National Transportation Safety Board
Aviation Accident Final Report

Location:	ST. THOMAS, VI	**Accident Number:**	MIA97FA082
Date & Time:	02/08/1997, 1932 AST	**Registration:**	N318AB
Aircraft:	Cessna 402C	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal, 3 Minor
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Scheduled		

Analysis

As the flight made a visual approach to the airport from the south over the sea, at night, the pilot changed his navigation radio from the VOR to the ILS system for runway 10 and lost DME reading from the VOR located on a hill north of the localizer course. The localizer showed the flight was south of the localizer course, and without DME from the VOR the pilot believed he was much closer to the island and the airport than the aircraft actually was. As the pilot attempted to make visual contact with the airport and maintain clearance from the hills he allowed the aircraft to descend and crash into the sea about 3 miles southwest of the airport. The pilot had not filed a FAA flight plan for the scheduled commuter flight. The pilot had been flying the route for 5 days and had no previous experience in the area. The pilot reported he had no mechanical malfunctions with the aircraft systems, flight controls, or engines. No FAA Operations inspectors had conducted surveillance on the company's flight operations in the Caribbean since service had begun in December 1996.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to maintain altitude while making a visual approach at night over water in black hole conditions resulting in the aircraft descending and crashing into the sea. Contributing to the accident was the failure of the pilot and operator to use all available air traffic control and navigational facilities, and the FAA Principle Operations Inspector's inadequate surveillance of the operation.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT

Findings
1. TERRAIN CONDITION - WATER
2. LIGHT CONDITION - DARK NIGHT
3. (C) VFR PROCEDURES - INADEQUATE - PILOT IN COMMAND
4. (C) INADEQUATE SURVEILLANCE OF OPERATION - FAA(ORGANIZATION)
5. (C) DESCENT - INADVERTENT - PILOT IN COMMAND
6. (C) VISUAL ILLUSION - PILOT IN COMMAND
7. (C) ALTIMETER - NOT USED - PILOT IN COMMAND

Factual Information

HISTORY OF THE FLIGHT

On February 8, 1997, about 1932 Atlantic standard time, a Cessna 402C, N318AB, registered to Tropical Transport Service, LTD., and operated by Air Sunshine, Inc. as a Title 14 CFR Part 135 scheduled domestic passenger flight from St. Croix, U.S. Virgin Islands, to St. Thomas, U.S. Virgin Islands, crashed into the Caribbean Sea, 3 miles southwest of St. Thomas. Visual meteorological conditions prevailed at the time and no flight plan was filed. The aircraft was destroyed and the airline transport-rated pilot and two passengers received minor injuries. Two passengers are missing and presumed to have received fatal injuries. The flight originated from St. Croix, the same day, about 1915.

The pilot stated to NTSB and U.S. Coast Guard personnel after the accident that the flight from St. Croix was uneventful. As he descended for approach to St. Thomas he established the aircraft on base leg for runway 10 and lowered the landing gear. He did not receive a safe indication for the nose landing gear. He noticed the altitude was about 1,100 feet msl as he recycled the landing gear. As he attempted to correct the landing gear system malfunction, the aircraft descended and crashed into the water.

In a written statement dated February 12, 1997, which was submitted to NTSB, and in an interview conducted by NTSB on February 20, 1997, the pilot stated, "our aircraft Cessna 402C N318AB, took off on runway 09 at St. Croix. I then contacted San Juan Approach control requesting VFR flight following radar service to St. Thomas. Approach Control assigned a squawk code and advised that it had radar contact with the aircraft. I climbed to 3500 feet and dialed in the frequency for the St. Thomas VORTAC and tracked inbound on the 180 degree radial. I planned to fly that radial inbound until I could make a right turn from a right base leg onto final approach for runway 10 at St. Thomas".

The pilot stated further, "as I approached the St. Thomas area from the south, I became concerned about the need to stay south of the St. Thomas VORTAC and the high hill area where it is located north of the localizer course to runway 10 at St. Thomas. I dialed in the frequency of the localizer course for the runway 10 approach so as to provide me with a northern boundary for my track on the approach to St. Thomas. I was concentrating on the localizer needle in order to obtain useable course guidance. The next thing I remember is the aircraft contacting the surface." He did not have any mechanical malfunctions with the aircraft before the accident. The pilot also stated in the interview that as he tuned the King KNS-80 radio from the St. Thomas VORTAC frequency to the localizer frequency, he forgot to push the distance measuring equipment (DME) hold button which would have kept the DME tuned to the VORTAC. By failing to do this he lost DME readout from the VORTAC. (See attached KNS-80 Pilot's Guide).

The pilot stated that after the accident he went back through the cabin and found no passengers in the cabin. He retrieved a life jacket and exited through the main entry door. The aircraft then sank. Once outside in the water he saw or heard the passengers. One was not wearing a life jacket and he gave this passenger his life jacket. He then told the passengers to follow him and he began swimming for the island. He was picked up later by a rescue helicopter and taken to St. Thomas Airport where an ambulance took him to the hospital.

The surviving passengers stated that before departure the pilot gave a short safety

briefing, but they did not recall any briefing about life vests. After departure from St. Croix, the pilot was notified that some passengers baggage had been left. They returned to St. Croix and picked up the baggage. They departed St. Croix again and after about 20 minutes they could see St. Thomas. As they approached St. Thomas the pilot was observed to continually lean forward and look out the front windshield as if he was looking for something. One passenger reported seeing a blinking red light on the center pedestal and that it had the word "hydraulic" on it. The engines were operating normally and the pilot did not report any problems or tell them to prepare for a crash. Suddenly the airplane crashed into the water. As the airplane came to a stop the lights went out.

The surviving passengers stated three passengers exited through the pilot's door and one passenger stayed in the airplane. The pilot also exited the aircraft. After they got in the water the pilot gave a life vest to one of the passengers. The three passengers that got out along with the pilot started swimming toward the island. One passenger got separated and was not seen again. One surviving passenger stated he was picked up by a helicopter and taken to the St. Thomas Airport where an ambulance took him to the hospital. The other surviving passenger stated he was picked up by a boat and taken to shore where a ambulance took him to the hospital.

The pilot and two surviving passengers were rescued by the U.S. Coast Guard about 3 hours after the accident. The body of one passenger was also located about this time but could not be recovered. The fourth passenger is missing.

PERSONNEL INFORMATION

The pilot, age 43, was hired by Air Sunshine, Inc. in October 1996, as a pilot on the Cessna 402 airplane. He holds an airline transport pilot (ATP) certificate, with airplane single-engine land, multiengine land, single-engine sea, multiengine sea, and rotorcraft helicopter. The pilot's FAA first class medical certificate was issued on December 2, 1996, with no restrictions or limitations.

According to company records, the pilot completed ground training on October 31, 1996. The pilot received a competency check required by Title 14 CFR Part 135.293 on November 4, 1996. On November 12, 1996, the pilot received a line check required by Title 14 CFR Part 135.299. On December 6, 1996, the pilot received an instrument proficiency check required by Title 14 CFR Part 135.297.

The pilot reported he had flown as pilot on Cessna 402 aircraft for two other commuter airlines. At the time of the accident he had accumulated about 13,000 total flight hours with 11,500 flight hours as pilot-in-command and 9,000 flight hours in the Cessna 402, all as pilot-in-command.

The pilot had just entered on flight duty at the beginning of the accident flight. He had accumulated 2 flight hours and 12 duty hours the day before the accident and had been off duty for 23 hours before the accident flight. He had arrived in the Caribbean on February 3, 1997, after being a passenger on N318AB as it was ferried from Fort Lauderdale to San Juan, Puerto Rico. This was his first time flying in the Puerto Rico-Virgin Island area. Records reflected that the pilot had made about 15 approaches, 5 of those at night, to St. Thomas before the accident flight. The pilot had accumulated 13 flight hours and 60 duty hours for the month of February, all within the 5 days before the accident. The pilot had accumulated 118 flight hours in the month of January 1997. (Additional pilot information is contained in this report under Pilot

Information and in attachments to this report).

AIRCRAFT INFORMATION

N318AB, a Cessna 402C, was a 1980 model aircraft and had accumulated 16,085 total flight hours at the time of the accident. The aircraft received a no. 3 inspection in accordance with a manufacturer's maintenance program on February 1, 1997, at aircraft total time 16,055. On September 11, 1995, the left and right altimeters, no.1 and no. 2 transponders, no. 1 and no. 2 altitude encoders, and the static system received a 24 month check required by Title 14 CFR Part 91.411 and 91.413 for instrument flight. The autopilot system received a 1 year check on October 31, 1996 and the magnetic compass received a 1 year check on December 27, 1996. (Additional aircraft information is contained in the aircraft section of this report and in attachments to this report).

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. Sun and moon calculations showed that at the location and time of the accident the sun was at an altitude of -18 degrees on a bearing of 271.8 degrees. The moon was at an altitude of .5 degrees on a bearing 274.9 degrees and had a 3% illumination. (Additional meteorological information is contained in this report under weather information and in attachments to this report).

AIDS TO NAVIGATION

Just before the accident the flight was receiving visual flight rules (VFR) flight following from the FAA San Juan Combined Enroute and Approach Control (CERAP)Facility. After departure from St. Croix, the flight was instructed to squawk transponder code 0473. The pilot complied with this and was identified on CERAP radar. Upon approaching St. Thomas the pilot was instructed to contact the FAA St. Thomas Control Tower. The pilot contacted the tower and was cleared to enter right base leg for the traffic pattern for runway 10. The flight was then cleared to land on runway 10.

The FAA reported the San Juan CERAP radar is equipped with a minimum safe altitude warning (MSAW) system. Aircraft that descend below the minimum safe altitude for a sector will trigger an alarm to the controller, who will then issue a warning to the pilot. FAA reported the system was operational on the night of the accident and that the tower controller at St. Thomas also had the capability to receive MSAW alerts from the San Juan CERAP radar and issue warnings to pilots. As the flight approached St. Thomas and descended below the safe altitude for the sector, the MSAW system did not trigger an alert. The FAA stated that the flight was operating under VFR and the transponder code 0473 assigned to the flight was within the 0400 code subset reserved for VFR flights, which is inhibited from triggering MSAW alerts to the controllers. (See attached FAA ATC data).

Recorded radar from the San Juan CERAP showed the flight climbed to 3,500 feet after departure from St. Croix. At about 1926, the flight began the descent from 3,500 feet for landing at St. Thomas. The flight continued descending on a northerly heading until crashing into the Caribbean Sea about 3 southwest of the airport. The data showed that at 1930:31, the flight descended through 1,100 feet. At 1931:00, the flight descended through 700 feet and at 1931:56, the flight descends below 100 feet. (See attached radar data).

COMMUNICATIONS

The pilot and ATC controllers reported there were no problems with communications.

WRECKAGE AND IMPACT INFORMATION

The aircraft wreckage was not located and recovered after the accident. All three landing gear, the right main gear door, and debris from the interior of the aircraft was found floating and recovered from the Caribbean Sea near the crash site by the U.S. Coast Guard. The two main landing gear had separated from the aircraft after failure of the strut housings. The fractures on the strut housings were consistent with overstress separation. The nose landing gear separated when the gear scissors separated and the gear slipped out of the gear strut housing. The right main landing gear door had aft crushing on the lower forward edge. The interior debris which was found contained the aft bulkhead panel which contained the FAA registration and airworthiness certificates.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot and two surviving passengers received minor injuries as a result of the accident and postcrash exposure in the sea. Two passengers were not recovered and are presumed to have received fatal injuries.

The pilot submitted to a drug screen in accordance with the Air Sunshine, Inc. drug testing program. Specimens taken from the pilot about 18 hours after the accident were negative for opiates, cannabinoids, and cocaine. (Additional medical and pathological information id contained in supplement K to this report).

COMPANY/OPERATIONS INFORMATION

Air Sunshine, Inc. is the holder of an FAA Air Carrier Certificate issued on September 2, 1982, and is authorized by Operations Specifications to conduct operations under Title 14 CFR Part 135. Air Sunshine is further authorized to use Cessna 402C aircraft in visual flight rules (VFR) and instrument flight rules (IFR) day or night operations. The principal base of operation is Fort Lauderdale, Florida, and the company conducts scheduled flight operations within the State of Florida and between St. Croix, St. Thomas, and San Juan, Puerto Rico. The Caribbean flight operations began in December 1996.

The Air Sunshine, Inc. Operations Manual, which is accepted by the FAA, requires that a VFR or IFR flight plan be filed for all revenue flights. The manual does give provisions for the pilot to file a VFR flight plan with the company provided an authorized flight following person follows the flight. According to the pilot, he did not file a VFR or IFR flight plan with the FAA for the accident flight. He did not file a VFR flight plan with the company, but did get flight following services through the company. Additionally, he maintained contact with FAA Air Traffic Control Facilities throughout the flight. Company officials stated the flight was not followed by an authorized flight following person. (See attached flight locating procedures).

The Air Sunshine, Inc. Operations Manual requires the pilot-in-command or a delegated crewmember to give a passenger briefing prior to takeoff. The briefing includes use of seat belts, location of emergency exits, life vests, and emergency briefing cards. Passengers stated the pilot did give a briefing prior to takeoff. (See attached passenger briefing procedures and card).

ADDITIONAL INFORMATION

A passenger reported that he observed a red light with the word "hydraulic" blinking on the center control pedestal prior to the accident. The Cessna 402C handbook shows the hydraulic failure warning light is mounted in the annunciator panel on the left side of the

pilot's instrument panel. (See page from Cessna 402C Pilot Operating Handbook).

The FAA Airmans Information Manual and Instrument Flying Handbook describes a phenomenon called "Featureless Terrain Illusion" in sections titled "Illusions Leading To Landing Errors". The publications state, "an absence of ground features, as when landing over water, darkened areas, and terrain made featureless by snow can create the illusion that the aircraft is at a higher altitude than it actually is. The pilot who does not recognize this illusion will fly a lower approach." Other writers have termed this illusion as black hole conditions and reported that pilots have actually descended early and landed short of the runway and in some cases crashing into the sea while approaching over water. (See attached pages from FAA publications and FAA Civil Aeromedical Institute fax).

Aircraft components which were recovered by the U.S. Coast Guard after the accident were released by NTSB on March 12, 1997, to Steve Smalley, Air and Sea Recovery.

FAA SURVEILLANCE

Federal Aviation Administration records showed that the Air Sunshine, Inc. Air Carrier Certificate is held and managed by inspectors from the FAA Flight Standards District Office in Fort Lauderdale, Florida. The company received a Regional Air Safety Investigation Program (RASIP) inspection between February 12 and February 16, 1996. The Principal Operations Inspector last performed a base inspection on October 24, 1996, and the Principal Maintenance Inspector last performed a base inspection on May 20, 1996.

Maintenance Inspectors from the FAA San Juan Flight Standards District Office performed one ramp inspection and two en route inspections of the Air Sunshine, Inc. Caribbean operations in January 1997. Neither the Principal Operations Inspector, Principal Maintenance Inspector, Principal Avionics Inspector, or any FAA Operations Inspectors conducted inspections of the Air Sunshine, Inc. Caribbean operations since service was begun in December 1996. (See attached FAA records).

Pilot Information

Certificate:	Airline Transport	**Age:**	43, Male
Airplane Rating(s):	Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	12/02/1996
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	13000 hours (Total, all aircraft), 9000 hours (Total, this make and model), 11500 hours (Pilot In Command, all aircraft), 290 hours (Last 90 days, all aircraft), 103 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N318AB
Model/Series:	402C 402C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	402C0318
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	02/01/1997, AAIP	**Certified Max Gross Wt.:**	7210 lbs
Time Since Last Inspection:	30 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	16085 Hours	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-VB
Registered Owner:	TROPICAL TRANSPORT SVCS., LTD.	**Rated Power:**	325 hp
Operator:	AIR SUNSHINE, INC.	**Operating Certificate(s) Held:**	Commuter Air Carrier (135)
Operator Does Business As:		**Operator Designator Code:**	RSHA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	STT, 24 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	1945 AST	**Direction from Accident Site:**	20°
Lowest Cloud Condition:	Scattered / 2000 ft agl	**Visibility**	20 Miles
Lowest Ceiling:	None / 0 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	26°C / 22°C
Precipitation and Obscuration:			
Departure Point:	ST. CROIX, VI (STX)	**Type of Flight Plan Filed:**	None
Destination:	(STT)	**Type of Clearance:**	VFR; VFR on top
Departure Time:	1915 AST	**Type of Airspace:**	Class D

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal, 2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal, 3 Minor	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	JEFFREY L KENNEDY	**Report Date:**	04/10/1998
Additional Participating Persons:	STANLEY SANTIAGO; SAN JUAN, PR HOWARD HOLLIS; FT. LAUDERDALE, FL		
Publish Date:			
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 pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		