Aviation Investigation Final Report

Location:	Morgantown, West Virginia	**Accident Number:**	ERA12FA409
Date & Time:	June 22, 2012, 10:01 Local	**Registration:**	N508GT
Aircraft:	RAYTHEON AIRCRAFT COMPANY C90GT	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The airplane climbed to 3,100 feet mean sea level (msl) on an approximate direct heading for the destination airport. When the airplane was about 9 miles east of the airport, the air traffic controller advised the pilot that he had "radar contact," verified the altitude of 3,100 feet msl, and instructed him to maintain visual flight rules (VFR). The airplane then descended to 3,000 feet msl, and, about 1 minute later, struck a communications tower with an overall height of about 3,089 feet msl.

Examination of the airplane and engines revealed no evidence of any preimpact malfunction or failure that would have precluded normal operation. Review of the airplane's flight route indicated that the pilot had chosen a direct flight route near rising terrain and obstructions within a designated mountainous area at his selected cruise altitude of 3,100 feet msl, which was below the published maximum elevation figure of 3,500 feet msl depicted on the VFR sectional chart for the area. The pilot should have taken into account terrain elevation, obstructions, and weather when planning his route. If he had chosen a route that avoided obstructions and terrain and planned to fly at a higher altitude, he may have been able to safely complete the short flight.

The airplane was equipped with a cockpit voice recorder (CVR) and an enhanced ground proximity warning system (EGPWS). The EGPWS had a terrain inhibit switch, which, when engaged by the pilot, inhibits all EGPWS visual and aural alerts and warnings to allow aircraft to operate without nuisance or unwanted warnings. However, the pilot's guide cautioned that the terrain inhibit switch should "NOT" be engaged for normal operations. CVR and EGPWS data revealed that the terrain inhibit switch was engaged before departure. As a result, although the EGPWS calculated an obstacle alert for terrain 3 minutes after takeoff, the alert was not annunciated. Review of previous flights revealed that the pilot routinely engaged the terrain inhibit switch while flying into the departure airport for this flight and would then disengage it after departure. This indicated that the pilot's normal habit was to disengage the terrain inhibit switch after departure, but, on this flight, his normal habit pattern may have been interrupted, he may have become distracted, or he may have simply forgotten to shut it off. Regardless,

aeronautical charts found on board the airplane depicted the tower hazard, so the pilot should have had some awareness of the tower's presence.

As noted previously, the controller identified the airplane and verified the observed and reported altitude. At the time that the airplane was identified, it was about 3.8 miles from the communications tower and its altitude was indicating that its trajectory was below the top of the tower. The tower's location was depicted on the controller's radar map as an obstruction to flight. Under the circumstances, the controller should have been aware that the airplane was flying 400 feet below the highest obstruction in the area and was nearing the tower, and he should have provided the pilot with a safety alert about the proximity of the antenna. Although the controller had other traffic, his workload at the time was not excessive. Although the weather conditions at the destination airport were conducive to landing under VFR, the pilot would have encountered reduced visibility and possibly instrument meteorological conditions east of the airport around the area of the accident due to haze and cumuliform-type clouds from 1,500 to 3,000 feet above ground level, which may have affected his ability to see the tower.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's inadequate preflight route planning and in-flight route and altitude selection, which resulted in an in-flight collision with a communications tower in possible instrument meteorological conditions. Contributing to the accident were the pilot's improper use of the enhanced ground proximity warning system's terrain inhibit switch and the air traffic controller's failure to issue a safety alert regarding the proximity of the tower.

Findings

Personnel issues	Flight planning/navigation - Pilot
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Use of equip/system - Pilot
Personnel issues	Decision making/judgment - ATC personnel
Environmental issues	Obscuration - Contributed to outcome

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Enroute	Controlled flight into terr/obj (CFIT) (Defining event)

HISTORY OF FLIGHT

On June 22, 2012, at 1001 eastern daylight time a Raytheon Aircraft Company, C90GT, N508GT, operated by Oz Gas Aviation LLC, was substantially damaged when it struck a communications tower near Morgantown, West Virginia. The certificated airline transport pilot was fatally injured. No flight plan had been filed for the positioning flight from Nemacolin Airport (PA88), Farmington, Pennsylvania, to Morgantown Municipal Airport (MGW), Morgantown, West Virginia conducted under Title14 Code of Federal Regulations (CFR) Part 91.

At 0924 on the morning of the accident, the airplane departed from Rigrtona Airport (13PA), Tidioute, Pennsylvania for PA88 with the pilot and three passengers onboard. The airplane landed on runway 23 at PA88 at 0944. The pilot then parked the airplane; shutdown both engines, and deplaned the three passengers. He advised them that he would be back on the following day to pick them up. After the passengers got on a shuttle bus for the Nemacolin Woodlands Resort, the pilot started the engines. He idled for approximately 2 minutes, and then back taxied on runway 23 for takeoff. At 0957, he departed from runway 23 for the approximately 19 nautical mile positioning flight to MGW, where he was going to refuel and spend the night.

After departure from PA88, the airplane climbed to 3,100 feet above mean sea level (msl) on an approximately direct heading for MGW. The pilot then contacted Clarksburg Approach Control and was given a discrete code of 0130. When the airplane was approximately nine miles east of the Morgantown airport, the air traffic controller advised the pilot that he had "radar contact" with him. The airplane then descended to 3,000 feet, and approximately one minute later struck the communications tower on an approximate magnetic heading of 240 degrees.

According to a witness who was cutting timber across the road from where the accident occurred; the weather was cloudy with lighting and thunder, and it had just started "sprinkling". He then heard a loud "bang", turned, and observed the airplane descending upside down, and then impact. About 20 minutes later it stopped "sprinkling". He advised that he could still see the top of the tower when it was "sprinkling".

PERSONNEL INFORMATION

The pilot was self-employed and flew and managed the airplane for Oz Gas Aviation LLC. He also flew for a training organization that provided ground and flight instruction in customer's airplanes.

According to Federal Aviation Administration (FAA) records, the pilot held an airline transport pilot certificate with ratings for airplane single-engine land and airplane multi-engine land, and type ratings for the CE-500, DA-10, IA-JET, LR-JET, N-265, and CE-525S. He also held commercial privileges for rotorcraft-helicopter, and instrument helicopter, and a flight instructor certificate with ratings for airplane single-engine, airplane multi-engine, rotorcraft-helicopter, instrument airplane, and instrument helicopter.

He held a special issuance FAA second-class medical certificate which was issued on August 1, 2011 and was not valid for any class of certificate after August 31, 2012. Review of FAA and pilot records revealed that the pilot had reported to the FAA during the application of his special issuance medical certificate that he had accrued 22,000 total hours of flight experience, 150 hours of which were in the previous 6 months. He had completed C90GT initial training on February 4, 2008, and C90GT recurrent training on February 9, 2009. No other records of training, or record of completion of an FAA flight review within the two years preceding the accident were discovered during the course of the investigation.

AIRCRAFT INFORMATION

The accident aircraft was a low wing, pressurized, twin engine airplane, of conventional metal construction equipped with retractable landing gear. It was powered by two Pratt & Whitney Canada PT6A-135A turbopropeller engines capable of producing 550 shaft horsepower, each equipped with a Hartzell 4-bladed, fully reversing, constant speed propeller. It could cruise at 270 knots true airspeed and could operate at altitudes up to 30,000 feet. Its range with full fuel was 1,068 nautical miles.

According to FAA and maintenance records, the airplane was manufactured in 2006. The airplane's most recent phase inspection was completed on May 11, 2011. At the time of the inspection the airplane had accrued 1,305 hours of operation.

At the time of the accident the airplane had accrued 1439.2 hours of operation and was overdue for its next phase inspection.

METEOROLOGICAL INFORMATION

Destination Weather

The reported weather at MGW at 0953, included: winds 220 degrees at 5 knots, 9 miles visibility, a few clouds at 1,700 feet, temperature 24 degrees C, dew point 20 degrees C, and an altimeter setting of 29.95 inches of mercury.

There were clouds around 1,500 to 2,000 feet above ground level (agl) with a slight reduction in visibility due to haze. With the haze that was present there was likely more reduced visibility in the horizontal direction than the vertical direction and though 9 miles visibility was reported, it was likely slightly less than that, looking up or down at an angle, but nothing below 7 miles visibility. The clouds would have likely been most prominent near the mountainous terrain given the weather in the Mid-Atlantic region, and mountain and valley breeze circulations present during the morning hours.

Accident Area

From 0900 to 1100, there was an increase in mid- level clouds as satellite images of the area taken at 0945, 1045, and 1145 showed an increase in cloud cover, indicating that the pilot would have had reduced visibility and possibly instrument meteorological conditions from clouds at 1,500 to 3,000 feet agl.

A witness statement also indicated that light rain and thunder was present at the time of the accident, and review of a photograph taken of the communications tower at 1130, revealed the presence of cumulus clouds in close proximity to the top of the communications tower.

FLIGHT RECORDERS

Per federal regulation, because the aircraft was certificated to be operated by one pilot, it was not required to be equipped with a cockpit voice recorder (CVR). The aircraft, however, was equipped with a solid-state CVR that recorded the last 30 minutes of aircraft operation; this was accomplished by recording over the oldest audio data. When a CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation. This model CVR, the L-3/Fairchild FA2100-1010, recorded 30 minutes of digital audio, which was stored in solid-state memory modules. Four channels of audio information were retained: one channel for each flight crew and one channel for the cockpit area microphone (CAM).

The CVR had sustained only minor physical damage. The audio information was extracted from the recorder normally, without difficulty.

The recording consisted of two channels of audio information. One of the channels contained audio information from the pilot's audio panel. The quality of this channel was good. One channel contained audio information from the CAM. The quality of this channel was also good. The third and fourth channel did not contain audio, nor was it required by regulation to do so. The quality of these channels was unknown.

The following is a summary of the recorded audio information:

At 9:24:28.7, recording started.

At 9:25:00.3, the airplane was in a VFR climb to 8,000 feet msl, destined for PA88 talking to Cleveland Air Route Traffic Control Center (ARTCC).

At 9:26:48.4, the pilot can be heard talking to a male passenger about the destination.

At 9:27:28.9, the pilot advises Cleveland ARTCC that he was descending to 6,000 feet msl.

At 9:27:51.5, unintelligible background conversation of passenger can be heard during most of the flight.

At 9:28:09.6, the pilot contacted the Johnstown approach controller.

At 9:38:29.8, the pilot advised Johnstown approach that he was descending to 4,500 feet.

At 9:40:38.2, Johnstown approach advised the pilot that that the airport was at 12 o'clock and 10 miles. Pilot advised the airport was in sight and canceled flight following.

At 9:40:57.8, the pilot made a radio call to Nemacolin traffic that he was landing on runway 23.

At 9:43:14.8, the sound of a radio altimeter aural call of "five hundred feet" was recorded.

At 9:43:21.8, a passenger makes a comment to the pilot that "he didn't hear any terrain warning alert" pilot's response was that he "turned it off".

At 9:44:00.0, the sound of touchdown was recorded.

At 9:45:01.5, the engines were shutdown.

At 9:45:13.0, electrical power was removed from the CVR.

At 9:50:58.5, recording started again.

At 9:51:04.1, sound of first engine start was recorded.

At 9:51:47.3, sound of second engine start was recorded.

At 9:55:25.3, the pilot made a radio call to Nemacolin traffic that he was back taxiing on runway 23 for takeoff.

At 9:57:07.1, sound of increasing engine noise was recorded.

At 9:57:29.1, sound similar to a gear retract motor was recorded.

At 9:57:48.5, sound of altitude alert was recorded.

At 9:58:35.7, the pilot attempted to contact Morgantown approach.

At 9:59:01.8, the pilot contacted Morgantown again.

At 9:59:06.9, Clarksburg approach answered.

At 9:59:11.5, the pilot reported his position as 14 miles to the northeast landing Morgantown.

At 9:59:58.2, Clarksburg approach reported that he had radar contact nine miles east of the Morgantown airport at 3,100 instructed pilot to maintain VFR and to expect runway 18 and advise you have the Morgantown weather.

At 10:00:20.5, sound of altitude alert tone was recorded.

At 10:00:27.7, sound of Morgantown automated weather broadcast starts and continues until the end of the recording.

At 10:01:00.1, sound of first impact was recorded.

At 10:01:01.9, recording ended.

WRECKAGE AND IMPACT INFORMATION

Examination of the Accident Site

Examination of the accident site revealed that the airplane made first contact with the antenna with the spinner for the right engine's propeller. The right wing then broke apart, and impacted .1 miles from the communications tower where portions of the fragmented wing were then consumed by a post impact fire.

The left horizontal stabilizer separated from its mounting location, and impacted in the woods adjacent to the communications tower.

The left engine separated from its mounting location and impacted approximately .2 miles from the communications tower. The fuselage and left wing impacted inverted approximately .3 miles from the communications tower.

The right engine impacted .5 mile from the communications tower.

In all, hundreds of pieces of the airplane were spread over the area with the majority of the pieces situated along a .5 mile wide wreckage path which started at the communications tower site and continued to the right engine on a 244 degree magnetic heading.

Examination of the Communications Tower

Examination of the communications tower revealed that it was located approximately 7.9 nautical miles northeast of MGW, and it was the highest obstruction in the area.

The antenna site was approximately 2,596 feet above mean sea level. The tower's overall height above ground level was approximately 493 feet, and the tower's overall height above mean sea level was approximately 3,089 feet.

It was marked and lighted in accordance with Federal Communications Commission requirements under Title 47 CFR Part 17, Paragraphs 1, 3, 4, 13, and 21.

The airplane struck the communications tower's antenna which then separated in to three large sections which fell from the top of the tower, along with multiple smaller fragments and debris.

One section which included the beacon light and digital antenna fell through the roof of the broadcasting building which contained the equipment for operation of the communications tower and was adjacent to the antenna site.

The other two sections fell to the ground, coming to rest approximately 244 feet southwest of the base of the tower structure with the end of one portion buried in the ground.

Examination of the antenna revealed that the antenna exhibited deformation, impact damage, and black scuff marks.

Examination of the history of the communications tower also revealed that it had also been struck previously by an aircraft approximately 9 years before, when on May 21, 2003, when a Piper PA-28-180 being operated on a visual flight rules (VFR) cross country flight (NYC03FA113), struck the top guy wire of the communications tower, mid-span between the top of the tower, and its ground anchor. As the airplane fell to the ground it struck a 12,000 volt power line. A postcrash fire resulted. The pilot who was fatally injured in the accident had received a weather briefing which included ceilings between 1,300 feet and 1,500 feet, and mountain obscurement. Power company personnel who responded to the power outage reported that the top of the mountain was obscured in fog.

Examination of the Wreckage

Examination of the wreckage revealed no evidence of any preimpact malfunctions or failures of the flight controls, engines, or airplane that would have precluded normal operation.

With the exception of the aft fuselage, vertical stabilizer, and left wing, the rest of the airplane had been fragmented with the majority of the pieces displaying crush, compression, and impact damage.

The left engine displayed impact and buckling damage to the gas generator case. The exhaust duct displayed torsional bending. The compressor turbine vane, shroud, and power turbine vane baffle displayed circumferential wear. The propeller pitch lever was in feather (fail safe mode), and the propeller pitch lever cable was fractured.

The right engine displayed compression, buckling, and distortion damage of the exhaust duct and gas generator case. The propeller shaft was sheared. The compressor stator vanes were bent and displaced, and the power turbine blades were fractured.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the State of West Virginia, Office of the Chief Medical Examiner. Cause of death was catastrophic injuries.

Toxicological testing of the pilot was conducted at the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The specimens were negative for carbon monoxide, cyanide, basic, acidic, and neutral drugs, with the exception of:

- Amlodipine, which is a prescription medicine, calcium channel blocker used to treat high blood pressure and angina, and was detected in Urine and Liver.

- Glucose, which is a blood sugar, is indicative of diabetes, and was detected in Urine, but not detected in Vitreous.

- Pioglitazone, which is an oral antidiabetic agent that acts primarily by increasing uptake of glucose by peripheral organs and decreasing glucose production by the liver. It is used in the management of type 2 diabetes mellitus, and was detected in Urine and Liver.

- Salicylate, which is an over the counter analgesic used in the treatment of mild pain, and was detected in Urine.

Review of FAA records revealed that the pilot had a history of coronary artery disease with a stent, diabetes treated with oral and injectable medications, high blood pressure treated with medication, and a history of stroke with no residual neurological symptoms.

No other significant issues were identified on his last physical examination by an airman medical examiner (AME). The pilot had no recent changes in his cardiac history. He had not significantly modified his medications since his physical examination, and had no recent changes in his vision.

Review of toxicological testing revealed that all medications detected during the testing, had previously been reported to his AME by the pilot.

TESTS AND RESEARCH

Charting and Obstructions

Review of the airplane's route of flight revealed that the pilot had selected a direct route of flight which brought him into proximity of rising terrain and obstructions within a Designated Mountainous Area (DMA), at his selected cruise altitude of 3,100 feet msl.

Review of the Cincinnati Sectional Aeronautical Chart revealed that the quadrangle bounded by the ticked lines of latitude and longitude surrounding the accident site contained a maximum elevation figure (MEF) of 3,500 feet. The MEF was based on information concerning the highest known feature in the quadrangle, including terrain and obstructions (trees, towers, antennas, etc.).

Review of the L29 instrument flight rules (IFR) Enroute Low Altitude Chart revealed that the quadrangle bounded by the ticked lines of latitude and longitude surrounding the accident site contained an Off Route Clearance Obstruction Altitude (ORCOA) of 7,100 feet msl. The OROCA represented the highest possible elevation including both terrain and other vertical obstructions (towers, trees, etc.) bounded by the ticked lines of latitude and longitude. The OROCA was determined just as the MEF was on the Cincinnati Sectional Aeronautical Chart except that it provided a 2,000 foot vertical buffer inside the DMA. Unlike the MEF, The OROCA was also determined by analyzing a 4 nautical mile area around the quadrangle for obstructions. This would provide a chart user the same lateral clearance an airway would provide should a line of intended flight follow a ticked line of latitude or longitude.

Onboard Aeronautical Charts

During the examination of the wreckage a search for aeronautical charts was conducted. The search of the wreckage revealed that the airplane did have multiple aeronautical charts onboard, however further examination revealed that they were approximately 2 years out of date. However, despite the age, these charts depicted the tower hazard.

During this search two tablet computers were discovered in the wreckage which were functionally capable of supporting applications for electronic flight bags, flight planning and filing, aviation weather depiction, and electronic flight charts. Examination of the tablets revealed that they had sustained significant impact damage and it could not be determined if either tablet was in operation and being used by the pilot at the time of the accident. Attempts to recover data that may have been stored in the tablets non-volatile memory also were unsuccessful.

A search of electronic flight planning and flight support providers revealed that the pilot however, had a current subscription with a flight planning and flight support provider, and had downloaded the most current revision of the provider's software. During the download the pilot had the option of downloading sectional aeronautical charts, terminal area charts, IFR enroute low altitude charts, and IFR enroute high altitude charts. However, it could not be determined what charts the pilot may have downloaded, as the provider's system did not track that information.

Enhanced Ground Proximity Warning System

The airplane was equipped with a Bendix/King KMH880, traffic advisory and multi hazard awareness system which provided an enhanced ground proximity warning system (EGPWS) function which provided terrain display, terrain alerting and warning, and obstacle alerting and warning to the pilot.

The system used data from an internal global positioning system (GPS) receiver, a proprietary world-wide terrain database, obstacle database, and runway database, as well as uncorrected pressure inputs from the airplane's transponder, and outside air temperature probe.

The KMH880 pilots guide outlined the basic requirements for system operation and recommended procedures for its use. The terrain database, runway database, and alerting/warning functionality were contained in the EGPWS computer and required no pilot action for system operation.

Outputs generated by the system were:

· Terrain/Obstacle Display

· Voice Alerts/Warnings/Callouts

· Visual Alerts/Warnings

During normal flight operations, the system would remain essentially silent, using GPS, altitude, and temperature data in combination with database information to provide the pilot with a display of the airplane's position relative to the surrounding terrain and known obstacles, thereby providing situational awareness for the pilot.

Should an airplane fly into danger where a conflict with terrain or a known obstacle was imminent, the system would provide both visual and aural alerts and warnings to the pilot. The system would also provide alerts and warnings for excessive rates of descent and inadvertent descents or altitude loss after take-off.

According to the KMH880 Pilot's Guide, prior to flight the system should be tested for proper operation. Normally, this is done by the pilot during the "BEFORE TAKE-OFF" check. All aircraft power and systems should be up and running, and the EGPWS "Not Available" annunciator lamp should be off.

Terrain Inhibit Switch

A "Terrain Inhibit" switch was required as part of the EGPWS system. When engaged by the pilot, the switch would inhibit all "visual and aural alerts and warnings" associated with the EGPWS system. Also

an external annunciator lamp would be illuminated and a status message would be displayed indicating "Warnings Inhibited".

According to the EGPWS pilot's guide, the purpose of the "Terrain Inhibit" switch was to allow aircraft to operate without nuisance or unwanted warnings at airports that are not in the system database such as private airports or those with runways shorter than 2,000 feet. Additionally, there may be some visual flight rules (VFR) only airports where unique terrain features are in close proximity to the runway, and the "Terrain Inhibit" switch may be used when operating in good VFR conditions. However, the pilot's guide cautioned that the "Terrain Inhibit" switch should "NOT" be engaged for normal operations.

Review of EGPWS Stored Data

The EGPWS maintained a flight log which was representative of flights since the unit was first installed and powered up. It was activated every takeoff. Memory size limited the amount of stored information. Terrain inhibit data was available for flights 878 through 1261. Data for alerts was available for flights 605 through 1261. As part of this investigation, this data was downloaded from the EGPWS.

Review of the data downloaded from the EGPWS revealed that the database was the one originally delivered with the unit; it had never been updated, and was out of date.

Further review revealed that flight 1261 was the accident flight. The airport from which the aircraft departed prior to the accident was listed in the EGPWS data base as PA88. The accident flight was the only flight out of PA88 in the more than 375 flights that were stored in the unit's data base.

According to the stored data, the terrain inhibit was turned on 20 seconds prior to landing at PA88 and remained on for takeoff on flight 1261. Approximately three minutes after takeoff from PA88 with the terrain inhibit switch still on, the EGPWS calculated an obstacle alert for terrain, however the alert was not annunciated with the terrain inhibit switch on. This was the last data stored on the unit.

Review of previous flights also revealed that the airplane routinely flew into 13PA and it was not included in the EGPWS data base. The stored data indicated that terrain inhibit was routinely selected when the airplane was flying into this airport, usually after a terrain alert caused by landing at an airport that was not in the database. Terrain inhibit would then be deselected after departure.

Air Traffic Control Voice and Radar Data

Review of air traffic control (ATC) voice and radar data, revealed that the airplane was first detected by radar on a 1200 transponder code at 0958:55, 3 miles southwest of PA88 while it was climbing out. The pilot contacted Clarksburg approach at 0959:22 to obtain radar services. After controller acknowledgement of his call, at 0959:31 the pilot stated, "uh Clarksburg uh 508GT's 14 miles to the uh northeast landing Morgantown". After obtaining the airplane's type from the pilot, at 0959:53 the controller issued transponder code 0130 and the pilot acknowledged. The airplane's transponder code changed from 1200 to 0130 at 1000:06 while the airplane was continuing straight ahead at an indicated altitude of about 3,000 feet msl. and a ground speed of approximately 217 knots. At 1000:19, the controller transmitted, "King Air 508GT you're radar contact niner miles east of Morgantown Airport, 3,100, maintain VFR, expect runway 18, advise when you have the weather." At 1000:28, the pilot responded, "uh roger we're getting it." The airplane was approximately 3.8 nautical miles (62 seconds) northeast of the antenna.

Between 1001:05 and 1001:32, the controller was engaged in a discussion with Mystic 42, a C-130 executing a practice approach at Elkins-Randolph County Airport (EKN), Elkins, West Virginia. According to recorded radar data, N508GT struck the communications tower at 1001:12. At 1001:37, the controller made the first of several unsuccessful attempts to contact the pilot and transfer communications to Morgantown Tower. There was no further contact with the airplane.

FAA Order 7110.65

The pilot was operating under visual flight rules (VFR) and had requested radar service from Clarksburg approach control. The controller identified the airplane and verified the observed and reported altitude as correct. At the time that the airplane was identified, it was about 3.8 miles from the communications tower, the trajectory was below the top of the tower, and the tower's location was depicted on the controller's radar map as an obstruction to flight.

Review of FAA Order 7110.65, "Air Traffic Control," Revealed that it provides direction to controllers on the services to be provided when a VFR aircraft requests radar advisories. Chapter 7, Section 6 of the order states in part:

7-6-1. APPLICATION

a. Basic radar services for VFR aircraft must include:

1. Safety Alerts.

2. Traffic Advisories.

3. Limited radar vectoring when requested by the pilot.

4. Sequencing at locations where procedures have been established for this purpose and/or when covered by a letter of agreement.

Chapter 2 of the order defines duty priorities and procedures to be followed in the provision of safety alerts:

2-1-2. DUTY PRIORITY

a. Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

2-1-6. SAFETY ALERT

Issue a safety alert to an aircraft if you are aware the aircraft is in a position/altitude which, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts. Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller.

NOTE-

1. The issuance of a safety alert is the first priority (see para 2-1-2, Duty Priority) once the controller observes and recognizes a situation of unsafe aircraft proximity to terrain, obstacles, or other aircraft. Conditions such as workload, traffic volume, the quality/limitations of the radar system, and the available lead time to react are factors in determining whether it is reasonable for the controller to observe and recognize such situations. While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized…

a. Terrain/Obstruction Alert. Immediately issue/initiate an alert to an aircraft if you are aware the aircraft is at an altitude which, in your judgment, places it in unsafe proximity to terrain/obstructions. Issue the alert as follows:

"LOW ALTITUDE ALERT (call sign), CHECK YOUR ALTITUDE IMMEDIATELY. THE (as appropriate) MEA/MVA/MOCA/MIA IN YOUR AREA IS (altitude)."

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	63
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	August 1, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 9, 2009
Flight Time:	(Estimated) 22000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	RAYTHEON AIRCRAFT COMPANY	**Registration:**	N508GT
Model/Series:	C90GT	**Aircraft Category:**	Airplane
Year of Manufacture:	2006	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	LJ-1775
Landing Gear Type:	Retractable - Tricycle	**Seats:**	9
Date/Type of Last Inspection:	May 11, 2011 Continuous airworthiness	**Certified Max Gross Wt.:**	10100 lbs
Time Since Last Inspection:	134 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	1439 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A-135A
Registered Owner:	OZ GAS AVIATION LLC	**Rated Power:**	550 Horsepower
Operator:	OZ GAS AVIATION LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MGW,1240 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	10:02 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:		**Visibility**	8 miles
Lowest Ceiling:	Broken / 2300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	26°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Farmington, PA (PA88)	**Type of Flight Plan Filed:**	None
Destination:	Morgantown, WV (MGW)	**Type of Clearance:**	None
Departure Time:	09:57 Local	**Type of Airspace:**	

Airport Information

Airport:	Morgantown Municipal Airport MGW	**Runway Surface Type:**	
Airport Elevation:	1243 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	Both in-flight and on-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	39.695835,-79.762222

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	Jerry L Morgan; FAA/FSDO; Charleston, WV Kris Wetherell; Beechcraft Corporation; Wichita, KS Jeffrey Davis; Pratt & Whitney Canada, Inc.; Bridgeport, WV Curt Fischer; NATCA; Merrimack, NH Beverley Harvey; TSBC; Gatineau Dana Metz; Honeywell Aerospace; Phoenix, AZ
Original Publish Date:	May 8, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=84055