



National Transportation Safety Board Aviation Accident Final Report

| | | | |
|-------------------------|----------------------|-------------------------|-------------|
| Location: | NUNAPITCHUK, AK | Accident Number: | ANC97FA037A |
| Date & Time: | 03/25/1997, 1123 AST | Registration: | N451SA |
| Aircraft: | Short Brothers SC7 | Aircraft Damage: | Destroyed |
| Defining Event: | | Injuries: | 1 Fatal |

Flight Conducted Under: Part 91: General Aviation - Positioning

Analysis

The pilot of Cessna 207A, N800GA, was returning to his company base, passing about 2 miles north of a remote airstrip that was along the route of flight. The airstrip did not have any control tower. [Communications around an uncontrolled airport are conducted on a common traffic advisory frequency (CTAF)]. The pilot of a Short SC7, N451SA, announced his departure from the same airstrip on the CTAF, and took off in a northerly direction. He then began a climbing right turn toward the same destination as the Cessna 207A was proceeding. The two airplanes collided in mid-air, about 1.49 nautical miles east-northeast of the airstrip, which was about 18.3 miles west of their destination. They were observed spiraling downward from about 800 ft above the ground. Both airplanes were found lying flat and upright on a frozen lake, entangled together at the accident site. The Cessna's burned wreckage was lying on top of (and positioned toward the aft third of) the burned wreckage of the Short SC7.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: inadequate visual look-out by the pilots of both airplanes, which resulted in their failure to see-and-avoid each other's airplanes.

Findings

Occurrence #1: MIDAIR COLLISION

Phase of Operation: CLIMB - TO CRUISE

Findings

1. (C) VISUAL LOOKOUT - INADEQUATE - PILOT IN COMMAND
2. (C) VISUAL LOOKOUT - INADEQUATE - PILOT OF OTHER AIRCRAFT

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF THE FLIGHT

On March 25, 1997, about 1115 Alaska standard time, a Short SC7 airplane, N451SA, and a Cessna 207A airplane, N800GA, collided in mid-air, about 1.49 nautical miles east-northeast of Nunapitchuk, Alaska. The accident location is about 18.3 miles west of Bethel, Alaska. Both airplanes were being operated as visual flight rules (VFR) cross-country positioning flights to Bethel under Title 14 CFR Part 91 when the accident occurred. N451SA, registered to and operated by Arctic Circle Air Service Inc., Anchorage, Alaska, and N800GA, registered to and operated by Grant Aviation Inc., Anchorage, Alaska, were destroyed by impact and postimpact fire. The pilots of each airplane, the sole occupants of their respective airplanes, received fatal injuries. Visual meteorological conditions prevailed. VFR company flight following procedures were in effect for both flights. N451SA departed the village of Nunapitchuk about 1112 for the flight to Bethel. N800GA departed the village of Scammon Bay, Alaska, about 1000 for Bethel.

The operators of each airplane reported their respective flights were returning to Bethel after delivering all of their cargo. A ground witness (a pilot for another operator), reported he landed at Nunapitchuk about 1107, and was taxiing to the airport ramp. N451SA was beginning to taxi away from the ramp for departure. The ground witness heard the pilot of N451SA announce his departure intentions from Nunapitchuk on an aircraft radio. N451SA then departed on runway 36. N451SA did not circle over the airport or return to the vicinity of the airport. About 1 and 1/2 minutes later, the witness' attention was directed toward the northeast by a ground agent. The witness observed N451SA descending toward the ground in a nose low attitude. The airplane was rotating counter-clockwise in a descending spiral about 800 feet above the ground.

Several villagers, and the ground witness, responded to the accident scene, and observed the wreckage burning on the surface of a small frozen lake. At the point of rest on the ground, the wreckage of N800GA was located entangled with the wreckage of N451SA. N800GA was positioned toward the aft end of N451SA.

The accident occurred during the hours of daylight at latitude 60 degrees, 55.068 minutes north, and longitude 162 degrees, 23.700 minutes west.

CREW INFORMATION

The pilot of N451SA held an airline transport pilot certificate with an airplane multi-engine land rating. He held commercial pilot privileges with airplane single-engine land and sea ratings. In addition, the pilot held a flight instructor certificate with airplane single-engine, multi-engine, and instrument airplane ratings. The most recent first-class medical certificate was issued to the pilot on February 21, 1997, and contained no limitations.

According to the pilot/operator report submitted by the operator, the pilot of N451SA accrued a total aeronautical experience of about 3,170 hours, of which 130 hours were in the accident airplane make and model. In the preceding 90 and 30 days prior to the accident, the report listed a total of 220, and 91 hours, respectively.

The pilot of N800GA held a commercial pilot certificate with airplane single-engine land, multi-engine land, and instrument airplane ratings. The pilot also held a flight instructor

certificate with airplane single-engine, multi-engine, and instrument airplane ratings. The most recent first-class medical certificate was issued to the pilot on February 28, 1997, and contained no limitations.

According to the pilot/operator report submitted by the operator, the pilot of N800GA had accrued a total aeronautical experience of about 2,437 hours, of which 1,136 hours were in the accident airplane make and model. In the preceding 90 and 30 days prior to the accident, the report listed a total of 125, and 55 hours, respectively.

AIRCRAFT INFORMATION

N451SA had accumulated a total time in service of 7,473 hours. The airplane is maintained under the manufacturer's inspection program. A 100-hour inspection was completed on March 17, 1997, 23 hours before the accident. The colors of the airplane included blue paint on the upper end of the vertical stabilizers.

N800GA had accumulated a total time in service of 10,192.5 hours. The most recent annual inspection was accomplished on April 3, 1996. A 100-hour inspection was completed on February 15, 1997, 61 hours before the accident. The colors of the airplane included white paint on the fuselage and wings, with a maroon or red strip along the side of the airplane.

METEOROLOGICAL INFORMATION

The closest official weather observation station is Bethel, Alaska, which is located about 18.3 nautical miles east of the accident site. On March 25, 1997, at 1051, an Aviation Routine Weather Report (METAR) was reporting in part: Wind, 012 degrees (magnetic) at 15 knots; visibility, 60 statute miles; sky clear; temperature, 6.1 degrees F; dew point, -6.7 degrees F; altimeter, 29.89 inHg.

A ground witness at the Nunapitchuk Airport reported the weather conditions at the time of the accident included clear skies; visibility, about 60 miles; wind, 045 degrees at 15 knots.

The position of the sun, in relation to the accident site, was 137.4 degrees (magnetic), at an elevation of 24.4 degrees above the horizon.

COMMUNICATIONS

The pilot of N451SA announced his departure from Nunapitchuk on the common traffic advisory frequency (CTAF) of 122.9 Hz. The operator's company radio frequency is 123.30 Hz.

The pilot of N800GA notified his company's dispatcher of an expected time of arrival (ETA) of 13 minutes on the company radio frequency of 123.12 Hz. The exact time of the call was not noted, but the company dispatcher noted an ETA of 1120 on their flight planning log sheet. Based on an average ground speed for N800GA of 120 knots, the ETA was estimated to have been provided when the airplane was about 26 miles from Bethel.

No further communication was received from either pilot.

AERODROME AND GROUND FACILITIES

The Nunapitchuk Airport has a single gravel runway on a 360/180 degree magnetic orientation. Runway 36 is 2,040 feet long by 60 feet wide. The airport is surrounded by Class E airspace that begins 700 feet above the ground.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge (IIC) examined the wreckage at the accident site on March 26, 1997. During the on-scene examination of the wreckage, strong winds, exceeding 35 knots, hampered efforts to keep items of wreckage from blowing away. The wreckage of N800GA was located within the wreckage of N451SA. Both airplanes were lying flat, and upright on the surface of a frozen lake. Areas of wind blown snow covered the surface of the lake. No evidence of ground impact gouges, or evidence of a wreckage path, were noted. The surface of the snow exhibited sooting in an area around, and downwind, from the wreckage.

N451SA

The wreckage of N451SA exhibited extensive fire damage. The nose of N451SA was oriented at the point of rest on a magnetic heading of 303 degrees, (all heading/bearings noted in this report are oriented toward magnetic north). The left wing remained attached to the fuselage, but all of the outer skin was melted. The aileron and flap assemblies remained attached to the airplane. The left engine remained attached to the wing, and was extensively consumed by fire. It was canted about 45 degrees toward the left wing tip. The propeller blades were broken, and the exposed blade ends were melted, about 8 inches outboard from the hub.

The right wing remained attached to the fuselage, but was displaced slightly forward from its normal geometry, and oriented with the leading edge canted downward. The inboard end of the wing at the fuselage attach point was fire damaged. The rest of the wing was not damaged by fire, and exhibited slight upward crushing of the underside of the leading edge at the wing tip. The outboard wing tip cap was separated from the wing, and was located about 6 feet to the right of the wing tip. The aileron and flap assemblies remained attached to the airplane, and were drooped downward about 50 degrees.

The right engine was attached to the wing. The propeller blades were loose in the hub. Each blade exhibited "S" bending, and torsional twisting. The outer glass of the right wing landing light bulbs was broken. Each bulb filament was tightly coiled and unbroken.

The cockpit area, and the instrument panel were upright and damaged by fire. Examination of the panel revealed the number 2 communication radio was set on a frequency of 119.80 (Bethel ATIS). The number 1 communication radio was destroyed. A navigation radio was set to a frequency of 114.10 (Bethel VOR). The automatic direction finder radio (ADF) was set to a frequency of 795. The nose of the airplane, forward of the instrument panel, including the radome, was not fire damaged. This area displayed vertical crushing and flattening.

The entire fuselage, from the instrument panel to just forward of the horizontal stabilizer was consumed by fire. The left vertical stabilizer was bent and folded to the right, downward over the horizontal stabilizer. It was consumed by fire. The left rudder trim tab separated from the stabilizer, and was located about 200 yards downwind from the wreckage. The trim tab was bent to the right about midspan at an angle of about 45 degrees. The leading edge of the trim tab exhibited a red paint smudge about 6 inches below the top end of the tab.

The right, outboard end of the horizontal stabilizer was fractured about 3 feet inboard from the right vertical stabilizer attach point at the outboard end of the horizontal stabilizer. The right vertical stabilizer, and the fractured portion of the horizontal stabilizer was folded to the left, in an aft and upward direction. The bottom end of the right vertical stabilizer exhibited upward crushing.

The left, inboard surface of the right vertical stabilizer displayed about an 8 to 12 inch wide

scuff mark, located about midspan, and about mid-chordline of the stabilizer. The scuff mark was an off-white color, and was oriented on about a 20 degree angle from a midspan/mid-chordline position in a downward, and forward direction toward the leading edge of the stabilizer. The right rudder was attached to the stabilizer. The right rudder trim tab was broken at the upper pivot attach point.

N800GA

The wreckage of N800GA was located lying within, and lying on, the aft third of the fuselage of N451SA. The vertical stabilizer, and the lower surface of the right horizontal stabilizer of N800GA was not consumed by fire. The empennage was positioned just beyond the aft edge of the horizontal stabilizer of N451SA. The empennage of N800GA was lying upright, and oriented about 45 degrees to the right of the longitudinal axis of N451SA.

The right wing of N800GA was observed pivoted to the left over the destroyed fuselage, and destroyed left wing of N800GA. It was not fire damaged. Search personnel reported the wing was originally positioned to the right, and forward of the right vertical stabilizer of N451SA. High wind conditions had moved the wing since the accident.

Examination of the right wing of N800GA revealed upward crushing along the underside of the wing, and upward bending about midspan. The outboard end of the flap was bent upward. The right aileron was separated from the wing at the inboard pivot attach point. It was bent upward about midspan, and folded in an upward and outward direction. It remained attached to the wing at the outboard pivot point. The aileron exhibited several blue paint smudges, about midspan, on the underside of the aileron. The paint smudges were oriented on about a 25 degree angle from the leading edge of the aileron, in an inboard direction, to the trailing edge. The aileron also displayed tearing, and crushing along the underside of the aileron.

Examination of N800GA's left wing position light bulb filament revealed it was slightly stretched and unbroken. The outer glass of the left wing landing light bulbs was broken. Each bulb filament was tightly coiled and unbroken.

The fire damaged fuselage of N800GA, including its engine, was positioned within, and lying over, the longitudinal axis of N451SA's main fuselage. The landing gear assembly was positioned over the horizontal stabilizer spar of N451SA. The engine of N800GA was located just aft of the left landing gear sponson of N451SA. The engine was canted about 20 degrees to the left, and was extensively fire damaged. It was positioned along the left side, and extended slightly to the left, (southeast) of the outline of N451SA's fuselage. One propeller blade was broken away from the hub. A second blade was broken from the hub and melted. The third blade remained attached to the hub, but was broken about 6 inches outboard from the hub and fire damaged. The entire fuselage, the left wing, and the left horizontal stabilizer of N800GA was destroyed by fire.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of both pilots was conducted under the authority of the Alaska State Medical Examiner, 5700 E. Tudor, Anchorage, Alaska, on March 26, 1997.

FIRE ASPECTS

A ground witness reported fire was not initially visible until both airplanes struck the ground.

ADDITIONAL INFORMATION

The operator of N451SA reported the normal flight profile from Nunapitchuk would include a left, 270 degree turn over the airport. After departure, the pilot would usually climb to 1,500 feet above the ground while en route to Bethel. The airplane will cruise at 160 knots. The operator indicated the climb speed is usually 120 knots, which usually equated to a ground speed of about 100 knots.

The Director of Operations of N800GA reported the normal cruising altitude from Scammon Bay to Bethel would normally be 1,500 feet msl.

The Aeronautical Information Manual (AIM) - Basic Flight Information and ATC Procedures, states, in part:

"This manual contains the fundamentals required in order to fly in the United States National Airspace (NAS). It also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms used in the Air Traffic Control System, and information on safety, accident, and hazard reporting..."

"Flight Information Publication Policy a. The following is, in essence, the statement issued by the FAA Administrator and published in the December 10, 1964, issue of the Federal Register, concerning the FAA policy as pertaining to the type of information that will be published as NOTAMS and in the Aeronautical Information Manual. 1. It is a pilot's inherent responsibility to be alert at all times for and in anticipation of all circumstances, situations and conditions affecting the safe operation of the aircraft. For example, a pilot should expect to find air traffic at any time or place. At or near both civil and military airports and in the vicinity of known training areas, a pilot should expect concentrated air traffic and realize concentrations of air traffic are not limited to these places..."

The Aeronautical Information Manual (AIM), Section 4-1-9. Traffic Advisory Practices at Airports Without Operating Control Towers, states, in part:

"a. Airport Operations Without Operating Control Tower 1. There is no substitute for alertness while in the vicinity of an airport. It is essential that pilots be alert and look for other traffic and exchange traffic information when approaching or departing an airport without an operating control tower. This is of particular importance since other aircraft may not have communication capability or, in some cases, pilots may not communicate their presence or intentions when operating into or out of such airports. To achieve the greatest degree of safety, it is essential that all radio equipped aircraft transmit/receive on a common frequency identified for the purpose of airport advisories. 2. An airport may have a full or part-time tower or Flight Service Station (FSS) located on the airport, a full or part-time UNICOM station or no aeronautical station at all. There are three ways for pilots to communicate their intention and obtain airport/traffic information when operating at an airport that does not have an operating tower: by communicating with an FSS, a UNICOM operator, or by making a self-announce broadcast. b. Communicating on a Common Frequency. 1. The key to communicating at an airport without an operating control tower is selection of the correct common frequency. The acronym CTAF which stands for Common Traffic Advisory Frequency, is synonymous with this program. A CTAF is a frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency and is identified in appropriate aeronautical publications. 2. The CTAF frequency for a particular airport is contained in the A/FD, Alaska Supplement, Alaska Terminal

Publication, Instrument Approach Procedure Charts, and Standard Instrument Departure (SID) charts. Also, the CTAF frequency can be obtained by contacting any FSS. Use of the appropriate CTAF, combined with a visual alertness and application of the following recommended good operating practices, will enhance safety of flight into and out of all uncontrolled airports. c. Recommended Traffic Advisory Practices. 1. Pilots of inbound traffic should monitor and communicate as appropriate on the designated CTAF from 10 miles to landing. Pilots of departing aircraft should monitor/communicate on the appropriate frequency from start up, during taxi, and until 10 miles from the airport unless the FARs or local procedures require otherwise. 2. Pilots of aircraft conducting other than arriving or departing operations at altitudes normally used by arriving and departing aircraft should monitor/communicate on the appropriate frequency while within 10 miles of the airport unless required to do otherwise by the FARs or local procedures. Such operations include parachute jumping/dropping, en route, practicing maneuvers, etc."

The Aeronautical Information Manual (AIM), Section 5. Pilot/Controller Roles and Responsibilities, 5-5-8. See and Avoid, states, in part:

"a. Pilot - When meteorological conditions permit, regardless of type of flight plan or whether or not under control of a radar facility, the pilot is responsible to see and avoid other traffic, terrain, or obstacles."

Federal Aviation Regulation (FAR) 91.113, Right of Way Rules: Except water operations, states, in part:

"(a) Inapplicability. This section does not apply to the operation of an aircraft on water. (b) General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right of way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear. (c) In distress. An aircraft in distress has the right of way over all other air traffic. (d) Converging. When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so), the aircraft to the other's right has the right of way. (e) Approaching head-on. When aircraft are approaching each other head-on, or nearly so, each pilot of each aircraft shall alter course to the right. (f) Overtaking. Each aircraft that is being overtaken has the right of way and each pilot of an overtaking aircraft shall alter course to the right to pass well clear."

WRECKAGE RELEASE

The Safety Board released the wreckage of both airplanes to the owner's representatives on March 27, 1997. No parts or components were retained by the Safety Board.

Pilot Information

| | | | |
|----------------------------------|---|--|----------------------------|
| Certificate: | Airline Transport; Flight Instructor; Commercial | Age: | 27, Male |
| Airplane Rating(s): | Multi-engine Land; Single-engine Land; Single-engine Sea | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | Seatbelt, Shoulder harness |
| Instrument Rating(s): | Airplane | Second Pilot Present: | No |
| Instructor Rating(s): | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | Toxicology Performed: | Yes |
| Medical Certification: | Class 1 Valid Medical--no waivers/lim. | Last Medical Exam: | 02/21/1997 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | |
| Flight Time: | 3170 hours (Total, all aircraft), 130 hours (Total, this make and model), 3070 hours (Pilot In Command, all aircraft), 220 hours (Last 90 days, all aircraft), 91 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

| | | | |
|--------------------------------------|--------------------------------|---|----------------------------|
| Aircraft Manufacturer: | Short Brothers | Registration: | N451SA |
| Model/Series: | SC7 SC7 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | SH-1972 |
| Landing Gear Type: | Tricycle | Seats: | 2 |
| Date/Type of Last Inspection: | 03/17/1997, 100 Hour | Certified Max Gross Wt.: | 12500 lbs |
| Time Since Last Inspection: | 23 Hours | Engines: | 2 Turbo Prop |
| Airframe Total Time: | 7473 Hours | Engine Manufacturer: | Garrett |
| ELT: | Installed, not activated | Engine Model/Series: | TPE331-2-201A |
| Registered Owner: | ARCTIC AIR GROUP | Rated Power: | 675 hp |
| Operator: | ARCTIC CIRCLE AIR SERVICE INC. | Air Carrier Operating Certificate: | Commuter Air Carrier (135) |
| Operator Does Business As: | | Operator Designator Code: | ACSA |

Meteorological Information and Flight Plan

| | | | |
|----------------------------------|-------------------|-------------------------------|---------------|
| Conditions at Accident Site: | Visual Conditions | Condition of Light: | Day |
| Observation Facility, Elevation: | BET, 123 ft msl | Observation Time: | 1051 AST |
| Distance from Accident Site: | 18 Nautical Miles | Direction from Accident Site: | 100° |
| Lowest Cloud Condition: | Clear / 0 ft agl | Temperature/Dew Point: | -14°C / -18°C |
| Lowest Ceiling: | None / 0 ft agl | Visibility | 60 Miles |
| Wind Speed/Gusts, Direction: | 15 knots, 12° | Visibility (RVR): | 0 ft |
| Altimeter Setting: | 29 inches Hg | Visibility (RVV): | 0 Miles |
| Precipitation and Obscuration: | | | |
| Departure Point: | (16A) | Type of Flight Plan Filed: | Company VFR |
| Destination: | BETHEL, AK (BET) | Type of Clearance: | None |
| Departure Time: | 1120 AST | Type of Airspace: | Class E |

Airport Information

| | | | |
|----------------------|-------------------|---------------------------|-----------------|
| Airport: | NUNAPITCHUK (16A) | Runway Surface Type: | Gravel |
| Airport Elevation: | 12 ft | Runway Surface Condition: | Snow--compacted |
| Runway Used: | 36 | IFR Approach: | None |
| Runway Length/Width: | 2040 ft / 60 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: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Fatal | Latitude, Longitude: | |

Administrative Information

| | | | |
|-----------------------------------|--|---------------|------------|
| Investigator In Charge (IIC): | SCOTT R ERICKSON | Adopted Date: | 05/29/1998 |
| Additional Participating Persons: | VERENE MILLER; ANCHORAGE, AK THOMAS LAPP; ANCHORAGE, AK STEVE W ANDERSON; ANCHORAGE, AK | | |
| 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.nts.gov/pubdms/ . | | |

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.