Aviation Investigation Final Report

Location:	Del Rio, Texas	**Accident Number:**	FTW01FA104
Date & Time:	April 26, 2001, 08:30 Local	**Registration:**	N80Q
Aircraft:	Cessna 402B	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

Upon arrival at the destination airport, the commercial pilot of the Part 135 cargo flight reported to the tower that he was 7 miles to the east, intending to land on runway 13. Subsequently, the pilot reported that he would circle the airport a few times "because he was having trouble with his autopilot." After circling, the pilot positioned the airplane on final approach to runway 13. The pilot of another airplane in the traffic pattern observed the accident airplane on a "one to two mile final, in a normal flight attitude but possibly a little low." After looking at her instruments for several seconds, she made visual contact again and observed the airplane impact the ground with the "tail of the aircraft falling forward on top of a fence." She further stated that all of the radio transmissions from the accident airplane were "calm and completely un-alarmed prior to the accident." Another witness, who was located at a fixed base operator at the airport, observed the airplane turn onto final. He stated that the airplane "suddenly stalled and slammed into the ground from about two hundred feet." The 1,140 hour pilot had accumulated a total of 70 hours in the Cessna 402. The airplane was found to be within its prescribed weight and balance limitations at the time of the accident. Ground impressions and airframe deformations indicated that the impact angle was approximately 25 degrees nose down on a magnetic heading of 155 degrees with the landing gear extended and the flaps partially extended. A post-impact fire destroyed the airplane. Flight control continuity was established from the aft section of the cockpit to the rudder and elevator flight control surfaces. The elevator trim tab (located on the right elevator) was measured with a protractor and found to be in the 28 degrees tab-up position (aircraft nose down). According to the airplane manufacturer's specifications, the maximum tab-up travel limit (when connected) is 5 degrees. The trim tab would not move freely by hand forces and appeared to be jammed. The elevator skin was cut open (top side) to observe the trim tab connecting hardware. It was observed that the clevis end of the trim tab actuator rod was wedged against the front spar of the elevator's internal structure. Additionally, the bolt which connected the clevis end of the tab actuator rod to the actuator screw, was missing. After further inspection, neither the bolt nor the nut were found in the cavity of the elevator structure

or the surrounding area. The clevis end of the actuator rod and the actuator screw were not damaged, and no impact damage was apparent on the trim tab. The operator's maintenance records showed that the right elevator had been replaced 10 flight hours prior to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the loss of control due to a jammed trim tab, which resulted from the failure of maintenance personnel to properly secure the trim tab actuator rod when installing a replacement elevator.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (C) FLIGHT CONTROL,ELEVATOR TAB - JAMMED
2. (C) MISCELLANEOUS,BOLT/NUT/FASTENER/CLAMP/SPRING - MISSING
3. (C) MAINTENANCE,INSTALLATION - IMPROPER - COMPANY MAINTENANCE PERSONNEL

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
4. (C) AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND
5. STALL/SPIN - INADVERTENT - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On April 26, 2001, approximately 0830 central daylight time, a Cessna 402B twin-engine airplane, N80Q, owned and operated by Texas Air Charters Inc., of Denton, Texas, was destroyed upon impact with the ground following a loss of control while on final approach to runway 13 at the Del Rio International Airport, near Del Rio, Texas. The instrument rated commercial pilot, who was the sole occupant of the airplane, was fatally injured. Visual meteorological conditions prevailed and an instrument flight plan was filed for the 14 Code of Federal Regulations Part 135 domestic cargo flight. The flight originated from the San Antonio International Airport (SAT) at 0745.

The pilot of N80Q reported on the Del Rio airport control tower radio frequency that he was 7 miles to the east, intending to land on runway 13. The pilot of another airplane (N4618V), who was executing multiple touch and go landings on runway 13, offered to vacate the pattern to allow N80Q to land. The pilot of N80Q then reported that he would circle the airport a few times "because he was having trouble with his autopilot." After circling, the pilot entered a final approach to runway 13.

The pilot of N4618V stated that she observed the accident airplane on a "one to two mile final, in a normal flight attitude but possibly a little low." After looking at her instruments for several seconds, she made visual contact again and observed the airplane impact the ground with the "tail of the aircraft falling forward on top of a fence." She further stated that all of the radio transmissions from the accident airplane were "calm and completely un-alarmed prior to the accident."

Another witness, who was located at a fixed base operation at the airport, observed the airplane turn onto final. He stated that the airplane "suddenly stalled and slammed into the ground from about two hundred feet."

PERSONNEL INFORMATION

The 28-year old pilot held a commercial pilot certificate with single, multi-engine, and instrument ratings. He also was a certified flight instructor. His first class medical certificate was dated January 20, 2000, and had a restriction to wear corrective lenses. According to records provided by the operator, the pilot had accumulated 1,140 flight hours as of December, 4, 2000. The operator estimated that the pilot had approximately 70 hours in the Cessna 402 at the time of the accident and had successfully completed the operator's pilot training requirements for cargo flights.

AIRCRAFT INFORMATION

The 1978 model Cessna 402B, serial number 402B1384, had accumulated a total of 19,279 airframe hours at the time of the accident. The airplane was equipped with two Teledyne Continental TSIO-520-EB engines. The left engine, serial number 248408-R, had accumulated 216 hours since its last overhaul, and the right engine, serial number 237098-R, had accumulated 1,291 since its last overhaul. Both engines were equipped with McCauley model 3AF32C87-NR three-blade propeller assemblies. The last 100-hour inspection of the aircraft was completed by the operator on April 22, 2001, at 19,269 airframe hours.

Maintenance records provided by the operator showed that the right elevator assembly was replaced during the last 100-hour inspection due to "buckling and oil canning."

The operator reported that the airplane was loaded with 920 pounds of cargo prior to its departure from San Antonio for the flight to Del Rio. The airplane was found to be within its prescribed weight and balance limitations at the time of the accident.

WRECKAGE AND IMPACT INFORMATION

The accident site was northwest of the airport, approximately 6,500 feet short of the landing threshold for runway 13 and about 200 feet to the right of the extended runway centerline. The GPS location was: north 29 degrees 23.214 minutes and west 100 degrees 56.314 minutes. The elevation, per the GPS, was 980 feet. The aircraft impacted the ground in a rural field which was relatively hard and dry. Ground impressions and airframe deformations indicated that the impact angle was approximately 25 degrees nose down on a magnetic heading of 155 degrees. The initial ground impressions correlated to the span of the wings, wing tip tanks, and the propellers. The subsequent energy (debris) path was on a bearing of about 140 degrees. The main wreckage came to rest in the inverted position about 132 feet from the initial ground impressions. The tail section came to rest inverted on a steel frame fence about 10 feet from the main wreckage. Most of the main wreckage was consumed by a post-impact fire; however, the tail section aft of the vertical fin leading edge exhibited minimal fire and impact damage. Charred remnants of the cargo aboard the airplane, mostly coupons and some small electronic devices were scattered throughout the wreckage area.

The cockpit area, cargo section, and most of the wing structure were extensively burned. The floor exhibited melted metal deposits. Flight control continuity was established from the aft section of the cockpit to the rudder and elevator flight control surfaces. The elevator trim tab (located on the right elevator) was measured with a protractor and found to be in the 28 degrees tab-up position (aircraft nose down). According to the airplane manufacturer's specifications, the maximum tab-up travel limit (when connected) is 5 degrees. The trim tab would not move freely by hand forces and appeared to be jammed. The elevator skin was cut open (top side) to observe the trim tab connecting hardware. It was observed that the clevis end of the trim tab actuator rod was wedged against the front spar of the elevator's internal structure. Additionally, the bolt, which connected the clevis end of the tab actuator rod to the

actuator screw, was missing. After further inspection, neither the bolt nor the nut were found in the cavity of the elevator structure or the surrounding area. The clevis end of the actuator rod and the actuator screw were not damaged, and no impact damage was apparent on the trim tab.

The rudder actuator was found extended 2.47 inches, which equates to 5 degrees tab-left. The aileron actuator extension was 1.5 inches, which equates to 16 degrees tab-down. The main landing gear actuator was mostly consumed by fire; however, the rods and gears were found in the gear down position. The left main gear upper structure was in the gear down/locked position The flap actuator indicated that the flaps were in a partially extended position. Vortex generators were found installed near the leading edge of the vertical fin.

The left engine was found separated from the airframe against the fence near the main wreckage on the centerline of the energy path. On-site examination of the engine did not reveal any pre-impact discrepancies. The left propeller assembly was found separated from the engine. Two blades and part of the hub were found about 34 feet from the initial impact point, and 3 feet to the left of the energy path centerline. Both of these blades were found bent and twisted with some bending. The third blade was found separated from the hub about 85 feet from the initial impact point and 8 feet left of the energy path. This blade was relatively undamaged.

The right engine was found separated from the airframe about 109 feet from the initial impact point and 10 feet to the right of the center of the energy path. On-site examination of the engine did not reveal any pre-impact discrepancies. The right propeller assembly was found separated from the engine about 99 feet from the initial impact point and 22 feet right of the center of the energy path. All three blades were retained in the hub and were severely bent and twisted.

No fuel was observed at the accident site. Evidence of a ground fire surrounded the initial impact area. Both fuel selector valves were connected to the control cables, and were beyond the "OFF" stops (inward). The fuel selector handles in the cockpit were consumed by fire. All engine and flight instruments were damaged by fire. The avionics equipment was also severely fire damaged. The control head for the autopilot assembly sustained severe fire damage. The three autopilot mode switches (including the on-off switch) were found in the "OFF" position.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed at the Bexar County Medical Examiner's Office, San Antonio, Texas. No pre-existing medical conditions were found. Toxicology tests were negative for carbon monoxide, alcohol, and drugs.

ADDITIONAL INFORMATION

The wreckage was released to the owner's representative upon completion of the field portion of the investigation.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	28,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:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	November 20, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 24, 2000
Flight Time:	1190 hours (Total, all aircraft), 70 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N80Q
Model/Series:	402B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	402B1384
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 22, 2001 100 hour	**Certified Max Gross Wt.:**	6300 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	19279 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-EB
Registered Owner:	TexAir Charters, Inc.	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	L4YA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DRT	**Distance from Accident Site:**	
Observation Time:	08:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	14°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	San Antonio, TX (SAT)	**Type of Flight Plan Filed:**	IFR
Destination:	Del Rio, TX (DRT)	**Type of Clearance:**	
Departure Time:	07:45 Local	**Type of Airspace:**	

Airport Information

Airport:	Del Rio International Airport DRT	**Runway Surface Type:**	Asphalt
Airport Elevation:	980 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	13	**IFR Approach:**	None
Runway Length/Width:	5100 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	29.389165,-100.942222

Administrative Information

Investigator In Charge (IIC):	Lemishko, Alexander
Additional Participating Persons:	Joseph A Hutterer; Cessna; Wichita, KS John Kent; Teledyne Continental Motors; Moblie, AL
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=52132