National Transportation Safety Board
Aviation Accident Final Report

Location:	HONOLULU, HI	**Accident Number:**	LAX97FA108
Date & Time:	02/22/1997, 0623 HST	**Registration:**	N7969K
Aircraft:	Beech H18	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Minor
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The airplane was loaded with mail & freight within 57 lbs of its max takeoff weight limit. No malfunction was noted during start or taxi. The pilot made a near-midfield intersection departure from runway 8L at 0622:35 local time. Seconds earlier, a Boeing 747 had completed its landing roll-out on runway 4R, which crossed runway 8L near its departure end. Winds were from 285 deg at 2 kts. The pilot & loader (a private pilot) said nothing unusual occurred during takeoff until the aircraft climbed to 100' agl, then 'suddenly the airplane yawed to the left as though the left engine had lost power.' Despite use of full right rudder, directional control was lost, & the pilot decreased the pitch attitude because of 'severe yawing and rolling tendencies.' The airplane's left wing tip impacted the right side of the runway, the tricycle gear collapsed, & the airplane slid to a stop & was consumed by fire. Due to fire damage & lack of accurate records, neither the total fuel load, the freight's actual weight, the cargo's preimpact location within the aircraft, nor the adequacy of the cargo tie down system could be validated. Weight & balance documents filed with the FAA were at variance with 'duplicate' documents held by the operator. Exam of the engines did not reveal evidence of a preimpact failure. Propeller ground scars on the runway indicated both engines were operating during impact. The accident occurred during the pilot's last flight as an employee with the company.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: loss of aircraft control for undetermined reason(s).

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. LIGHT CONDITION - BRIGHT NIGHT
2. LOADING OF CARGO - GROUND PERSONNEL
3. PROCEDURE INADEQUATE - COMPANY/OPERATOR MANAGEMENT
4. MAINTENANCE,RECORDKEEPING - INACCURATE - COMPANY/OPERATOR MANAGEMENT
5. (C) AIRCRAFT CONTROL - NOT MAINTAINED
6. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On February 22, 1997, at 0623 hours Hawaiian standard time, a Beech H18, N7969K, operated by Polynesian Airways, Inc., as flight 222, crashed on runway 8L at the Honolulu International Airport, Ohau, Hawaii. The flight was operated under 14 CFR Part 135, and the airplane was primarily transporting U.S. mail. The airplane was substantially damaged upon impacting the runway and thereafter was destroyed by fire. The airline transport certificated pilot and a cargo loader, the sole passenger, received minor injuries. Visual meteorological conditions prevailed, and a visual flight rules flight plan was filed. The nighttime flight was originating at the time of the accident. The intended destination was on the island of Lanai, Hawaii.

According to the pilot, upon arrival for work the cargo loader had already loaded about 1/2 of the airplane. The loader finished his work, and the pilot completed the cargo manifest form which indicated that the airplane was near its maximum allowable gross weight and within its center of gravity (CG) limits.

The pilot performed a preflight inspection of the airplane, and he did not report observing any maintenance discrepancies or anomalies. The pilot and the loader boarded the airplane, and the engines were started without evidence of malfunction. They taxied for takeoff, performed an engine run-up, and completed all checklist items without any indication of problems.

The pilot further indicated that he provided a standard takeoff briefing regarding engine failure possibilities to the loader. He received an air traffic clearance for departure, and at 0622:35 he acknowledged the clearance and proceeded to takeoff on runway 8L from the intersection of taxiway Lima. This location was between 1,000 and 1,500 feet short of the midfield location. (See the airport diagrams.)

In the pilot's report, he made the following statement to the National Transportation Safety Board regarding the sequence of events which then occurred:

"Takeoff acceleration was normal. Rotation occurred at 90 (VMC + 5). I left the gear down and accelerated toward blue line (120). Suddenly, the airplane yawed to the left as though the left engine had lost power. I confirmed the mixtures, throttles and props were forward and unsuccessfully tried to maintain directional control with full right rudder. It was then necessary to lower the nose immediately because of severe yawing and rolling tendencies leaving little time to do anything other than maintain directional control and land the aircraft. The impact sheared off the gear, but was not enough to cause any deceleration related injuries."

The loader also provided a statement to the Safety Board. In pertinent part, the loader did not report that the pilot had initially experienced any difficulties handling the airplane, and nothing unusual was noted until after liftoff. Between 3 and 5 seconds after becoming airborne the airplane yawed left.

As the airplane slid to a stop a fire started. The pilot and loader exited the airplane through the cockpit windshield. The airplane came to rest near the United Airlines terminal, and the crash was witnessed by several employees who were located outside the terminal on the ramp. The accident was also observed by several airport security officers. In summary, the witnesses reported that the maximum altitude which the airplane gained during its brief flight was

between 75 and 100 feet above ground level. As the airplane descended its wings rocked back and forth, and the airplane impacted the runway while in a left bank.

PERSONNEL INFORMATION

Pilot-in-Command.

The pilot holds an airline transport pilot certificate with an airplane multiengine land rating. He has commercial privileges in single engine land airplanes. The pilot also holds a flight instructor certificate with airplane single engine and multiengine land and instrument airplane privileges. The pilot satisfactorily completed a FAR Part 135 airman competency/proficiency flight check in a Beech D18 on November 27, 1996.

A review of the pilot's recent flying experience in the accident airplane revealed that he had flown the airplane on 20 flights during February, 1997.

The pilot reported that during the accident flight he had been the only person handing the flight controls. The pilot also reported that he had planned to terminate his employment with Polynesian Airways following the flight.

Loader.

The loader holds a private pilot certificate with airplane single engine, multiengine, and instrument airplane ratings. During the accident flight, the loader had occupied the cockpit's front right seat. The loader reported having no flying responsibilities during the flight, and indicated he had not handled any of the flight controls.

The loader reported to the Federal Aviation Administration (FAA) coordinator that the evening before the flight he had worked between 2200 and 0200 at another job site. Thereafter, he did not sleep. Around 0330 he picked up the mail cargo and transported it to Polynesian Airways whereupon he commenced loading it into the accident airplane. He was involved with the loading process for approximately 2 hours.

AIRPLANE INFORMATION

Structural Modification.

The airplane had been modified to facilitate hauling cargo. Some of the modifications included replacing the tail wheel with a nose wheel (Volpar conversion), and changes to the load weight limits of the fuselage floor. The airplane's revised maximum takeoff and landing weights were 9,900 and 9,500 pounds, respectively.

Airplane Records.

The FAA examined the operator's records in conjunction with its examination of the airplane. The airplane contained a document on which crewmembers listed discrepancies and the operator listed its corrective maintenance action. The document was found devoid of any comments.

The airplane's total time since new could not be verified because of discrepancies in the operator's records. The times listed in this report are approximations.

In summary, the FAA further reported that a comparison between logbook entries and airplane data plate information revealed discrepancies. For example, the serial number listed on the right engine's data plate did not match its logbook entry. The left engine's propeller governor

had been installed without corresponding written (return to service) documentation. No logbook evidence was found for installation of the right engine's propeller governor. Both engines' propellers had been operated for 294.4 hours beyond required inspection times. Based upon logbook entries, the required interval between AAIP inspections had been exceeded. The "Flight Handbook" revision was not current and did not contain the supplement for installation of the Volpar gear. A 30-day recurring airworthiness directive had not been complied with.

Fuel Load Accuracy.

On February 28, 1997, the pilot verbally reported to the Safety Board that during his preflight inspection of the airplane he determined that the two main fuel tanks held the standard quantity of fuel necessary for the flight. As listed on the airplane's flight load manifest form, the total fuel weight was 600 pounds. The auxiliary fuel tanks were empty.

The Safety Board observed a wooden dip stick in the airplane wreckage. The stick was inscribed with markings which were, according to the operator, indexed to reflect the quantity of fuel contained in the airplane's fuel tanks.

A review of the airplane's manuals revealed no provision for using a homemade style dip stick to determine the fuel quantity. No calibration data or FAA authorization was found for using the dip stick. The pilot reported that he had never checked the accuracy of the dip stick.

The Safety Board requested that the operator provide evidence to validate the accuracy of the fuel quantity markings on the dip stick. The operator reported that because the stick was also used on another of its Beech 18 airplanes, he would check its accuracy with that airplane. The operator subsequently reported that the stick was found inaccurately marked and indicated he would discontinue its usage.

Loading Procedure and Airplane Weight.

The operator received its U.S. Postal Service cargo accompanied by weight manifests indicating the mail's weight to the nearest pound. The operator also received freight. The loader reported that he placed the cargo into the airplane and noted the fuselage station at which it was positioned. Thereafter, the loader proceeded into the company office and prepared the load manifest for the pilot.

Upon the Safety Board's examination of the accident flight's manifest, it was noted that four of the six weight totals associated with specific fuselage station locations had been rounded off to the nearest 100 pound increment, and the fifth and sixth weight totals had been rounded off to the nearest 10 and 50 pound increments. The manifest indicated that, based upon these rounded off weights, the airplane had been loaded to 9,843 pounds, or 57 pounds under its certificated maximum takeoff weight.

Because of the fire damage, no postimpact documentation of the cargo's actual weight was made. Also, the cargo's preimpact location in the airplane could not be verified. No provision for rounding off the cargo weight in the manner described by the pilot was found in the company's FAA approved operating specifications or in the operator's manuals.

METEOROLOGICAL INFORMATION

Several witnesses located on the ramp outside the United Airlines terminal reported that the wind was calm at the time of the accident. Following the accident, the plume of smoke which

emanated from the burning airplane went straight upward. No discernable wind was noticed.

WRECKAGE AND IMPACT INFORMATION

Air traffic control personnel reported that the airplane initiated its takeoff roll in an easterly direction on runway 8L near the intersection of taxiway Lima. The FAA coordinator reported that evidence of the airplane's initial touchdown was observed on the runway approximately 4,100 feet to the east, near taxiway Echo. At this location, marks corresponding to the airplane's left wingtip were apparent near the right side of the runway. Additional score marks corresponding to the airplane's fuselage, and multiple laceration-type gouge marks corresponding to the rotating left and right engines' propellers, were observed oriented in a northeasterly direction diagonally across the surface of the runway.

The airplane came to rest in an upright attitude with collapsed landing gear on the left side of runway 8L, just prior to the hold short line for runway 4L. The location was between taxiways Echo and Kelo.

The airplane was observed destroyed by a postimpact ground fire. All of the flight control surfaces were located with the airplane. No evidence of preimpact flight control malfunction was found.

TESTS AND RESEARCH

Turbulence.

The Safety Board interviewed airport operation personnel to ascertain whether any approvals had been given for turbojet airplanes to perform power push backs from any gates positioned in the vicinity of the accident airplane's flight path. The personnel reported, and their ramp control logs confirmed, that no clearances for this type of operation had been issued.

The Safety Board performed a review of the arrival and departure movements of turbojet air traffic on or near runway 8L and within 5 minutes of the accident airplane's takeoff. Two airplanes were found within this criteria.

The FAA reported that at 0617:15, a Hawaiian Airlines DC-9 had departed using runway 8L from the Lima intersection. Also, between 0621:39 and 0622:19, a China Airlines Boeing 747 had landed on runway 4R which intersects runway 8L near its departure end. The Boeing had completed its landing rollout by about 0623. (See the air traffic communications transcripts and the airport diagrams.)

The Honolulu Airport is equipped with a low level wind shear alert system (LLWAS) which had the potential for measuring wind shear and wake turbulence. The two closest recording sensors to the accident site and to the landing Boeing 747 were located near taxiway Lima, to the north and south of runway 8L. (See the LLWAS placement map.)

The sensors' recorded data was reviewed for the period between 0622:06 and 0624:56. During this time interval the north field sensor indicated the wind was calm. The south field sensor (known as the centerfield sensor) indicated the prevailing wind was from 285 degrees at 2 knots. The FAA reported that any wake vortices generated by an aircraft landing on runway 4R would propagate away from runway 8L.

Engine and Propeller Examinations.

The FAA performed partial teardown examinations of the fire and impact damaged engines. In

summary, the FAA reported finding no evidence which precluded the engines from operating. The propeller blades from both engines appeared torsionally twisted and gouged. (See the engine examination report and photographs.)

Loading.

According to the loader, he placed 1,907 pounds of mail and "approximately 300 lbs. of freight" onboard the airplane. The location where the mail and freight had been stacked in the fuselage was not specifically identified.

The operator provided the Safety Board with postal documentation for the weight of the mail cargo. No source documents were provided for the freight's weight.

The Safety Board was unable to accurately reconstruct the airplane's total weight, and its CG. Following the accident, the U.S. mail and freight was removed from the airplane without documentation of its preimpact fuselage location.

In addition, records maintained by the operator and contained in the airplane were examined and were found at variance with weight and balance records maintained by the FAA. For example, the operator supplied the pilot/loader with a printed form onto which the cargo's weights were listed for the accident flight. The form contained the notation that the airplane's empty weight was 6,663 pounds, and its empty moment was "703" representing 703,000 inch pounds. The "703" figure was used in the computation of the airplane's CG.

The operator provided the Safety Board with a signed copy of the airplane's last weighing document, dated September 30, 1996, which accordingly listed the airplane's empty moment at 703,695.0 inch pounds.

The FAA subsequently obtained a copy of what initially appeared to be the same document from archives maintained by the Aircraft Registration Branch in Oklahoma City. A comparison between the operator's document with the FAA's document revealed that they both were dated September 30, 1996, and bore the same signature. However, the FAA's document listed the airplane's empty moment as 709,975.8 inch pounds.

The previous owner of the airplane, Union Flights of Sacramento, California, had provided the operator with records indicating that at a 9,690 pound weight (the accident flight weight was listed as 9,693 pounds), the airplane's CG range was from 112.4 to 121.5 inches. Based upon the cargo weight and placement locations indicated by the pilot/loader for the accident flight, at departure the airplane's CG was calculated at approximately 118.4 inches aft of datum.

Had the operator based its calculations using the FAA's record of airplane moment, the calculated CG would have moved aft approximately 0.7 inches. It would have been about 119.1 inches aft of datum.

ADDITIONAL INFORMATION

On February 28, 1997, the airplane wreckage was verbally released to the owner's assigned insurance representative. No airplane parts or records were retained by the Safety Board.

Pilot Information

Certificate:	Airline Transport	**Age:**	35, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	01/15/1997
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	1867 hours (Total, all aircraft), 142 hours (Total, this make and model), 1788 hours (Pilot In Command, all aircraft), 83 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N7969K
Model/Series:	H18 H18	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	BA-702
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	01/27/1997, AAIP	**Certified Max Gross Wt.:**	9900 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	16600 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	R-985
Registered Owner:	POLYNESIAN AIRWAYS, INC.	**Rated Power:**	450 hp
Operator:	POLYNESIAN AIRWARS	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	PORA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Bright
Observation Facility, Elevation:	HNL, 13 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	0550 HST	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Scattered / 5000 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	None / 0 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	18°C / 17°C
Precipitation and Obscuration:			
Departure Point:	(HNL)	**Type of Flight Plan Filed:**	VFR
Destination:	LANAI, HI (LNY)	**Type of Clearance:**	VFR
Departure Time:	0623 HST	**Type of Airspace:**	Class D

Airport Information

Airport:	HONOLULU INTERNATIONAL (HNL)	**Runway Surface Type:**	Asphalt
Airport Elevation:	13 ft	**Runway Surface Condition:**	Dry
Runway Used:	8L	**IFR Approach:**	None
Runway Length/Width:	12357 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Minor	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	WAYNE POLLACK	**Report Date:**	12/31/1998
Additional Participating Persons:	JOEL KOFF; HONOLULU, HI		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		