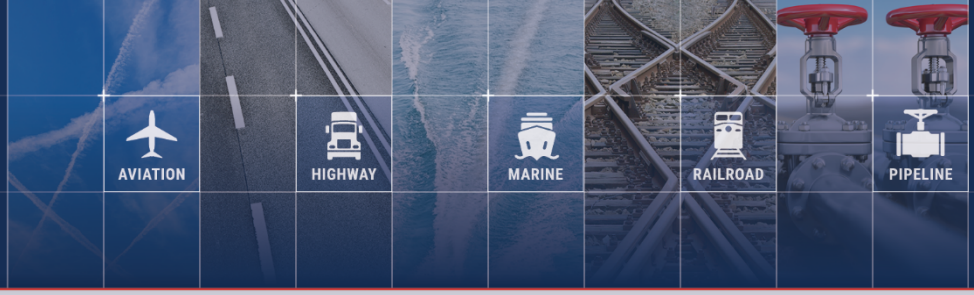

Aviation Investigation Factual Report

Location:	Yeehaw Junction, Florida	**Accident Number:**	MIA02FA173
Date & Time:	September 24, 2002, 14:10 Local	**Registration:**	N106JG
Aircraft:	Piper PA-32R-301T	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Factual Information

HISTORY OF FLIGHT

On September 24, 2002, about 1410 eastern daylight time, a Piper PA-32R-301T, N106JG, registered to and operated by D.A. Decision LLC, had a separation of the right wing, outboard left wing, vertical stabilizer, the stabilator, and impacted the ground near Yeehaw Junction, Florida, while maneuvering through thunderstorms. Instrument meteorological conditions prevailed at the time and an instrument flight rules (IFR) flight plan was filed for the 14 CFR Part 91 personal flight. The airplane was destroyed. The private-rated pilot and one passenger were fatally injured. The flight had originated from Lantana, Florida, at 1330, en route to Orlando, Florida.

At 1257:00, the pilot of N106JG contacted the Saint Petersburg Automated Flight Service Station (AFSS), and requested to file an IFR flight plan from Palm Beach County Airport (LNA), Lantana, Florida direct to Executive Airport (ORL), Orlando, Florida and return. The pilot advised his estimated time of departure was 1400 with time en route of 1 hour 10 minutes. In addition, the pilot requested weather along the route of flight. The specialist reported low levels of precipitation between LNA and ORL with the majority of the weather east of Melbourne, Florida up to and including Daytona Beach, Florida. Thunderstorm activity was reported north of Orlando, Florida.

At 1350:30, the pilot of N106JG contacted the Miami Air Route Traffic Control Center (ZMA) Sector 3 Vero Beach Terminal Radar (R3) controller, and reported level at 7,000 feet. Radar data indicated the airplane's target was approximately 30 miles northwest of LNA. The R3 controller acknowledged the transmission and advised, "Vero Beach altimeter is 29.95" (inches of mercury).

At 1350:50, the pilot requested a 10-degree turn to the left for weather. The R3 controller approved the turn and advised the pilot to "proceed direct BAIRN intersection when able." The pilot acknowledged the transmission. Radar data indicated N106JG's radar track turned 10 degrees to the left. Mode C (transponder) was 7,000 feet.

At 1353:52, radar data indicated N106JG's radar target turned to the right and tracked a course heading of 330 degrees consistent with a heading to the BAIRN intersection. Mode C was 6,900 feet.

At 1358:10, the R3 controller announced on the frequency that Convective SIGMET (Significant Meteorological Advisory) 55E, 56E and 57E were in effect until 1555 and further information could be obtained through Flight Watch, HIWAS (Hazardous In-flight Weather Advisory Service), and Flight Service.

At 1408:44, the pilot of N106JG advised he was in "IMC 7" (instrument metrological conditions at 7,000 feet), and requested a descent, which the R3 controller approved to 5,000 feet. Radar data indicated N106JG's Mode C was 7,100 feet. Thirteen seconds later at 1408:57, the pilot responded, "one oh six juliet gulf the gyro is out." The R3 controller asked the pilot to say again and the pilot responded, "Gyro's out one oh six juliet gulf." The R3 controller instructed the pilot to "descend and maintain 5,000 feet." There was no response from the pilot. Radar data indicated the airplane's Mode C was 7,500 feet and then the radar track began a tight right descending turn. The R3 controller made several more attempts to contact the pilot. No further communications were received. The last radar return was received at 1409:40. Mode C was 900 feet. The supervisor initiated Search and Rescue notification.

Radar data showed that between 1408:44 and 1408:57, the airplane ascended 400 feet. Between 1409:04 and 1409:33 the aircraft descended 4,100 feet, and the last radar return at 1409:40, the airplane had descended 1,300 feet.

PERSONNEL INFORMATION

The pilot, held an FAA private pilot certificate, with airplane single engine land, and airplane instrument, last issued on May 5, 2002, when the airplane instrument rating was added. The pilot held an FAA class 3 medical certificate issued on June 24, 2000, with the limitations the "Holder shall wear corrective lenses." The pilot received a biennial flight review, as required by 14 CFR Part 61, on May 9, 2002.

As per the entries in the pilot's personal flight logbook, he had accumulated a total of 397 total flight hours, 377 total single engine flight hours, and 97 hours in this make and model aircraft. In addition, the logbooks showed that he had 24 total night flight hours, 83 simulated instrument flight hours, and 39 actual instrument flight hours.

AIRCRAFT INFORMATION

The airplane was a Piper Aircraft Inc., model PA32R-301T, serial number 32R-8229059, manufactured in 1982. At the time of the accident the airplane and engine had accumulated 2,813.9 total flight hours. The airplane and engine received an annual inspection on March 21, 2002, 38.2 hours before the accident. The airplane was equipped with one Lycoming model TIO-540-S1AD engine, serial number L-8183-61A, six cylinder, air cooled, direct drive, horizontally opposed, turbocharged, fuel injected, internal combustion engine rated at 300 horsepower at 2700 rpm, and had 953.8 hours since field overhaul. The propeller was manufactured by Hartzell, and was a model HC-E3YR-1RF. According to the maintenance records the last static pressure/instrument check was completed on March 21, 2002. The airplane was equipped with a attitude indicator, horizontal situation indicator (HIS), and a lightning detector (Stormscope).

METEOROLOGICAL INFORMATION

The NTSB Meteorological Factual Report revealed that at the time of the radio transmission to ATC that, "the gyro is out," N106JG was penetrating intense to extreme weather echoes VIP 5 to VIP 6 (Video Integrator Processor ...weather intensity); containing thunderstorms. The thunderstorms contained heavy rain, IMC (instrument metrological conditions), up and downdrafts, horizontal gusts, and turbulence of at least moderate intensity. From about 10 minutes before the accident to the accident time, thunderstorms increased in coverage and intensity, moving into the accident area from the south.

Thunderstorms were noted in Convective SIGMET (Significant Meteorological Advisory) 57E and Miami Center Weather Advisory 201. Both advisories were in effect for the time and area of the accident. The Area Forecast issued at 1345 also forecast thunderstorms for an area that included the accident location. The upper air data from Tampa, Florida, located about 77 nautical miles west of the location of the last radar contact, showed that the freezing level was near 16,000 feet.

Lightning data revealed there were 124 cloud to ground lightning strikes recorded in a 15 statute miles radius of the location of the last radar point of N106JG for the time period 1400 to 1415. The closest cloud to ground strikes to the last radar contact occurred at 1409:15.690. The strike was at 154.8 degrees at 3.6 statute miles. A strike at 148.7 degrees at 3.8 statute miles from the last radar contact occurred at 1409:15.629.

The following are sources of weather information that were valid at the time of the accident:

The 0857 Terminal Forecast 9 for Orlando, Florida: wind 110 degrees at 9 knots; visibility greater than 6 statue miles; rain showers; cloud ceiling 2,500 feet scattered, 8,000 feet broken; 1100-1500 expect visibility 3 statute miles; moderate rain showers; cloud ceiling 2,000 feet broken.

The 0857 Area Forecast 10 for Florida: cloud ceiling 3,000 feet scattered to broken, 10,000 feet broken, cloud tops 25,000 feet; scattered to widely scattered thunderstorms, moderate rain showers, thunderstorm tops to 45,000 feet.

Convective SIGMET 55E valid until 1555: Florida and surrounding coastal waters; from 80 miles southeast of Crestview, Florida; 40 miles west of Cross City, Florida; 100 miles southwest of Cross City, Florida; 130 miles southeast of Crestview, Florida; 80 miles southeast of Crestview, Florida an area of embedded thunderstorms moving from 140 degrees at 25 knots; cloud tops reported above 45,000 feet.

Convective SIGMET 56E valid until 1555: Florida, Georgia and surrounding coastal waters; from 10 miles east northeast of Alma, Georgia; 70 miles east northeast of Jacksonville, Florida; 50 miles east northeast of Ormond Beach, Florida; 50 miles west of Jacksonville, Florida; 10 miles east northeast of Alma, Georgia an area of thunderstorms moving from 160 degrees at 15 knots; cloud tops to 42,000 feet.

Convective SIGMET 57E valid until 1555: Florida and coastal waters; from 30 miles east of Orlando, Florida; 10 miles east of Vero Beach, Florida; 50 miles south southeast of Fort Myers, Florida; 30 miles east of Orlando, Florida an area of developing thunderstorms moving from 140 degrees at 25 knots; cloud tops to 44,000 feet.

WRECKAGE AND IMPACT INFORMATION

The aircraft impacted in an open swamp area, south of Yeehaw Junction, Florida, about 2 miles west of state road 441, and the highway 60 intersection. The aircraft came to rest in a stream, on a heading of 215 degrees. A postimpact fire ensued which destroyed the cockpit and cabin area. The accident occurred during the hours of daylight about 27 degrees, 40.606 minutes north, and 080 degrees, 55.950 minutes west.

The engine and airframe were examined at the site of the accident. The main wreckage was destroyed by fire. The complete right wing, tail section and outboard section of the left wing were found distributed along a debris path on a 150 degrees magnetic heading.

The left wing was found separated at the wing root and was located at the accident site, next to the fuselage. An additional separation of the left wing was observed 87 inches outboard of the wing root. The post impact fire had consumed the inboard section of the left wing. The aft spar attachment was found pulled from the fuselage. The nut and bolt remained attached to the attachment bracket. The forward spar attachment remained attached to the fuselage. The flap was separated from the wing and the postimpact fire had consumed a portion of the flap. The flap position could not be determined. The main landing gear was found in the retracted position. The outboard 110 inches of the left wing was located 4,066 feet, on heading of 329 degrees from the main wreckage. The outboard section of the wing had separated near the splice area. The left wing appeared to have separated upward and aft. Both fracture surfaces of the spar were clean and granular. The aileron had separated from the wing and was not recovered. Both aileron hinges remained attached to the wing structure. Both aileron cables were separated, and the fracture surface displayed a brush/fan type fracture. The aileron bell crank was separated from its attachment points. The outboard and inboard wing fuel tanks were breached and no fuel was observed.

The right wing was found separated at the wing root and was located 1,267 feet, on heading of 319 degrees from the main wreckage. The inboard, forward 84 inches had separated from the main spar and was located 1,373 feet from the main wreckage. The forward spar attachment had separated from the wing root. The aft spar attachment remained attached to the wing; the nut and bolt were attached. The flap remained attached to the inboard hinge only, and displayed impact damage. The flap position could not be determined due to impact damage. The flap connecting rod was found separated at the eyebolt. The main landing gear was found in the extended position and displayed no signs of damage. The outboard 112 inches of leading edge skin was crushed aft about 10 inches. Both fuel tanks were breached, however blue fuel was found in the outboard fuel tank. The upper and lower main spar caps, at the root

separation fracture surfaces, were found clean and granular. The main spar appeared to have separated upward and aft. The main spar, between the root and the outboard section of the inboard fuel tank, was bent into an "S" shape. The aileron remained attached to the wing at both hinges. The aileron connecting rod separated at the eyebolt. The aileron control cables separated, and the fracture surface displayed a brush/fan type fracture. The upper and lower main spar caps appeared to have separated upward and aft. All spar fracture surfaces appeared to be clean and granular.

The tail cone remained partially attached to a portion of the fuselage. The tail cone was flattened to a width of about 18 inches. The vertical fin, the left and right sides of the stabilator were separated and were located 2,700 feet east of the main wreckage. The lower 36 inches of the rudder remained partially attached to the tail cone. The left side of the stabilator main spar was crushed downward at the root. The right side of the stabilator main spar was bent aft and upwards. The connecting rod remained attached to the anti-servo trim tab and the jackscrew showed 4 threads that indicated a neutral trim position. All fracture surfaces appeared to be clean and granular. The vertical fin was bent about 10 degrees to the right and torn at the leading edge, 27 inches down from the rotating beacon. The right side skin was crushed inward and bowed outward on the left side. The 4 rivets that attach the forward spar attachment were found sheared. The aft attachment was separated from the vertical fin. The rudder had separated from the upper hinge and the torque tube remained attached. The rudder balance weight was separated from the upper portion of the rudder. The left side of the rudder bell crank had separated. The right rudder control cable remained attached to the bell crank at the rudder. The other half of the bell crack remained attached to the rear bulkhead, and the left rudder control cable was found attached. The upper and lower control stops for the stabilator appeared to be undamaged. The left side of the separated stabilator was torn and crushed aft along the leading edge for about 44 inches. The upper and lower skin, aft of the main spar, starting at the root and outboard was torn and separated 47 inches aft to the trailing edge. The left stabilator tip remained attached, but displayed some impact damage. The right side of the separated stabilator skin, aft of the main spar was torn and bent downwards about 80 degrees. The tip remained attached. The jackscrew remained attached to the rear bulkhead, and the attachment brackets were deformed to the right and downward. The jackscrew showed four threads, which indicated the anti-servo trim tab was in a neutral position. The jackscrew connecting rod was attached to the jackscrew and a small portion of the anti-servo trim tab. The stinger had separated and was destroyed.

The fuselage was completely destroyed by a postimpact fire and impact with the terrain. No significant information was obtained from the instruments.

Examination of the engine at the crash site revealed that it had come to rest on its right side on the bank of a stream and had sustained fire damage at the rear and left side. The accessories at the rear of the engine had sustained heat damage from the post impact ground fire. There was no visible evidence of catastrophic mechanical malfunction. The engine case at the forward section near the propeller governor and crankshaft flange exhibited two cracks consistent with the absorption of impact energy. The three bladed propeller remained

attached at the crankshaft flange.

The crankcase was found fractured near the lower forward section. The propeller rotated the crankshaft, and continuity was established throughout the gear and valve train. Thumb compression was established at the numbers 2, 4, 5, and 6 cylinders. There was no compression in the numbers 1 and 3 cylinders due to impact damage on the cylinder heads. The oil suction screen was removed and found to be clean and clear of obstructions. The fuel servo was partially separated from the engine and the throttle and mixture settings could not be determined. The vacuum pump had separated from 3 of its 4 mounting studs. The postimpact fire had destroyed the vacuum pump shear shaft. The oil filter was opened and found free of any contamination. The duel magneto had remained attached to the accessory case, and was melted by the post impact fire. The engine examination showed no evidence of discrepancies.

The spark plugs were removed and were brown in color except for numbers 1, 3, and 5, which were found oil soaked. The spark plug electrodes remained mechanically undamaged, and according to the Champion Spark Plugs, Check-A-Plug chart AV-27, displayed coloration consistent with normal operation.

The cylinder combustion chambers were examined through the spark plug holes utilizing a lighted bore scope. The combustion chambers remained mechanically undamaged, and there was no evidence of foreign object ingestion or detonation. The valves were intact and undamaged. There was no evidence of valve to piston face contact observed. The gas path and combustion signatures observed at the spark plugs, combustion chambers and exhaust system components displayed coloration consistent with normal operation. There was no oil residue observed in the exhaust system gas path. The remainder of the engine could not be examined (on-site) due to terrain and equipment limitations.

The propeller governor was securely attached at the mounting pad with the pitch control rod securely attached at the control wheel. The control was situated near the low pitch high rpm stop. The governor was removed for examination, and no discrepancies were observed.

The fuel injection servo mounted at the bottom area of the engine could not be visually seen and/or examined at the site of the accident.

The engine-driven fuel pump situated at the lower rear section of the engine could not be visually seen and/or examined at the site.

The single drive dual magneto remained secure at the mounting pad. The magneto displayed heat damage as a result of the post impact ground fire. The magneto had sustained impact damage that rendered the unit inoperative, and therefore, could not be functionally tested. Magneto to engine timing could not be ascertained.

The turbo-charger mounted at the right side of the engine could not be visually seen or

examined at the site. The exhaust system components that could be examined exhibited gas path coloration consistent with normal operation and exhibited no visible oil residue at the exhaust gas path.

Examination of the vacuum pump at the crash site revealed that it was slightly displaced from the engine at the mounting pad. The fracture surface signatures were consistent with overload. The vacuum pump had been exposed to the ground fire and had sustained heat damage. The hoses connected at each of the vacuum pump fittings had been destroyed by fire; however, the portion clamped onto the fitting was secure. The drive of the vacuum pump was melted, but was intact. The vacuum pump was not opened, and was retained for further examination at the NTSB Materials Laboratory.

On October 24, 2002, a postrecovery examination of the of the engine revealed that the engine and propeller remained attached at the engine crankshaft flange. The engine remained attached to the airframe by partial airframe attachments, and wire cable connections. Impact damage was noted on all sides, damage was more severe on the right side and bottom front areas, to include evidence of post-impact fire damage. No evidence of pre-crash fire damage was noted.

The engine was separated from the airframe for examination purposes. Impact and postimpact fire damage precluded test run consideration. The fluid carrying hoses displayed impact, and post impact fire damage. The engine controls from the cockpit were found bent, broken and distorted. The left side valve covers and top spark plugs were previously removed at the crash site, a bore scope inspection was performed, and no pre-impact discrepancies were observed.

Postrecovery engine examination included partial disassembly. The top spark plugs were re-examined. The right side valve covers were removed and the rear accessory section was removed for inspection. The crankcase displayed an impact fracture at the lower front section. A residual amount of oil remained within the engine. The oil cooler and oil hoses displayed impact, and post impact fire damaged. The oil suction screen was checked, and found clean.

The oil filter element was opened and was free of contamination. The oil pump assembly was checked and found intact when the rear case was removed. The engine crankshaft was rotated utilizing the propeller. Crankshaft rotation established internal gear and valve train continuity.

The gears within the rear accessory section were in place, and secure. The crankshaft gear was also secure. The undamaged cylinder assembly's number 2, 4, 5 and 8, produced compression during rotation. Compression check for numbers 1, 3 and 6 cylinders was not possible due to impact damage of the cylinder heads. The engine examination revealed no evidence of any preimpact discrepancies.

The three propeller blades had remained attached to the engine and displayed impact damage. One prop blade was bent about mid span. The second blade exhibited slight damage and remained straight. The third blade was bent slightly near the outboard section and displayed fire damaged. The spinner assembly was crushed on one side at the area between the two bent propeller blades. The propeller governor remained attached to the engine drive pad. The control arm remained in place and was found in the high pitch position. The control cable displayed impact damaged. The governor displayed exposure to heat from the ground fire. The unit was not removed.

The fuel injector intake manifold assembly displayed impact and fire damage, and was partially separated with the servo from the engine. The controls for throttle and mixture displayed impact damage. Control positions were not determined, due to impact damage. The alternate air door was found closed. The main fuel strainer was not located. The servo inlet screen was found clean. The fuel hoses to the engine were destroyed by impact and post impact fire. No fuel was found remaining within the engine system. The fuel nozzles were not removed.

The engine-driven (geared) fuel pump remained secured and mounted on the rear case. Fire damage was noted. The fuel hoses were destroyed by postimpact fire. The pump drive gear was found intact when the accessory case was opened.

The dual magneto remained attached to the case. The unit was damaged, and partially melted by post impact fire. The harness was destroyed. The drive gear was found intact when the accessory case was opened.

The top spark plugs were examined and exhibited medium brown color combustion deposits. The electrode wear was moderate to advanced, gap settings were normal, and plugs number 1, 3, 5 and 8 were oil soaked.

The turbocharger, and turbo system components displayed impact, and postimpact fire damage. The major components remained mounted to the airframe structure, and were removed for examination. The intercooler assembly and induction manifold displayed impact damage. The turbocharger compressor was impacted with soil. The tail pipe was removed, and the turbine was inspected. The turbine wheel was intact. The turbo charger would not rotate due to impact damage. The exhaust bypass valve was found in the open position. The pressure relief valve was destroyed by fire.

The alternator was found fractured from the mount and partially attached by the bell adjustment bracket. The unit was removed for examination. No preimpact discrepancies were found.

TEST AND RESEARCH

The NTSB Systems Group Chairman's Factual Report revealed that the following components

were examined: airspeed indicator, altimeter, attitude indicator, compass, directional gyroscope from horizontal situation indicator (HIS), lightning detector, unidentified (burned and crushed) case from an electronic display, vacuum pump and vertical speed indicator.

Examination of the airspeed indicator revealed that the general features included molten aluminum debris around the edges of the face and the casing had been partially molten. The pitot tube T-shaped connector was not projecting straight forward from the case, as originally installed, the tube was oriented 42 degrees toward the lower right from the bottom of the instrument case, when looking from the end of the original tube's orientation. Melt-lines (sagging) on the instrument case appeared to be oriented to nearly the same angle and the impression of a square object was cast into the side of the case at that orientation. The airspeed indicator needle was oriented toward the 12 o'clock position. Examination of similar airspeed indicators showed that this was the resting orientation for the needle.

Examination of the altimeter revealed about half of the facial glass of the altimeter remained with the instrument and was blackened. The needle depicting the ten thousand foot scale covered a heat shadow on material behind the needle; at the first mark less than the "0" (vertical-up) marking. Following removal of the glass, the hundred and thousand foot needles were found fixed in place, with heat shadows on the surrounding materials. The displayed positions of the thousand and hundred foot needles was about 7,350 feet, however, the position of the thousand-foot needle did not correspond with the position of the ten thousand foot needle. The barometric scales were illegible.

The examination of the attitude indicator only depicted the orientation found at the laboratory. No information was available to determine whether the pitch limit of the gyroscope was reached before attitude control of the airplane was lost. The aluminum casing was relatively intact, but the forward portion of the can and internal frame were partially molten. The case had been flattened sufficiently to hold the positions of the roll display components. The facial surfaces were flame damaged and the paint markings were missing, except under the edge of the roll depiction ring. The movable pitch position mask (referred to as the "football," due to the shape) was found pinned at the top of the display, at the furthest "nose down" attitude. Referring to photographs and attitude indicators of similar construction, the maximum nose-down pitch marking on the football-shaped mask was 20 degrees. The football was held in that position by the crushed roll depiction ring. The arm that carried the football was found to be damaged in the full "nose down" display attitude. The sliding pivot in the arm was damaged at this orientation where the case of the gyroscope damage attached. The gyroscope case was found at a similar attitude, near the wire stop that limited travel. Using the autopilot data source as a reference for the bottom of the instrument, an 83-degree left roll measurement was made from the rotating yoke that carries the gyroscope and display portions of the instrument. The remaining brown and blue facial paint on the face of the display corresponded with this roll attitude.

In roll, a bend in the roll shaft was found to have been the source of contact between the instrument mechanism and the case. The roll display was found locked firmly in place.

The gyroscope case was removed from the instrument, the cap removed, and the rotor bearings were found free to rotate. The rotor was removed and the case was sectioned for examination of the internal walls. Scratch-marks in the plane of rotation were found on the rotor, as well as on the cap and the walls of the gyroscope case.

The HIS (Horizon Situation Indicator) was found to have been burned, but the general features of the instrument remained. The base of the heading (HDG) flag was visible at the upper right and oriented toward the instrument face. The mounting position of the navigation (NAV) flag contained fire debris. The glide slope (GS) needle was not seen. The course deviation indicator (CDI) needle in the middle of the display was rotated, with the head of the needle at about 125 degrees to the left. The needle was about 1/3 of the distance from the center of the scale, toward the right (if viewed with needle head-up), denoting a position to the left of course.

The sheet metal case was cut away, and within the exterior housing, the gyroscope assembly was partially molten. The compass rose was oriented so that the scale closest to the display end of the instrument read approximately 160 to 170 degrees.

The case of the gyroscope and the mounting yoke were cut for removal from the instrument, the cap removed, and the rotor bearings were found free to rotate. The rotor was removed and the case was sectioned for examination of the internal walls. Scratch-marks in the plan of rotation were found on the cap. Debris was found at the edges of balance holes in the rotor periphery. The internal walls of the aluminum case had partially molten and no fine features remained.

An electronic lightning strike display (Stormscope) was found mounted to the right of the vertical speed indicator. With reference to a photo from an intact instrument, the left knob was fixed at the FWD position (of OFF, ON, FWD) and the right knob was fixed at the 50 nautical mile range.

The case of the vertical speed indicator was extensively fire damaged and the face was almost entirely blackened. The indicator needle was found near the orientation of an approximate 500-foot per minute climb.

The external examination of the vacuum pump revealed that other than a fractured mounting flange, the external features of the vacuum pump were generally intact. The pump features were blackened and heat damaged. The exterior rings were a gold anodize in color, with some sooting and darkening of the general features. The production color was red and heat samples were taken of similar rings. The rings turned the same color when heated to more than 750 degrees Fahrenheit for more than 30 minutes. At greater than 1,000 degrees, the sample parts turned gray, then blackened. Loose black chips of flat carbon-like flakes dropped out of the inlet and output tubes and the three main sections of the housing moved independently with finger pressure. The bolt heads had no torque putty and the flats of the bolts did not appear to be deformed or different than the surrounding blackened area. The

lower casing was marked 6/10/6 that identified the casting material from 1996. The housing was marked with CC, which denoted a counter-clockwise rotation of the engine drive pad. The inlet pipe at the top of the pump had an approximate 0.5-inch wide dent that was located about an inch from the end of the pipe. The mounting flange was broken, and about half was missing. The single remaining bolt hole had been slightly elongated and thread marks were visible. The surrounding area was black and sooted and the general surface of the fracture was filled with black soot or similar material. The driven coupling was in the pump and the fingers were distorted and heat damaged. Resolidified resin was bridging the coupling and the bore of the housing. There was a significant amount of carbon deposited in this general area. The remaining portion of the drive (engine-side) coupling was about 2 inches long and had significant burn damage. The tip of the shaft from the engine end was missing and appeared very fibrous, with no resin matrix. The fingers were distorted and heat damaged, but all existed.

The internal examination of the vacuum pump revealed almost no torque was required to remove the steel case bolts from the aluminum housing. The inside of the case was lightly corroded in spots. Along the periphery were light wear or scoring type of marks in the direction of rotation and the marks were beneath a layer of surface dirt. Once opened, the block appeared to be complete, but was found broken into pieces. The fractures between the pieces did not have a polished appearance. No ground pieces of the block or vanes were found in the pump air passages. The separated sections were almost evenly distributed and not all offset to one side. A fragment of red rubber was found from one of the drive pins and the broken edges of the rubber had been blackened. The single fragment had been dislodged to the edge of the drive pinhole, but had not been ground into numerous smaller pieces. The three pins that drove the internal block were solidly fixed to the plate that was attached to the driven coupling. Application of light finger pressure did not move or rock the driven coupling plate. The red rubber on each of the three drive fingers for the block was split. On two fingers, the split was on the backside from the direction of rotation, and on the third, the split was toward the centerline of the pump. The edges of the split rubber pins were blackened. The vanes and corresponding slots were numbered in sequence, with an arbitrary starting point. A yellowish smudge was on the end of the block, near the root of vane #5. Edge chips were missing from the trailing edges of slots #3, #4, and #6. The six vanes were present and generally intact, with only chips broken at the corners. The inboard edges of the vanes were sooted and no paint was visible.

According to the transcript of communications the specialist at the Saint Petersburg AFSS did not provide the pilot of N106JG with forecasted adverse weather conditions as required by FAA Order 7110.65, paragraph 3-2-1.

According to the NTSB ATC Group Chairman's Factual Report, ARTCC radar systems have the capability to display areas of weather that are associated with rain or moisture. The system provides the controller with two distinct levels of weather intensity by assigning symbols for specific precipitation densities measured by the system. The intensity of the weather displayed is based on the density of the precipitation. Areas of high-density precipitation are represented

by "H " symbols and "L" or radial lines indicate lower density precipitation.

At the time of the accident the R3 controller was receiving on-the-job training instruction. This type of training is conducted during live traffic operations and by a qualified controller certified to provide ATC instruction. The R3 controller and instructor were on position at the Sector 3 workstation about 30 minutes prior to the accident.

The National Weather Service issued SIGMET 55E, 56E and 57E at 1355. The R3 controller received the information and issued a HIWAS (Hazardous In-flight Weather Advisory Service) alert message on his frequency at 1358:10 as required.

A review of the recorded voice communications indicated the pilot reported on the R3 controller's frequency about 8 minutes prior to the broadcast. The last transmission received from the pilot was about 10 minutes after the broadcast. The pilot had sufficient time to contact Flight Watch or a Flight Service frequency for additional information. According to the FAA there were no reports of any contacts made by the pilot of N106JG to Flight Watch or any Flight Service frequency before or after the HIWAS alert message was broadcast.

About 20 minutes later the pilot stated he encountered IMC conditions and requested a descent, which the controller approved. The R3 controller approved the deviations, but he did not advise the pilot of actual weather areas observed on his radar display as required. Radar data indicated isolated returns of light and heavy precipitation were displayed throughout the vicinity of N106JG's flight path.

A review of the console records from the R3 controller's workstation indicated the filter keys to display weather were selected to show both low and high weather returns. Based on this and the radar data, N106JG encountered some level of weather along his route of flight and that the areas of weather were displayed on the R3 controller's radar display. There is no evidence to indicate that the R3 controller advised the pilot of N106JG of the pertinent information on observed weather areas, or that the instructor ensured it was accomplished.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot, at the Office of the Chief Medical Examiner, Orlando, Florida, on September 25, 2002. According to the autopsy report the cause of death was "...Craniocerebral blunt force trauma and third degree body burns...." No significant pre-existing disease was noted on the autopsy.

Toxicological tests were conducted at the Federal Aviation Administration, Research Laboratory, Oklahoma City, Oklahoma, and revealed, "No ethanol or drugs were detected "

ADDITIONAL INFORMATION

The airplane was released to Mr. William J. Blankinship, Sample International Aviation Inc., on

behalf of owner's Insurance Company on October 24, 2002. The airspeed indicator, altimeter, attitude indicator, compass, directional gyroscope from horizontal situation indicator (HIS), lightning detector, unidentified (burned and crushed) case from an electronic display, vacuum pump and vertical speed indicator, were released by the System's Group Chairman, to Mr. Mark A. Sylvester, attorney for Leesfield, Leighton, Rubio, Mahfood, and Boyers, representing the owner's estate, on February 18, 2004.

Pilot Information

Certificate:	Private	**Age:**	38,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
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:**	July 24, 2000
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 9, 2002
Flight Time:	397 hours (Total, all aircraft), 97 hours (Total, this make and model), 219 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N106JG
Model/Series:	PA-32R-301T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-8229059
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 21, 2002 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	38.2 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2813.9 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	TIO-540-S1AD
Registered Owner:	D.A. Decision LLC	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KVRB,24 ft msl	**Distance from Accident Site:**	31 Nautical Miles
Observation Time:	13:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Scattered / 20000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.92 inches Hg	**Temperature/Dew Point:**	29°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lantana, FL (LNA)	**Type of Flight Plan Filed:**	IFR
Destination:	Orlando, FL (ORL)	**Type of Clearance:**	IFR
Departure Time:	13:30 Local	**Type of Airspace:**	Class B

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	27.666666,-80.916664

Administrative Information

Investigator In Charge (IIC):	Yurman, Alan
Additional Participating Persons:	John M Murphy; FAA; Orlando, FL Paul Lehman; Piper; Vero Beach, FL Mark W Platt; Lycoming; Van Nuys, CA Dan Scholz; Parker Hannifin Corporation; Elyria, OH
Report Date:	May 6, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55770