



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	MARATHON, Florida	<b>Accident Number:</b>	ATL96FA074
<b>Date &amp; Time:</b>	April 1, 1996, 02:58 Local	<b>Registration:</b>	N6427W
<b>Aircraft:</b>	Cessna P210N	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation		

## Analysis

During an over-water arrival at night, the pilot reported that the destination airport was in sight, and he canceled his VFR advisories. The controller acknowledged, advised the pilot to squawk 1200, and told him that a frequency change was approved. The pilot acknowledged at 0257:10, then there was no further radio communication with the pilot. At 0257:08, the encoded altimeter showed the airplane was at 1,200 feet, and radar data showed the airplane was descending with a ground speed of 183 to 189 knots. The final radar targets showed the airplane had descended to 200 feet, the heading was about 213 degrees, and the ground speed had increased to nearly 200 knots. Subsequently, the airplane descended into the water about 7 nautical miles north-northeast of the airport. The wreckage was recovered, and examination of the flight controls revealed no evidence of preimpact failure or malfunction. The landing gear and flaps were found retracted. The engine was recovered, and after replacement of components that were not recovered, the engine was started and operated normally. The propeller was recovered almost 1 year and 4 months after the accident; examination of it revealed no evidence of preimpact failure or malfunction. The airplane owner said that at about 1900 hours, before departing on the 1st leg of the flight, the pilot advised that he was tired due to his work/flying schedule. The owner stated that he was not aware that the pilot was going to fly the airplane after that conversation.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: failure of the pilot to maintain sufficient altitude during an over-water approach at night. Factors relating to the accident were darkness and pilot fatigue.

## Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT

### Findings

1. (F) LIGHT CONDITION - DARK NIGHT
2. TERRAIN CONDITION - WATER
3. (C) ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND
4. (F) FATIGUE(FLIGHT AND GROUND SCHEDULE) - PILOT IN COMMAND

## Factual Information

### HISTORY OF FLIGHT

On April 1, 1996, about 0258 eastern standard time, a Cessna P210N, N6427W, registered to a private individual, crashed into the Florida Bay, north-northeast of Marathon, Florida. Visual meteorological conditions prevailed near the area at the time and no flight plan was filed for the 14 CFR Part 91 business flight. The airplane was substantially damaged and the commercial-rated pilot and pilot-rated passenger were fatally injured. The flight originated about 0200 from the Palm Beach International Airport, West Palm Beach, Florida.

After departure while in contact with the Miami Air Route Traffic Control Center (ARTCC), at 0245.04, the pilot advised the controller "air shuttle 384 we're gonna start our descent into marathon." The controller acknowledged the request and advised the pilot to maintain VFR which the pilot acknowledged. The flight continued and at 0256.46, the pilot advised the controller that "...marathon in sight cancel VFR flight following and ah can we get you on this frequency on the way out." The controller advised yes and told the pilot to squawk VFR, and frequency change was approved." The pilot acknowledged this then the controller advised the pilot the frequency to contact the controller after departure from Marathon, which the pilot acknowledged at 0257.10. There was no further radio contact with the accident flight and there were no known witnesses to the accident.

Review of the Miami ARTCC Data Analysis Reduction Tool (DART) Log and Track Sort radar data each about 6 seconds apart for the assigned discrete transponder code revealed that from 0241.32, to 0245.26, the reported altitude from the encoding altimeter remained at 8,400 feet though the assigned altitude was 8,500 feet. The heading between those times varied between 209 degrees and 204 degrees with the ground speed varying between 150 knots and 161 knots. About 0245.32, which was about 28 seconds after the pilot reported beginning his descent into Marathon, the radar data indicates the beginning of a descent which averaged about 525 feet per minute (fpm) over the next 8 minutes with an increase in the ground speed to a maximum of 180 knots over that time. The heading varied between that time from 202 degrees to a maximum of 210 degrees. Review of the radar data over the next 3 minutes revealed that the descent rate increased to an average of 800 fpm with a maximum ground speed of 183 knots and an average heading of 207 degrees. The remaining six radar hits each about 6 seconds apart beginning at 0256.325 and ending at 0257.08 or about 35.5 seconds later, indicates that the airplane descended from 1,700 feet to 1,200 feet. The ground speed increased from 183 knots to 189 knots and the heading only changed one degree only once during that time. There was no further discrete radar targets after 0257.08, which was 22 seconds after the pilot was advised by the controller to squawk VFR, and 2 seconds before the pilot's last ATC recorded communication. The last discrete radar target was located 10.3 nautical miles and 205 degrees to the Marathon Airport.

Review of the Miami ARTCC National Track Analysis Program (NTAP) for non-discreet transponder code 1200 (not correlated) near the area of the last position of the assigned discreet transponder code revealed 3 radar targets. The first target at an altitude of 800 feet was 22 seconds after the last discreet target and was located 1.11 nautical miles from the last discreet target. The next non-discreet radar target 13 seconds later was located .72 nautical miles from the previous target at an altitude of 600 feet. The final radar target 24 seconds later was at an altitude of 200 feet. The heading and groundspeed changes between the first to second and second to third targets were 195 degrees and 213 degrees and 199.4 knots and 199.5 knots respectively. The airplane crash site was located 249 degrees and .42 nautical mile from the last non-discreet radar target.

## PERSONNEL INFORMATION

Information pertaining to the first pilot is contained on page 3 of the NTSB Factual Report-Aviation. Additionally, he was an FAA certificated airframe and powerplant mechanic and was employed as such by Florida Gulf Airlines. Before the accident flight he had flown company airplanes to ferry parts and perform maintenance on airplanes away from the main base located in Jacksonville, Florida. Additionally, according to the owner of the airplane, he had talked with the pilot about 1900 hours the day before the accident and the pilot thanked him for the use of his airplane, which the owner gave his permission. The pilot also told the owner that he was "...very tired because he had been working and flying a lot of hours, and that he was glad he was going on vacation that following Monday." The owner stated that he was not aware the pilot was going to fly his airplane after the conversation. Additionally, review of paperwork found in the airplane (mesa airlines, inc., daily aircraft trip log No. 446844) revealed that on March 31, 1996, the first leg of several was initiated at 2135 hours, and ended at 2218 hours, from Jacksonville to Gainesville, Florida. The remarks section for that flight indicates "340 radar." The second leg began at 2318 hours and ended at 0109 hours, for a flight from Gainesville to West Palm Beach, Florida. The remarks section for that flight indicates "59 rt n1." The accident flight was not logged.

Information pertaining to the pilot-rated passenger is contained in Supplement E. Additional information was provided by her roommate. On March 31st, she was called by company personnel to accompany the pilot on a round trip flight to Gainesville. After arriving at the company she was advised that the flight would continue to West Palm Beach, then to Marathon. She had previously advised her roommate that after flying with the accident pilot, she felt uncomfortable flying with him in part because he flew without paying much attention to what he was doing. She discussed this with the Assistant Chief Pilot who advised her that he knew the accident pilot was a kamikaze pilot but the company would limit her flying with the accident pilot.

## AIRCRAFT INFORMATION

Information pertaining to the airplane is contained in the NTSB Factual-Report, Aviation, and

in Supplements A and B. Review of the aircraft logbooks revealed that on May 9, 1990, an auxiliary fuel tank was installed in each wing of the airplane. The total usable quantity of both tanks combined is 32.5 gallons. The total usable fuel quantity of the wing fuel tanks is 87 gallons. The pitot static system was inspected on June 16, 1994. According to the owner of the airplane, it was not equipped with a radar altimeter or standby altimeter. The airplane information manual indicates that the yellow arc airspeed range is from 167-200 knots indicated airspeed.

## METEOROLOGICAL INFORMATION

Information pertaining to the weather is contained on pages 3 and 4 of the Factual Report-Aviation. Calculations indicate that the illumination of the moon at the crash site area was 92 percent. A weather observation taken at 0257, from the Key West International Airport, indicates in part that the wind was from 050 degrees at 4 knots. The crash site was located 44 nautical miles from the Key West airport.

## COMMUNICATIONS

A transcript of communication with the Miami Air Route Traffic Control Center is an attachment. There was no record of the pilot declaring an emergency with the controller though 2-way communications were maintained until about 1 minute 12 seconds before impact with the water. There was no record of the pilot squawking 7700.

## WRECKAGE AND IMPACT

The wreckage was recovered and taken to a nearby facility for examination which revealed that all airframe components necessary to sustain flight were attached or partially attached to the airframe with the exception of the left and right wing tips. The engine was separated from the airframe and the separated propeller was subsequently recovered on July 30, 1997. The exact location of where the propeller was found was not determined, but according to the Key Colony Beach Police Department, it was found between 3-6 miles north of Bonefish Tower in the Gulf of Mexico. The wing center spar was failed about 8 inches inside the cabin and examination of the fracture surfaces revealed evidence of overload failure. The left wing to fuselage attachment lug was observed to be bent aft and failed with evidence of overload failure. The attach bolt/nut were in place. The left wing main spar top cap and web section were bent aft about 2 feet outboard of the wing root area and the leading edge of the left wing exhibited chordwise crushing aft to the main spar. The right wing was attached to the fuselage at the forward lug and at the carry through spar fitting and the main spar was bent aft at about a 45-degree angle. A section of the right wing outboard of the outboard section of the flap was separated and was recovered. The leading edge of the right wing also exhibited chordwise crushing spanwise aft to the forward spar. Examination of the aileron, rudder, and elevator flight control systems revealed no evidence of preimpact failure or malfunction. Both main landing gears were observed to be in their respective wells and each downlock was not damaged. The nose landing gear support structure was impact damaged and the downlock

was not damaged and unlocked. The flaps were determined to be retracted. Examination of the vertical stabilizer/rudder revealed it was bent 90 degrees to the right about midspan and the left horizontal stabilizer was displaced down about 1 foot outboard from the attach point. The leading edge of the right horizontal exhibited chordwise crushing aft.

Examination of the engine revealed that the magnetos, starter, fuel control valve, manifold valve, and some of the fuel injection lines were not recovered. All engine mount legs were observed to be failed. All propeller mounting studs were in place with securing nuts installed and examination of all studs revealed aluminum material covering the threaded portion of the studs. The components that were not recovered were replaced and the engine was placed in a test stand and started and the core engine was found to operate normally.

Examination of the propeller revealed that the hub and the propeller blade serial numbers matched the maintenance records for the installed propeller. All propeller blades were accounted for and the hub mounting flange exhibited no evidence of fretting. One of the two propeller hub alignment dowels was bent. All of the threaded holes in the propeller hub were observed to be stripped. Examination of the three propeller blades revealed all were free to rotate in the hub and two of the three blades exhibited evidence of twisting of the leading edge towards the low pitch position and aft bending. The remaining blade was bent forward and gouges were noted on the trailing edge of the blade. The actuating pin holes in the butt end of each blade were observed to be elongated. Numerous impact signatures at the butt end of each blade precluded determination of propeller blade angle at impact. According to the engine manufacturer, the propeller blade bending and attachment damage are indicative of rotational energy at impact beyond that associated with low power or of a windmilling condition.

An estimation of propeller blade angle was calculated by the propeller manufacturer using the ground speed as determined by radar data (199 knots), the estimated airplane weight at the time of the accident (3,145 pounds), and the horsepower (253) and estimated engine rpm (2,400) to obtain a 1,000 foot-per-minute descent at 199 knots groundspeed. The calculations revealed an estimated propeller blade angle of 26.9 degrees.

## MEDICAL AND PATHOLOGICAL

Postmortem examinations of the pilot and passenger were performed by R.J. Nelms, Jr., M.D. Medical Examiner, District Sixteen, Monroe County, Florida. The cause of death for the pilot was listed as exsanguination due primarily to lacerations of the heart, resulting from multiple blunt impact injuries due to aircraft accident. The cause of death for the passenger was listed as exsanguination from multiple chest and abdominal injuries following blunt impact trauma due to aircraft crash. It was noted on the pilot's and passenger's autopsy reports that both wrists of the pilot were fractured and the left wrist of the passenger who was seated in the right front seat were fractured. Additionally, the medical examiner stated that scattered pigmented skin was noted on both which resulted from contact with fuel.

Toxicological analysis of specimens of the pilot were performed by the FAA Toxicology and Accident Research Laboratory and the Wuesthoff Memorial Laboratory. The results of the FAA analysis were negative for carbon monoxide, cyanide, volatiles, and tested drugs. The results of analysis by the Wuesthoff Laboratory were negative for tested drugs and carbon monoxide. The results were positive (.037 G/DL) in the blood for ethanol.

#### ADDITIONAL INFORMATION

According to paperwork (Daily Aircraft Trip Log) found in the wreckage and a statement from a line service employee, all four fuel tanks were filled on March 30, 1997, at Jacksonville, Florida. The trip log also indicates that the airplane was operated on five flights including the accident flight for a total of 4 hours 26 minutes, excluding the taxi times, at the time of the accident since fueling. Fuel consumption calculations were performed using the daily trip log which documents in part the off and on times, and also altitudes flown. The calculations were performed using the performance charts found in the airplane information manual. Using a temperature of 10 degrees Celsius above standard, a weight of 3,700 pounds, and about 73 percent brake horsepower for all flights, the total fuel consumed for all legs since fueling was calculated to be about 90 gallons. The total usable fuel capacity of the four fuel tanks was 119.5 gallons as indicated by the airplane information manual and information provided in the Supplemental Type Certificate.

Further review of the airplane information manual indicates that under the emergency procedures section pertaining to engine failure, the best glide knots indicated airspeeds (KIAS) for weights of 4,000, 3,350, and 2,700 pounds are 91, 83, and 74 respectively. Also, review of the emergency procedures for ditching with no engine power available indicates in part to approach at 85 KIAS with the flaps retracted.

According to a representative of the propeller manufacturer, the separation of the propeller from the engine and the aluminum material covering the threaded portion of the propeller mount studs is typical of an engine developing power at impact with water with the studs pulling from the threaded propeller hub holes.

The wreckage was released to Mr. Michael Barrett, Claims Manager, U.S. Aviation Underwriters, Inc., on April 11, 1996. The recovered propeller was also released to Mr. Barrett on October 10, 1997.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	27,Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane; Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	May 22, 1995
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1720 hours (Total, all aircraft), 29 hours (Total, this make and model), 1481 hours (Pilot In Command, all aircraft), 119 hours (Last 90 days, all aircraft), 44 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N6427W
<b>Model/Series:</b>	P210N P210N	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	P21000776
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	July 13, 1995 Annual	<b>Certified Max Gross Wt.:</b>	4000 lbs
<b>Time Since Last Inspection:</b>	68 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	1865 Hrs	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	TSIO-520-AF
<b>Registered Owner:</b>	EDWARD ANDREWS, JR.	<b>Rated Power:</b>	285 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	



## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Night/dark
<b>Observation Facility, Elevation:</b>	EYW ,4 ft msl	<b>Distance from Accident Site:</b>	44 Nautical Miles
<b>Observation Time:</b>	02:57 Local	<b>Direction from Accident Site:</b>	252°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	50°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29 inches Hg	<b>Temperature/Dew Point:</b>	23°C / 21°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	WEST PALM BEACH (PBI )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	(MTH )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	02:00 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	MARATHON MTH	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>		<b>Runway Surface Condition:</b>	
<b>Runway Used:</b>	0	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	24.7093,-81.079467(est)

## Administrative Information

**Investigator In Charge (IIC):** Sasser, Roff

**Additional Participating Persons:** ROBERT BLAKE; MIAMI, FL  
DALE CARTER; MARIETTA, GA  
WALTER J HUY; WICHITA, KS

**Original Publish Date:** August 29, 1997

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=3649>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).