Instruction was limited, but the First Officer "was doing a good job of managing the FMC." The Captain obtained ATIS information Mike for CRP, which reported the winds were from 010 degrees at 10 knots, 6,000 feet overcast, 10 miles visibility, and altimeter 30.06 inches. Since the flight was cleared to the CRP VOR, and there was no descent crossing fix or altitude to plan a normal descent on, the Captain showed the First Officer how to build a downtrack fix with the EFIS computer to create an informational crossing fix altitude.

Descent into Corpus Christi was initiated. The In-Range checklist was completed passing through about 18,000 feet. The flight crew briefed on the approach they would be using into CRP and "specifically mentioned about crossing the Ducky [final approach] fix at 1,600 feet, but

based on the ATIS information, we anticipated picking up the field visually to proceed on in for the landing." At about 13,000 feet they contacted Corpus Christi Approach and they were instructed to turn to a heading of 195 degrees and to continue their descent. At this point the Captain showed the First Officer how to build the approach using the FMC. He then showed the First Officer "how to use the intercept course function on the legs page of the FMC CDU (control display unit) by bringing Ducky into the active waypoint (1L) and then selecting intercept course (6R) and executing the function. This built the final approach course from Ducky on out to the southeast." The flight crew did not properly identify the localizer for Runway 31 via the audio Morse code signal.

After descending to 2,000 feet the aircraft was in and out of a broken cloud layer which "somewhat" obscured the flight crew's view of the surrounding area. The visibility was about 5 to 6 miles. Approach control instructed the flight to turn to a heading of 280 degrees and cleared them for the Localizer 31 approach into CRP. The Approach checklist was then completed. The Captain did a double check of the NAV AID set up to make sure they had the proper configuration for the approach. He noticed the First Officer had not armed the VOR mode of the Mode Control Panel so he pointed out this fact and armed it for him. They were about 2.5 miles right of the computed course at that time, still in and out of the clouds. The flight intercepted the localizer for Runway 31, "although at the very beginning the course deviation bar did a couple of full scale deflections as if when something interfered with the localizer but it settled down right away and we locked on and tracking it inbound about 7 miles southeast of Ducky," the final approach fix. After verifying all of the instruments were properly configured for the approach, the Captain looked outside and "saw a runway at the northern edge of the cloud they were in and out of." He then said, "runway in sight, let's land." The runway also had the number 31 painted on its approach end. The First Officer asked the Captain if they "could make the landing from here and the Captain said yes." The autopilot was disconnected and they started a visual descent to the runway. The Captain reported the airport in sight to approach control, and he was instructed to contact tower control. Tower control cleared the flight to land, and subsequently the aircraft made an uneventful landing on Runway 31 at Cabaniss Field.

Cabaniss Field (NGW) is a Navy auxiliary field located 5 nautical miles southeast of Corpus Christi International Airport. Current approach plates for the Localizer Runway 31 approach at CRP depicts Cabaniss on the approach course for Runway 31 just prior to the final approach fix Ducky. The aircraft remained on the ground for 2.5 hours with one engine running to provide air-conditioning for the passengers while waiting for ground transportation.

The Captain was employed by People Express on December 6, 1982. When Continental Airlines acquired People Express in 1986, the Captain had check airman status. On December 15, 1986, the Captain completed Continental's check airman ground school. On April 15, 1987, he completed the check airman conversion training for the 737 simulator, and then on August 11, 1987, he completed check airman proficiency for the 737 series aircraft. The Captain completed his last recurrent training on December 7, 1996. He had a total flight time in all aircraft of 10,500 hours, with 8,500 hours in the 737 series aircraft. The Captain is based in

Newark, New Jersey.

The First Officer was employed by Continental Airlines on July 27, 1987, as a Second Officer. On January 7, 1996, he completed initial 737-100/200 First Officer training. His last recurrent training was completed on January 9, 1997. On April 24, 1997, the First Officer completed the 737-300/500 series aircraft difference ground training, and on May 5, 1997, he completed the simulator differences training. He had a total flight time in all aircraft of 13,000 hours, with 1,006 hours in the 737-100/200 series aircraft. The First Officer is also based in Newark, New Jersey.

According to the ATC voice tape transcripts for the flight, at 1007:47, Continental 1760 reported on Corpus Christi Approach Control frequency reporting "with you out of one three thousand for one one thousand with Mike." The controller cleared the flight to descend at pilot's discretion to four thousand, and to fly heading one ninety five as a vector for the localizer three one approach. Continental 1760 repeated the clearance. At 1015:45, Continental 1760 was cleared to "descend and maintain two thousand." Continental 1760 then reported out of 4 thousand feet and repeated the clearance. At 1017:21, the controller transmitted, "Continental 1760 six miles from final approach fix, turn right heading 280 maintain at or above two thousand 'til established on the localizer, cleared localizer three one approach." Continental 1760 repeated the clearance. Later Continental 1760 asked the controller if he wanted the flight on the tower frequency. The controller replied, "not yet." At 1018:58, Continental 1760 reported the airport in sight. The controller told the flight to contact the tower. Continental 1760 reported on tower frequency, "Corpus Tower Continental uh seventeen sixty is with you on final for three one." At 1019:33, Corpus Christi tower replied, "Continental seventeen sixty Corpus tower good morning, runway three one cleared to land, wind zero two zero at one zero." Two seconds later, the sound of a low-altitude alert was faintly audible on the north radar channel. Then Continental 1760 acknowledged the landing clearance. At 1020:52, the radar approach controller called the local controller (tower) and asked, "what's the altitude on Continental." The local controller replied, "I don't know, it keeps dropping off." The approach controller then replied, "okay I just wanted to make sure he didn't land over there at Cabaniss." About fifteen seconds later, at 1021:11, Continental 1760 reported he was "going to gate fifteen," and tower informed them that they had landed at Cabaniss Field.

According to the tower Local controller, the traffic at CRP was light with no significant weather (2,300 feet msl overcast and 10 miles visibility). The Runway 31 localizer approach was in use and Runway 35 was closed for maintenance. The winds were from the north at 20 knots. Approximately one half hour before Continental 1760's arrival, a Cessna Citation had requested an ILS 13 approach, circle to land on runway 31 at CRP. The request was then made by the North radar controller to the Tower controller, who switched the ILS localizer from 31 to 13. After the completion of the approach, the Tower controller did not reselect the localizer 31 approach. During the controller change prior to the incident, the outgoing controller did not brief the incoming controller on the ILS localizer switch position.

At Corpus Christi CRP, runway 13/31 has an ILS approach to runway 13, and a Localizer approach to runway 31. These runways are actually the same runway but opposite directions. According to the FAA there is a national policy for frequency spectrum allocation, and there are only 40 ILS frequencies available. To conserve frequencies, both runway directions are actually served by different localizer antenna array utilizing the same frequency. To prevent the localizers from functioning simultaneously, an interlock feature is installed. The localizer signal provided for each direction is accompanied by its own discrete Morse code identifier. The switch for selecting the active approach is located in the Tower Cab and there is no indicator in the TRACON (terminal radar approach control) room to indicate to the radar controller which localizer approach is selected.

The position and staffing configuration of the TRACON at the time of the incident had all CRP East positions combined at the North Radar position. The Valley position and the Flight Data position were also open. Two controller were assigned to the Tower Cab; however, at the time of the incident, both the local and ground positions were combined.

Corpus Christi TRACON does not have recorded radar information because the ARTS Automation (ARTS IIA) does not record flight track file data. However, the High Speed (ASR37) Computer Print-out Sheet contains a record of low-altitude alerts. At 1019:39 a low-altitude alert was recorded on code 4775, Continental 1760.

The North radar controller reported that he did not remember hearing the MSAW (minimum safe altitude warning) low-altitude alert. There are separate alarms at each radar position for the MSAW, and the volume is preset and not adjustable by the controller.

The tower Local controller reported that he would not have heard a low-altitude alert because Continental 1760 had not entered the TWAAA (tower aural alarm area).

Naval Air Station Corpus Christi had recorded information on Continental 1760. They were requested to send the Air Traffic Control Group an altitude and time listing, and then a distance for the 2 radar "hits" surrounding the 1019:39 low-altitude alert. Interpolating the information, at the time the low-altitude alert occurred, the aircraft, Continental 1760, was about 2.4 miles from the end of the runway at Cabaniss at an altitude of about 950 feet.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Private	**Age:**	44,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 20, 1996
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	10500 hours (Total, all aircraft), 8500 hours (Total, this make and model), 8500 hours (Pilot In Command, all aircraft), 192 hours (Last 90 days, all aircraft), 67 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N16618
Model/Series:	737-524 737-524	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	27331
Landing Gear Type:	Retractable - Tricycle	**Seats:**	109
Date/Type of Last Inspection:	May 4, 1997 Continuous airworthiness	**Certified Max Gross Wt.:**	113500 lbs
Time Since Last Inspection:	73 Hrs	**Engines:**	2 Turbo fan
Airframe Total Time:	8557 Hrs	**Engine Manufacturer:**	Cfm
ELT:		**Engine Model/Series:**	CFM-56-3-B1
Registered Owner:	FIRST SECURITY BANK N.A.	**Rated Power:**	20000 Lbs thrust
Operator:	CONTINENTAL AIRLINES, INC.	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	CALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	5 miles
Lowest Ceiling:	Broken / 2000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	HOUSTON , TX (IAH)	**Type of Flight Plan Filed:**	IFR
Destination:	(CRP)	**Type of Clearance:**	IFR
Departure Time:	09:32 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	CABANISS FIELD NGW	**Runway Surface Type:**	Asphalt
Airport Elevation:	30 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	31	**IFR Approach:**	Localizer only;Visual
Runway Length/Width:	5000 ft / 150 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	54 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	59 None	**Latitude, Longitude:**	27.799831,-97.390625(est)

Administrative Information

Investigator In Charge (IIC):	Wigington, Douglas
Additional Participating Persons:	JAMES A HAYS; SAN ANTONIO , TX EUGENE A CARROLL JR.; HOUSTON , TX WILLIAM L SHUMAN; HOUSTON , TX
Original Publish Date:	May 4, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=20070