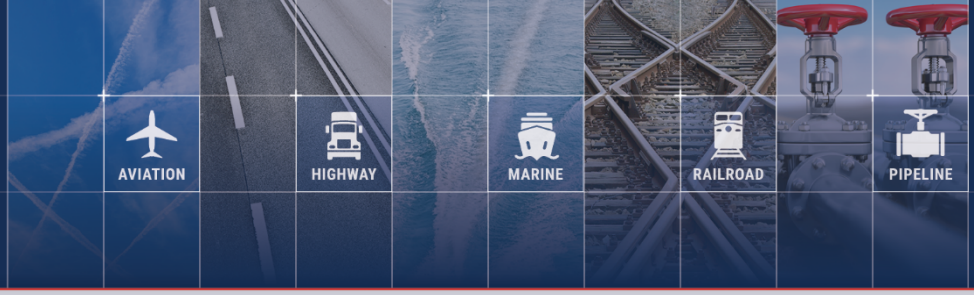

Aviation Investigation Final Report

Location:	HALAWA, Hawaii	**Accident Number:**	LAX97FA032
Date & Time:	November 1, 1996, 19:07 Local	**Registration:**	N1701K
Aircraft:	Piper PA-34-200	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	5 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noninstrument-rated commercial pilot departed in VFR conditions at twilight. En route, the pilot encountered marginal VFR conditions. Radar data showed that the aircraft made a gradual left turn toward rising terrain, as it entered an area of poor weather. Subsequently, it flew into rising wooded terrain at an elevation of about 1,600 feet, near the top of a mountainous ridge. Witnesses in a sparsely inhabited rural area located about 3 miles from the accident site reported that the light condition was 'pitch black,' when the aircraft flew low over their location, and that instrument meteorological conditions (IMC) prevailed. 'Torrential' rains, which had just ended at their location, continued in the area where the aircraft impacted terrain. No preaccident mechanical malfunction of the aircraft was found. Another pilot, who had flown the aircraft recently, stated that the heading indicator would precess 30 degrees in 10 minutes. The pilot's flight instructor said that he (the pilot) was working toward an instrument rating, but was not yet qualified to fly by reference to instruments.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's inadvertent VFR flight into instrument meteorological conditions (IMC), and his failure to maintain sufficient clearance and/or altitude from mountainous terrain. Factors related to the accident were: darkness, adverse weather conditions, and mountainous terrain.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. LIGHT CONDITION - DARK NIGHT
2. WEATHER CONDITION - OBSCURATION
3. WEATHER CONDITION - RAIN
4. (C) VFR FLIGHT INTO IMC - INADVERTENT - PILOT IN COMMAND
5. (F) LACK OF TOTAL INSTRUMENT TIME - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: CRUISE

Findings
6. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
7. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On November 1, 1996, at 1907 hours Hawaiian standard time, a Piper PA-34-200, N1701K, collided with mountainous terrain while in cruise flight 2 miles west of Halawa, Hawaii, on the island of Molokai. The aircraft departed Molokai Airport, Kaunakakai, on the island of Molokai, about 1845 en route to Kahului Airport, on the island of Maui. The aircraft was destroyed and the non instrument rated commercial pilot and four passengers were fatally injured. Witnesses near the accident site reported that instrument meteorological conditions prevailed.

The flight originated earlier in the day at Kahului for the purpose of transporting five members of the Maui County Democratic Party to a political rally on Molokai, and arrived in Molokai about 1600. The pilot was the Co-Chairman of the Maui County Democratic Party.

According to newspaper accounts, the group was upbeat about prospects for the election coming in 4 days. According to the other co-chairperson, however, about 1830 the pilot expressed concern about the weather and expressed his desire to leave on the return flight. She described him as seemingly apprehensive. Another person at the rally drove the five people back to the airport, dropped them off at about 1845, and left as they were walking to the plane. That person said that the sun had set but that there was still light in the sky, and that the ground was wet but it was not raining. The tower closed at 1830 and there are no known observers to the departure.

Recorded CDR radar data from Honolulu Combined En route Radar and Approach (CERAP) shows a VFR aircraft departing Molokai at 1849 and proceeding east-bound along the south shore of Molokai into the Pailolo Channel, which separates Molokai from Maui. Over the channel, the target made a wide left turn back (westbound) toward the east end of Molokai until radar contact is lost near the accident site at 1905. There is a 2 minute and 22 second interruption in radar data starting at 1859:12 when the aircraft is about 5 miles west of Honokahua, on Maui. The track resumes at 1901:34 when the aircraft is 4 miles northwest of Nakalele Point, tracking northeast, and is turning westbound toward Molokai. While eastbound along the south shore of Molokai and in the Pailolo Channel, the aircraft's mode C altitude data indicates approximately 1,700 feet with a brief climb to 2,100 feet. When radar tracking is resumed 4 miles northwest of Nakalele Point after the interruption in radar data, the aircraft's mode C altitude is 1,600 feet. As the aircraft turns left and tracks westbound the altitude reaches a minimum of 900 feet as the aircraft crosses the eastern shoreline of Molokai after which it again climbed, reaching 1,700 feet approximately at the accident site.

Review of the recorded air-ground communications tapes at the Honolulu CERAP disclosed that the pilot contacted Maui Approach Control at 1902:15 and reported "inbound for landing,"

over Nakalele Point, "with the information." The controller issued a discrete transponder code of 1737. At 1904:28, the controller instructed the pilot to report Nakalele Point. The pilot asked the controller to repeat the instruction, which the controller did, without acknowledgment from the pilot.

The tapes revealed that at 1905:02 the pilot acknowledged a heading issued to another aircraft. The controller issued a heading of 270 degrees to Aloha 161 at 1904:53, and Aloha 161 read back the heading at 1904:59. At 1905:02, the pilot of the accident aircraft read back the 270-degree heading assignment. At 1905:03, the controller clarified that the 270-degree heading was for Aloha 161, and again instructed the pilot of the accident aircraft to report Nakalele Point.

At 1905:10, the pilot radioed that he could not see Nakalele Point. The controller replied, "say again, your radio is broken and unreadable. You can't see Nakalele Point?" At 1905:20, the pilot again transmitted that he was unable to see Nakalele Point. Radar data indicates that at this time the aircraft was westbound, approximately 1 mile from the accident site, and that Nakalele Point was at the pilot's 6 o'clock position about 12 miles behind him. At 1905:22, the controller instructed the pilot to report 10 miles northwest of the airport.

At 1905:39, the controller radioed the aircraft was in radar contact 3 miles west of Cape Halawa, going westbound. The controller asked, "you going to Honolulu?" There was no further radio communication from the aircraft.

There were seven witnesses on the eastern end of Molokai who saw the lights of the aircraft and/or heard the aircraft as it proceeded westbound and passed over their locations.

According to the Maui Police Department Report of the accident, two Molokai residents were fishing on the east coastline of the island and heard the airplane fly overhead at a low altitude from east to west on the evening of the accident. They reported that it was dark at the time, raining heavily, and that there was thunder.

Another person, a former airline mechanic, observed the aircraft from the veranda of his weekend home, which is near sea level on the north side of Honouliwai Bay (east end of Molokai). His friend called him outside to see a low flying aircraft. By the time he got out on the veranda, the airplane had flown over his house from east to west at a 400 to 500 feet altitude, and was climbing on a westerly heading into rising terrain. The engines sounded normal to him. It had rained earlier, but at the time it was drizzling under an overcast cloud layer. He stated that up the mountain in the area into which the aircraft climbed, it was very dark and still raining heavily. He could see from his house across the channel to Maui and could see the beacon of Kahului Airport.

Two witnesses who were inside their residence at the Puu O Hoku Ranch reported that the aircraft passed over their position at a low altitude. One of them was talking on the telephone and reported that the engine noise interrupted her ability to hear the conversation. Both

reported that the engines sounded smooth and powerful, and that the aircraft must have been going slow because it didn't pass quickly. They reported that conditions outside were very dark with very low clouds and that a "torrential" rain had just ended.

Two other witnesses observed the aircraft while outside their residence, which is about 1/4 mile west of the previous witnesses at a slightly higher elevation. One of these witnesses was the ranch manager who reported that intense rain had stopped about 5 minutes prior, and that his rain gauge showed that 1.8 inches of rain had fallen at that location in the previous 45 minutes. These witnesses also reported that it was very dark and that the ceiling was less than 1,000 feet and the visibility about 1/8 mile in fog and drizzle. They observed the aircraft turn to pass near the ranch which has the only lights in the area. The ranch manager said that he was attracted to the aircraft by the loud, "throaty" engine sound, and that he observed the aircraft's position and strobe lights as it passed over his position. The location where they observed the aircraft from is at latitude 21 degrees 08.56 minutes north, and longitude 156 degrees 44.34 minutes west (GPS). The ranch manager estimated the aircraft's altitude to be "about 2 pine trees" (approximately 200 feet agl).

The pilot of another aircraft, who was chartered to transport other people to the same political function on Molokai, heard the pilot on the radio in the minutes before the accident. This pilot had already brought one group of people from Molokai to Kahului and was en route back to Molokai to pick up a second group. After departure from Kahului about 1855, he was over Nakalele Point when Maui Approach Control called VFR traffic at 2 o'clock, 3 miles. Seconds later, N1701K contacted Maui Approach from that position, 3 miles west of Nakalele Point. The pilot of the second aircraft said that he could hear both 01K and Maui Approach clearly, and that the pilot of 01K sounded "stressed and flustered."

The second pilot changed frequencies and preceded to Molokai via the south shore, going over at 1,000 feet and returning at 1,500 feet, VFR. He said that at the time of the accident there were clouds over the east end of Molokai, but that it was clear in the channel between Maui and Molokai. There was no rain and it was "pitch black." He opined that it would have been easy for a non instrument rated pilot to get disoriented.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate issued March 1, 1996, with restrictions prohibiting the carrying of passengers in airplanes for-hire at night and on cross-country flights of more than 50 nautical miles. He had owned the accident aircraft until shortly before the accident and had an agreement with the new owner that he could continue to use the aircraft "for the express purpose of staying current." The agreement, signed October 11, 1996, stated in part that "9. I will not fly the aircraft at night unless accompanied by a certified flight instructor...." Furthermore, the agreement states "15. I agree to return the Aircraft to the Owner at Kahului Airport, Maui, Hawaii on or before sunset . . ." and in bold print immediately below the pilot's signature "The aircraft must be returned to the owner at Kahului Airport no later than 6 PM."

The pilot's logbook recorded total flying time of 670.4 hours, of which 13.8 hours were at night, 5.0 hours were actual instrument hours, 19.4 hours were simulated instrument hours (hood) and 5.5 hours were in a simulator. Single engine land aircraft flight hours totaled 183.2 hours and multiengine land hours totaled 487.1 hours.

The logbook recorded that, in the previous 90 days, the pilot had flown 13.2 hours, all in the accident aircraft, of which 1.3 hours was at night and included two night landings.

The logbook also recorded that, in the previous 6 months, the pilot had flown 36.9 hours, all except 2.0 hours of which were in the accident aircraft. Seven hours were at night, including 9 night landings. The pilot had logged 2.4 hours of actual instrument time (dual), 4.8 hours of simulated instrument time, and five instrument approaches.

The pilot's flight instructor, who was a former business partner and who recommended him for his commercial pilot certificate, reported that his most recent instructional flight with the pilot was in June, 1996. He said that the pilot was working towards an instrument rating, but did not have a formal course syllabus or a schedule of instruction and took instrument instruction irregularly. He said that the pilot had a "good attitude toward safety," but that he was not qualified to fly by reference to instruments. He said that the pilot maintained the accident aircraft very well since he was a licensed mechanic and he (the flight instructor) could not recall it ever having any serious mechanical discrepancies. He thought that the pilot may have turned west abeam Nakalele Point because he lost visual reference and wanted to be assured of remaining clear of terrain near Nakalele.

Another flight instructor, who had flown with the pilot as recently as June, 1996, reported that the pilot was marginal at night, not strong on instruments and instrument navigation, and that the pilot didn't like it when he simulated an engine failure. Regarding the accident he said, "I can see him getting behind the plane."

AIRCRAFT INFORMATION

During the period from September 29, 1996, to the date of the accident, the aircraft was flown by three pilots, one of whom was the pilot involved in the accident. The current owner of the aircraft, who last flew it on October 27, 1996, reported that there were no discrepancies (squawks) on the aircraft. The third pilot was a flight instructor who gave instruction in the aircraft on October 21, 1996. That flight instructor told the Safety Board that the directional gyro was precessing and that the number one communications radio (receiver) was weak. He recalled that the DG was precessing about 30 degrees in 10 minutes. His recollection was that while on a easterly heading (090) the card would precess to 100, 110, 120, etc. He had also flown the aircraft at night and recalled that the instrument panel lighting was operating properly.

METEOROLOGICAL INFORMATION

A meteorological study was prepared by a Safety Board staff meteorologist and is appended to this report. The study notes that the Surface Analysis for 2000 indicated an inverted trough of low pressure extending from west of the Hawaiian Islands north-northeast to a low located about 30 degrees north 160 degrees west. A cold front extended from the low southward between Kauai and Oahu. The Synoptic Discussion and Guidance Product, prepared at 1115, stated, in part, "some heavy showers were reported over the past few hours over Lanai and Molokai with some moving close to Oahu and west Maui also." The same product, prepared at 1715, stated, in part, "there are still a few heavy showers on Molokai this late afternoon but they should taper off after dark."

COMMUNICATIONS

The Air Traffic Control Group Chairman's Factual Report of Investigation is attached. Interviews were conducted with the controller at Honolulu Combined En route Radar and Approach (CERAP) and her supervisors regarding the communications transcript and their recollections. The certification of personnel and equipment was verified and the timeliness of the ALNOT issuance was investigated. According to a memorandum from the Honolulu Automated Flight Service Station (AFSS) dated November 12, 1996, there had been no request for a pilot weather briefing from a pilot identified with the accident aircraft.

WRECKAGE AND IMPACT INFORMATION

The aircraft impacted on an east facing mountain slope at approximately 1,600 feet msl at latitude 21 degrees 09.21 minutes north, and longitude 156 degrees 46.41 minutes west (GPS). The mountain side slopes downward to the east about 10 degrees and is in an area of dense vegetation consisting of small diameter trees to 20 feet tall and abundant tropical vegetation. The wreckage created a clearing in the vegetation oriented 285 degrees (magnetic). The clearing was approximately 35 feet wide and 180 feet long. The entire aircraft was present in the proximity of the cleared area and there was no fire.

At the eastern end of the clearing, the tops of the trees were cut off evenly on a slope approximately 5 degrees down to the west and 5 degrees down to the south. A ground disturbance was observed 40 feet along the wreckage path where the vegetation was completely cleared, the muddy soil exposed, and the remaining long grasses laid down uniformly in a westerly direction. The area of exposed ground impact was initially about 35 feet wide and narrowed to about 15 feet wide further along the wreckage path.

Thirty-five feet along the wreckage path and 15 feet left of the centerline was the left wing outboard section with the aileron attached. At 80 feet along the wreckage path and 13 feet to the right of center was the right wing outboard leading edge assembly (fuel tanks); the right wing tip fairing was found 10 feet further along the path. Throughout this area there was an abundance of small pieces of aluminum which were primarily from the outboard wing panels.

At 100 feet along the wreckage path and 6 feet right of center was the outboard end of the

right horizontal stabilizer and the right hand aileron.

Between 100 and 140 feet the terrain sloped down approximately 20 degrees into a ravine oriented northeast-southwest. At 120 feet, and on centerline, was the right wing and engine nacelle with the flap attached. At 130 feet, and 5 feet right of center, was the right-hand engine and propeller.

At 140 feet, and on centerline, was the entire fuselage with the left wing; the left engine and propeller were adjacent.

Beyond 140 feet from the initial disturbance the terrain sloped upward approximately 30 degrees and the only aircraft component found beyond this point was the hydraulic power pack, which was on centerline at 180 feet.

The aircraft was relocated to a level site on the Puu O Hoku Ranch, 2 miles east of the accident site, on November 3, 1996.

The aircraft cabin was configured with six forward facing seats and the fuselage was destroyed from the nose aft to the wing spar carry through structure in front of the second row of seats; however, the nose wheel assembly was located with the remainder of the fuselage components. The instrument panel was broken loose but remained attached to the fuselage. The fuselage and empennage were intact from the second row of seats aft. The right side of the horizontal stabilator was twisted down and aft, and approximately 2 feet of the outboard end was separated. The outboard seat belt buckle (tongue end) on the left rear seat was broken where the belt attaches to the buckle.

Most of the instrument panel light bulbs were destroyed; however, five bulbs were intact in the wreckage. The overhead panel flood light bulb was intact, with even coil spacing and no distortion to the filament. One post light bulb located between the turn and slip indicator and the directional gyro was undamaged and exhibited filament distortion with even spacing of the coils. On the left engine cluster, the inboard light board was blackened, the filament was broken, and the coils were evenly spaced. Both light bulbs on the right engine instrument cluster exhibited distorted filaments with stretched coils.

The left wing, with the left engine and propeller attached, was severed from the fuselage at the root but remained attached by control cables. Outboard of the engine nacelle the wing was broken into several pieces, typically of 3 to 5 foot dimension. The aileron cables were broken outboard of the nacelle and displayed frayed ends.

The right wing was completely separated from the fuselage at the root and the aileron cables displayed frayed ends. The engine assembly was separated from the nacelle. The leading edge forward of the wing spar and outboard of the nacelle was separated from the remainder of the wing. The aileron was found in between the wing leading edge pieces and the remainder of the wing, which was found near the fuselage in the wreckage distribution path. This section

included the landing gear and flap.

The left engine and prop were attached to the nacelle. The air filter element was intact and contained some vegetation residue. A continuity check and thumb compression check was performed and the accessory gears rotated. The exhaust pipes were bent between the collector and the exhaust opening. The vacuum pump shear coupling, vanes and rotor were intact.

The right engine was separated from the nacelle and the propeller was broken from the engine crankshaft flange. The air filter element was intact and contained some vegetation residue. A continuity check and thumb compression check was performed and the accessory gears rotated. The exhaust pipes were bent between the collector and the exhaust opening. The vacuum pump shear coupling, vanes, and rotor were intact.

One blade of the left propeller contained a long smooth bend aft about 8 inches from the hub. The other blade exhibited torsional twisting and chordwise scratches from the tip in about 18 inches.

One blade of the right propeller contained a smooth bend aft over its length with a tight bend near the tip. The other blade was smoothly bent aft approximately 160 degrees with the center of the bend near the midspan location.

Both propellers were sent to Hartzell Propeller Company and were disassembled and inspected on February 7, 1997, in the presence of the Safety Board. A trapped piston in the left propeller dome was in a position corresponding to a 23- to 25-degree blade pitch angle. A crease in the pitch change rod of the right position also corresponded to a 24- to 25-degree blade pitch angle. Their report is attached and notes no evidence of pre-accident malfunction.

Both engines were sent to Textron Lycoming and were disassembled and inspected on February 10 and 11, 1997, in the presence of the Safety Board. No abnormalities were noted. Their report is also attached.

The directional gyro and attitude gyro (artificial horizon) were disassembled and inspected on December 23, 1996. Both instruments had tags affixed indicating that they had been overhauled on November 1, 1995, and the overhaul seals (blue putty) were undisturbed. Both instruments had impact damage to the case and face of the instruments, and the directional gyro had damage to the case frame which mounts the gyro assembly and contains the air manifold. The air inlet screens of both instruments were clear of debris and no debris was observed in either instrument's air passages. Neither gyro showed evidence of rotational scraping to either the gyro rotor or case. Both rotors rotated freely on their respective shaft when spun manually.

The fuel injection servos and the fuel distribution valves were examined and checked on a flow bench at Precision Airmotive Corporation on March 12, 1997, in the presence of the Safety

Board. The operating linkage on the servo from the right-hand engine had been forced over center during the accident, damaging the idle stop pin and keeping the throttle from opening fully. This was rectified by partially disassembling the linkage and reinstalling it properly. Some of the test points on this servo were outside limits due to damage to the throttle and mixture stop pins and their nylon spacers. The other (left engine) servo tested within specifications except for the low idle setting. The Precision Airmotive report is attached. No abnormalities were noted that would have precluded normal operation of the engine fuel injection systems prior to the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by Clinical Laboratories of Hawaii, Inc., and a toxicological analysis was performed by the FAA's Civil Aeromedical Institute. No drugs or ethanol were detected, and tests for carbon monoxide and cyanide were not performed due to lack of suitable specimen.

ADDITIONAL INFORMATION

According to officials from the state and local Democratic Parties, the pilot had flown a considerable number of flights for the party, maybe 20, since becoming county party co-chairman in May, 1996. He was not paid by the Party for any of the flights, it was "strictly a political contribution".

The wreckage was released to A.P.B. Services, Inc., adjusters for AIG Aviation Insurance Services, on March 17, 1997.

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 12, 1996
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	670 hours (Total, all aircraft), 100 hours (Total, this make and model), 550 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N1701K
Model/Series:	PA-34-200 PA-34-200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-7250196
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	August 24, 1996 Annual	**Certified Max Gross Wt.:**	4200 lbs
Time Since Last Inspection:	39 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	1811 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	L/IO-360-C1E6
Registered Owner:	ROBERT P. MCCARTHY	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	0.12 miles
Lowest Ceiling:	Overcast	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	KAUNAKAKAI , HI (MKK)	**Type of Flight Plan Filed:**	None
Destination:	KAHULUI , HI (OGG)	**Type of Clearance:**	None
Departure Time:	18:45 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	4 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Fatal	**Latitude, Longitude:**	21.079542,-157.009307(est)

Administrative Information

Investigator In Charge (IIC):	Parker, Richard
Additional Participating Persons:	RICHARD NELSON; HONOLULU , HI MARK W PLATT; WILLIAMSPORT , PA CHARLES R LITTLE; VERO BEACH , FL CHARLES R MOTE; SAN DIEGO , CA
Original Publish Date:	January 30, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29587