Aviation Investigation Final Report

Location:	Stockton, California	**Accident Number:**	LAX00LA288
Date & Time:	August 4, 2000, 17:24 Local	**Registration:**	N39KH
Aircraft:	Bell 47D	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot performed an autorotative landing to an open field following a loss of engine power while in cruise flight. The skids contacted a berm on touchdown, and the helicopter began rocking. As the helicopter pitched fore and aft, the main rotor blades and tail rotor blades contacted the ground. The single engine helicopter utilized a single-tank fuel system capable of containing 29 gallons of fuel. The pilot anticipated a 16 g.p.h. fuel-flow, and determined he had an endurance of 1 hour 48 minutes. The helicopter engine run time was 1 hour 35 minutes prior to losing power. The pilot's post accident inspection of the aircraft revealed that the fuel load had been exhausted. He indicated in the accident report, under the section titled "Recommendation (How Could This Accident Have Been Prevented)," that he could have conducted "more planning on cross-country flights."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate planning by which he miscalculated fuel consumption which resulted in fuel exhaustion.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: CRUISE

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
3. (C) FUEL CONSUMPTION CALCULATIONS - INADEQUATE - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
4. AUTOROTATION - PERFORMED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
5. TERRAIN CONDITION - BERM

Factual Information

On August 4, 2000, at 1724 Pacific daylight time, a Bell 47D helicopter, N39KH, was substantially damaged during an autorotative forced landing near Stockton, California. The forced landing was precipitated by a loss of engine power during cruise flight. The commercial pilot, the sole occupant, was not injured. The helicopter was registered to a private individual, and was operated by the pilot as a personal flight under 14 CFR Part 91 when the accident occurred. The flight originated from Fresno, California, at 1549, and was destined for Stockton. Visual meteorological conditions prevailed at the time of the accident, and a flight plan had not been filed.

The pilot reported he had topped off the helicopter's fuel tank prior to departure. The total fuel capacity of the single-tank helicopter is 29 gallons. The pilot anticipated a fuel consumption of 16 g.p.h., and estimated he had approximately 1 hour 48 minutes of flight endurance available.

After 1 hour 35 minutes of engine run time, the engine lost power while 2 miles from the destination airport. The pilot performed an autorotative landing to an open field. The skids contacted a berm on touchdown, and the helicopter began rocking. As the helicopter pitched fore and aft, the main rotor blades and tail rotor blades contacted the ground.

The pilot reported that his post accident inspection of the aircraft revealed that the fuel load had been exhausted. Surface temperatures along the route of flight were above 90 degrees Fahrenheit. He indicated in the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2), under the section titled "Recommendation (How Could This Accident Have Been Prevented)," that he could have conducted "more planning on cross-country flights."

The commercial pilot reported having had accumulated approximately 600 total rotorcraft flight hours, of which 40 hours were accumulated in the same make and model as the accident helicopter.

Pilot Information

Certificate:	Commercial	**Age:**	35,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	October 27, 1999
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	March 10, 2000
Flight Time:	1600 hours (Total, all aircraft), 40 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N39KH
Model/Series:	47D 47D	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	39
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	April 20, 2000 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	19 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3007 Hrs at time of accident	**Engine Manufacturer:**	Franklin
ELT:	Not installed	**Engine Model/Series:**	644-178-B32
Registered Owner:	Keith Harvey	**Rated Power:**	178 Horsepower
Operator:	Pablo M. Ejarque	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SCK,30 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	16:56 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	34°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Fresno, CA (FAT)	**Type of Flight Plan Filed:**	None
Destination:	Stockton Metro, CA (SCK)	**Type of Clearance:**	VFR
Departure Time:	16:05 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Stockton Metropolitan SCK	**Runway Surface Type:**	
Airport Elevation:	30 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	37.894443,-121.238609

Administrative Information

Investigator In Charge (IIC):	Crispin, Robert
Additional Participating Persons:	Timothy L Jarrard; Federal Aviation Administration; Oakland, CA
Original Publish Date:	November 25, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49932