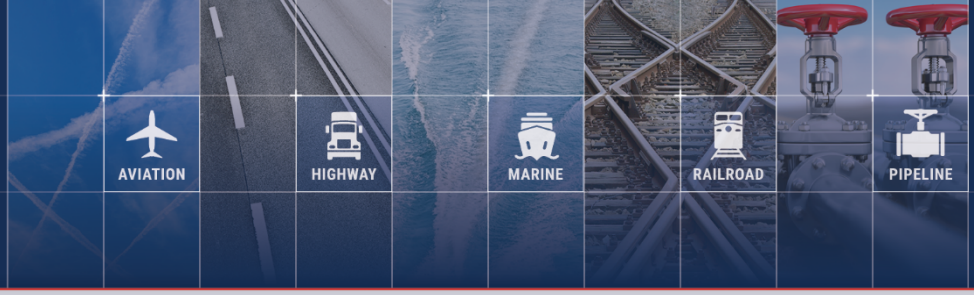

Aviation Investigation Factual Report

Location:	Panoche, California	**Accident Number:**	WPR12FA139
Date & Time:	March 14, 2012, 19:55 Local	**Registration:**	N364AB
Aircraft:	Beech B36	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Factual Information

HISTORY OF FLIGHT

On March 14, 2012, about 1955 Pacific daylight time (PDT), a Beech B36TC, N364AB, was substantially damaged when it impacted terrain in the Diablo Mountain range near Panoche, California, during a delivery flight from Gloucester, England, to San Jose, California. The airplane was recently purchased and operated by Lafferty Aircraft Sales (LAS), and was operated by American King Air Services (AKAS). The pilot sustained fatal injuries. The accident leg of the flight was conducted under the provisions of 14 Code of Federal Regulations Part 91, and in accordance with visual flight rules (VFR). Darkness and possible instrument meteorological conditions prevailed, and no Federal Aviation Administration (FAA) flight plan was filed for the flight.

According to the pilot-rated passenger who flew with him for a portion of the trip, the pilot took a commercial flight from South Carolina to Florida on March 7, 2012, and the two of them then flew commercially to London, England, that evening. They arrived in London on March 8, and began the delivery flight the next day. They landed in Bangor, Maine, on March 13, where the passenger separated and returned to Florida via commercial airline service. The pilot continued with the delivery flight, and made an overnight stop in Kentucky that evening. The pilot departed Kentucky about 0900 local time on March 14, made one fuel stop in Oklahoma, and a second in Arizona. During the Arizona fuel stop, the pilot informed his wife that his planned overnight stop was at Hollister Municipal Airport (CVH), Hollister, California, and that the route for the last segment of that flight was direct from the Palmdale very high frequency omnirange facility (PMD VOR) to CVH.

By the morning of March 15, neither the wife nor the pilot's business partner had heard from the pilot, and they began attempts to contact him. The FAA issued an Alert Notice (ALNOT) for the missing airplane later that morning. About 1200 PDT on March 17, the wreckage was found on a hillside, located on a ground track between PMD and CVH. The wreckage was located on a steep slope, was highly fragmented, and was damaged or consumed by fire. All major airplane components, or elements from them, were identified at the accident site. The wreckage was recovered to a secure facility for additional examination.

The passenger stated that they did not experience any mechanical anomalies during his trans-Atlantic portion of the trip. While at the fuel stop in Arizona, the pilot told his wife that the airplane was performing "perfectly."

PERSONNEL INFORMATION

The pilot was the president of AKAS, located in South Carolina. According to its website, one service provided by AKAS was the transport/delivery of airplanes over long distances. The pilot was transporting the airplane for LAS of San Jose, California.

Records provided by the FAA and LAS indicated that the pilot held multiple certificates and ratings, including an Airline Transport Pilot certificate. The 78-year-old pilot reported a total flight experience

of about 13,400 hours, including about 300 hours in Beech 35/36 airplanes. His most recent FAA second-class medical certificate was issued in October 2011. The pilot's resume reported that he had 196 Atlantic crossings in general aviation aircraft.

According to persons knowledgeable about the pilot's flying habits, whenever possible, although he was instrument rated and current, the pilot preferred to fly under VFR, and via direct routes using GPS. Witness and tracking data from the flight indicated that the pilot's behavior and actions were consistent with his reported preferences.

Details regarding the pilot's wake/sleep cycles and quality of sleep during the trip were not available.

In September 2007, based on a telephone call from an unidentified woman, the FAA began an investigation into the pilot's fitness to hold a second-class medical certificate. The caller claimed that the pilot had significant vision and hearing deficiencies. In spring 2007, the FAA determined that the pilot remained qualified to hold that certificate, and the available evidence indicated that the complainant was the pilot's ex-wife.

AIRCRAFT INFORMATION

The airplane was manufactured in 1991, and was equipped with a Continental Motors TSIO-520 series engine. The most recent annual inspection was completed in England on March 9, 2012. The maintenance records indicated that at the time of that inspection, the airframe, engine, and propeller each had a total time in service of 1,302 hours. The records also indicated that about 20 discrepancies that were noted by the inspecting technicians were dispositioned as "owner requests no action," and therefore no corrective actions for those items were accomplished.

The airplane was equipped, approved, and current for instrument flight rules (IFR) operations. In addition to the normal complement of avionics, the airplane was equipped with an autopilot and a King KLN-90B IFR certified GPS navigation system.

METEOROLOGICAL INFORMATION

On the day of the accident, accident locale sunset occurred at 1913, and local civil twilight ended at 1938. The moon did not rise until 0144 the next morning.

AIRMETs for icing, IFR conditions, and mountain obscuration were current for the accident locale and flight altitudes. The investigation was unable to determine whether the pilot was aware of those AIRMETs.

METARs from surrounding airports about the time of the accident were as follows:

CVH (leg destination; ~34 nm northwest of accident, elevation 230 ft)

1945 PDT Wind 290 degrees at 7 knots, visibility 10 miles, few clouds at 1,400 ft agl, overcast at 3,000 ft agl, temperature 14 degrees C, dew point 12 degrees C

2005 PDT Wind 300 degrees at 5 knots, visibility 10 miles, overcast at 3,000 ft agl, temperature 14 degrees C, dew point 12 degrees C

SJC (San Jose, ultimate destination; ~72 nm northwest of accident, elevation 62 ft)

1953 PDT Wind 100 degrees at 5 knots, visibility 10 miles, light rain, few clouds at 1,500 ft agl, scattered clouds at 3,000 ft agl, overcast at 6,500 ft agl, temperature 14 degrees C, dew point 12 degrees C

SNS (Salinas, ~38 nm west northwest of accident, elevation 85 ft)

1953 PDT Wind 340 degrees at 6 knots, visibility 10 miles, light rain, overcast at 6,500 ft agl, temperature 16 degrees C, dew point 12 degrees C

NLC (LeMoore, ~45 east southeast nm west northwest of accident, elevation 232 ft)

1956 PDT Wind 350 degrees at 8 knots, visibility 10 miles, scattered clouds at 6,500 ft agl, overcast at 15,000 ft agl , temperature 18 degrees C, dew point 8 degrees C

Rawinsonde data (information derived from an instrument package ascending through the atmosphere) identified a saturated or near-saturated environment between about 3,300 and 8,200 feet mean sea level (msl). A cross-section of that data identified an extensive area of relative humidity values greater than 94 percent between near-surface altitudes and approximately 4,300 feet msl. Satellite imagery indicated that cloudy conditions dominated much of the accident region, but a layer of high clouds prevented determination of whether clouds were present along the airplane's flight path or at the flight elevations near the accident site. Doppler weather radar imagery did not indicate significant meteorological targets above the accident location between altitudes of 3,100 and 9,100 feet msl.

AIDS TO NAVIGATION

According to the pilot's business partner, the pilot wanted to ensure that the database in the KLN 90B GPS unit was updated for the United States before he began the flight, and the partner understood that that update had been accomplished. According to a representative of the manufacturer of the KLN 90B, the device includes altitude features such as Minimum Safe Altitudes, Minimum En route Altitudes and altitude alerting.

The pilot also had a personal iPad with the "ForeFlight" program installed. The pilot-rated passenger who accompanied him from England to the US reported that the pilot used the iPad for that portion of the trip. The iPad was recovered from the wreckage and sent to the NTSB Recorders laboratory for download. The iPad/Foreflight does not store track data. The last map viewed in the ForeFlight program was that of the accident route leg, overlaid on IFR (instrument flight rules) low altitude en route charts. The accident leg route on the device was depicted as a straight line between the PMD VOR and CVH, the destination airport.

Reconstruction of the flight route from England to the accident location, using commercial tracking vendor data and air traffic control radar data, revealed that the pilot primarily flew direct legs between origin and destination airports, as opposed to routes that used established airways and ground-based navigation facilities.

The iPad/Foreflight examination results indicated that the pilot had the information necessary to enable him to determine the minimum safe altitudes for his route of flight and current location. A review of the

applicable VFR Sectional chart revealed that the charted Maximum Elevation Figure (MEF) was 5,600 feet msl in the vicinity of the accident location. MEF values provide pilots with a ready means to ensure terrain clearance, and they range between 100 and 300 feet above the highest obstruction within a given quadrangle. A review of the applicable En route Low Altitude IFR chart revealed that the applicable OROCA (Off Route Obstruction Clearance Altitude) was 7,600 feet msl. CVH elevation was 230 feet msl. The airplane impacted terrain at an elevation of 1,960 feet msl.

COMMUNICATIONS

Flight Services

Once in the US, the pilot did not file any flight plans, and did not obtain any official preflight weather briefings through Lockheed Martin Flight Services (LMFS), either telephonically or via the Internet. No records of any other pilot attempts to obtain weather information from other sources were located.

The only contacts the pilot had with LMFS were two separate radio communications, approximately 1 hour apart, on the morning of the accident day. Both communications occurred while the airplane was airborne and inbound to Woodward, Oklahoma. In both of those communications, the pilot requested and was provided weather information for the West Woodward airport (WWR).

Air Traffic Control

The pilot operated the accident leg under VFR but was using air traffic control (ATC) flight following services. The last known ATC facility that the pilot was communicating with was the Oakland Air Route Traffic Control Center, normally referred to as "Oakland Center." He had been assigned a discrete transponder beacon code for flight following purposes, and was tracked on radar until shortly before the accident. Review of the communications revealed that about 1949, the pilot informed ATC that he would like to begin a descent if that was acceptable to them. The controller approved the descent, and instructed the pilot to "maintain VFR," to which the pilot responded "roger will do." The radar data indicated that the pilot vacated his cruise altitude of 12,500 feet, and established a steady state descent.

About 1957, the controller asked the pilot to "report the Hollister area in sight," which the pilot agreed to do. About 13 seconds later, the controller told the pilot "you have descended below my radar coverage, radar contact is lost and I won't be able to see you again, you can contact NorCal approach in about ten miles on one two seven point one five for further advisories. And November four alpha bravo squawk V-F-R and frequency change is approved." The pilot asked the controller to repeat the frequency, which he did, and about 1958 the pilot confirmed the frequency. That was the last known communication from the airplane.

WRECKAGE AND IMPACT INFORMATION

On the morning of March 15, when neither the pilot's wife nor his business partner was able to contact the pilot, they notified the FAA. Later that morning the FAA issued an alert notice (ALNOT) that the airplane was missing, and review of communications and radar information enabled notification of authorities in the region of the last known location of the airplane. About 1130 on March 15, a deputy of the San Benito County Sheriff's department spied what he believed to be the wreckage. At that time, the deputy was positioned on a road several hundred feet below, and a few thousand feet laterally, from the wreckage. A search and rescue officer hiked up to the site, and confirmed that it was the airplane.

The accident site was in remote, sparsely populated mountainous terrain, with sparse tree and shrub cover. The accident site was situated about 34 miles from the destination airport. The magnetic heading from the accident site to the destination airport was approximately 294 degrees, and the debris field axis was similarly oriented. Site elevation was approximately 1,960 feet above mean sea level (msl). The impact site was on a localized upslope of approximately 35 degrees, and was situated on the northwest side of a wider flat-floored valley. A straight-line projection from the impact site back on the reverse azimuth of the impact heading showed that the impact site was the highest terrain for at least one-half mile, and possibly significantly more.

The debris field extended approximately 250 feet, but most of the debris was concentrated within about 60 feet of the initial impact point. Ground and vegetation scars were consistent with the airplane being approximately wings-level, in a level pitch attitude, at impact. Initial ground contact occurred with the right wingtip, which created a 15 foot long cut in a steep but sandy hillside that was parallel to the impact heading. That ground scar indicated that the flight path angle was approximately level or slightly descending.

The airplane was highly deformed and/or fragmented, and damaged or consumed by fire. All major components were accounted for at the accident site. The engine was partially attached to its mounts and firewall, and partially embedded in the slope. The propeller blades were separated from the engine and hub. One wing root remained partially attached to the fuselage lower structure. The fuselage/cabin was highly fragmented, and the bulk of it was consumed by fire. The vertical and right horizontal stabilizers were consumed by fire, and the left horizontal stabilizer was intact but separated from the airplane.

In addition to the on-scene examination of the wreckage, the recovered airframe and engine were examined at the recovery facility several weeks later. All observed fire damage was consistent with an on-ground (stationary) post impact fire. The observed evidence was consistent with landing gear and flaps retracted, and engine/propeller operating normally, at impact. No evidence of any pre-impact mechanical malfunction was noted during either examination.

MEDICAL AND PATHOLOGICAL INFORMATION

The Monterey County California Coroner's office conducted an autopsy on the pilot. The autopsy report indicated that the cause of death was "multiple blunt force injuries." The pilot also sustained post-mortem thermal injuries. The FAA Civil Aeromedical Institute conducted forensic toxicology examinations on specimens from the pilot, and reported that no ethanol, or any screened drugs, were detected.

ADDITIONAL INFORMATION

Trip Chronology

Witness and flight tracking data enabled the re-creation of the trip chronology. The pilot left his home in South Carolina on Wednesday, March 7, via a commercial flight. Later that evening he and the passenger took a commercial flight from Miami, Florida, to London, England, arriving in London about noon on Thursday, March 8. They then traveled by bus to Gloucester, England, where the airplane was located. The passenger, who accompanied the pilot back to the United States, reported that the trip from London to Gloucester appeared to be "longer and more difficult than the pilot expected." The original plan was to depart Gloucester for Wick, Scotland, later that day, but paperwork issues delayed their

departure until early Friday afternoon. They overnighted in Wick. The total flying time on Friday was about 3 hours.

Their intended first stop the next day was Keflavik, Iceland, but forecasts and winds caused them to file Egilsstadir, Iceland, as an alternate. On Saturday, March 10, they departed Wick for Keflavik, but then diverted to Egilsstadir. They refueled, and departed Egilsstadir for Keflavik, where they landed, refueled, and overnighted. The total flying time on Saturday was about 8 hours.

Since Greenland air traffic services were not available on Sunday, March 11, they remained in Keflavik Sunday and Sunday night. On Monday, March 12, they departed Keflavik, stopped in Greenland for fuel, and arrived in Goose Bay, Canada. Total flight time was about 11 hours, in 2 legs.

Fifteen hours after arriving in Goose Bay (where they cleared Canadian Customs and offloaded the overwater survival gear) they departed for Bangor, Maine. That flight leg was about 4.5 hours, and from there, the passenger used commercial airline service to return to Florida. After 40 minutes on the ground, the pilot departed Bangor, and flew 4.5 hours to Ohio. He refueled in Ohio, and flew another 1 hour 40 minutes to Kentucky, where he spent a 13-hour overnight.

On Wednesday, March 14, the pilot departed Kentucky, flew 5 hours, refueled, flew 3 hours 20 minutes, refueled, and then departed on the accident leg from Arizona to California. The accident occurred about 4 hours into the last leg of that day. The accident site was about 34 miles short of the pilot's destination (CVH) for that night. CVH was located about 37 miles from the final destination of San Jose, California.

Accident Flight Leg

The final leg of the flight, from SJN to CVH, was conducted under VFR, and the pilot used ATC flight following services for most of that leg. Recovered data indicated that at least the last segment of that leg, before the pilot began a steady descent to CVH, was flown at 12,500 feet. The descent began about 7 minutes before loss of radar contact due to radar coverage limitations. The last recorded radar target associated with the airplane indicated that the airplane was descending through 5,100 feet at that time. Extrapolation of radar-derived speed and descent rate data yielded results that were consistent with a steady descent from cruise to the impact point.

Supplemental Oxygen

Paragraph 91.211 ("Supplemental Oxygen") of the Federal Aviation Regulations required that a pilot be provided with and use supplemental oxygen for that part of a flight that is of more than 30 minutes duration at cabin pressure altitudes above 12,500 feet (msl) and up to and including 14,000 feet (msl). With the exception of the last several minutes of the accident leg, altitude data for the trip was not obtained. As noted elsewhere in this report, the ATC radar data indicated that at least the last cruise portion of the accident leg was conducted at 12,500 feet.

The airplane was equipped with two wing-mounted 49-cubic-foot oxygen tanks. Both tanks were found in the debris field. Each tank throat was plugged with a red plastic cap. No oxygen regulators or portable oxygen systems were identified in the wreckage.

According to FAA publication FAA-H-8083-25, Pilot's Handbook of Aeronautical Knowledge (PHAK), "the word "hypoxia" means "reduced oxygen" or "not enough oxygen." Although any tissue will die if

deprived of oxygen long enough, usually the most concern is with getting enough oxygen to the brain, since it is particularly vulnerable to oxygen deprivation. Any reduction in mental function while flying can result in life threatening errors. Hypoxia can be caused by several factors, including an insufficient supply of oxygen."

The document further stated that "All pilots are susceptible to the effects of oxygen starvation, regardless of physical endurance or acclimatization. When flying at high altitudes, it is paramount that oxygen be used to avoid the effects of hypoxia" and as "altitude increases above 10,000 feet, the symptoms of hypoxia increase in severity."

CFIT

According to FAA information, controlled flight into terrain (CFIT) accidents account for 17 percent of all general aviation fatalities. The FAA defines a CFIT accident as a situation that occurs when a properly functioning aircraft "is flown under the control of a qualified pilot, into terrain (water or obstacles) with inadequate awareness on the part of the pilot of the impending collision."

NTSB CFIT Safety Alert

In January 2008, the NTSB issued a Safety Alert (SA) entitled "Controlled Flight Into Terrain in Visual Conditions" with the subheading "Nighttime Visual Flight Operations Are Resulting in Avoidable Accidents." The SA stated that recent investigations identified several accidents that involved CFIT by pilots operating under visual flight conditions at night in remote areas, that the pilots appeared unaware that the aircraft were in danger, and that increased altitude awareness and better preflight planning likely would have prevented the accidents.

The SA suggested that pilots could avoid becoming involved in a similar accident by accomplishing several actions, including:
- Proper preflight planning
- Obtaining flight route terrain familiarization via sectional charts or other topographic references
- Maintaining awareness of visual limitations for operations in remote areas
- Following IFR [instrument flight rules] practices until well above surrounding terrain
- Advising ATC about potential inability to avoid terrain
- Employing a GPS-based terrain awareness unit

Situational Awareness

The PHAK defined situational awareness as the "accurate perception of the operational and environmental factors that affect the airplane, pilot, and passengers during a specific period of time." The PHAK stated that a situationally aware pilot "has an overview of the total operation and is not fixated on one perceived significant factor." The PHAK stated that "some of the elements inside the airplane to be considered are the status of airplane systems, and also the pilot and passengers," and cautioned that "an awareness of the environmental conditions of the flight, such as spatial orientation of the airplane, and its relationship to terrain, traffic, weather, and airspace must be maintained."

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	78
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Unknown
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 2 With waivers/limitations	**Last FAA Medical Exam:**	October 12, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	13681 hours (Total, all aircraft), 300 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N364AB
Model/Series:	B36 TC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	EA-519
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 9, 2012 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1302 Hrs as of last inspection	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed	**Engine Model/Series:**	TSIO520
Registered Owner:	Jim Lafferty Aircraft Sales	**Rated Power:**	
Operator:	Jim Lafferty Aircraft Sales	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	CVH,230 ft msl	**Distance from Accident Site:**	34 Nautical Miles
Observation Time:	20:05 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 3000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots / None	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:	30.14 inches Hg	**Temperature/Dew Point:**	14°C / 12°C
Precipitation and Obscuration:	In the vicinity - None - Rain		
Departure Point:	St Johns, AZ (SJN)	**Type of Flight Plan Filed:**	None
Destination:	Hollister, CA (CVH)	**Type of Clearance:**	None
Departure Time:	16:05 Local	**Type of Airspace:**	

Airport Information

Airport:	Hollister Municipal CVH	**Runway Surface Type:**	
Airport Elevation:	230 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:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	36.528057,-120.843055

Administrative Information

Investigator In Charge (IIC):	Huhn, Michael
Additional Participating Persons:	Randal Rutkowski; FAA FSDO; San Jose, CA Paul Yoos; Hawker Beechcraft; Wichita, KS Rodney Martinez; Continental Motors; Mobile, AL
Report Date:	September 9, 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=83152