



# Aviation Investigation Final Report

<b>Location:</b>	MESA, Arizona	<b>Accident Number:</b>	LAX98LA076
<b>Date &amp; Time:</b>	January 16, 1998, 17:30 Local	<b>Registration:</b>	N176SP
<b>Aircraft:</b>	McDonnell Douglas 600N	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

The CFI was having the second pilot execute straight in autorotations for familiarization training. The second pilot initiated the autorotation with the rotor in the low range and the CFI instructed the second pilot to reduce collective, which increased their rate of descent. The CFI said that about 18 feet, the second pilot applied 60 percent collective, leveled somewhat, and the nose yawed to the left. The CFI applied full right pedal in an attempt to correct the yaw, but the nose remained yawed to the left approximately 15 degrees. The aircraft hit the ground with the left heel first followed by the nose pitching forward. The CFI stated he applied slight aft cyclic and felt the main rotor contact the tail boom.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The second pilot misjudging his flare and the delayed remedial actions by the pilot-in-command.

## Findings

Occurrence #1: HARD LANDING  
Phase of Operation: LANDING - FLARE/TOUCHDOWN

- Findings
1. MISC ROTORCRAFT, MAIN ROTOR/TAIL BOOM CONTACT
  2. TERRAIN CONDITION - GRASS

3. (C) FLARE - MISJUDGED - PILOT IN COMMAND
4. (C) REMEDIAL ACTION - DELAYED - PILOT IN COMMAND(CFI)

## Factual Information

On January 16, 1998, at 1730 hours mountain standard time, a McDonnell Douglas 600N, N176SP, sustained substantial damage during the touchdown autorotation at Mesa, Arizona. The aircraft was owned and operated by the West Virginia State Police, and one of their pilots was undergoing familiarization training by a Boeing/McDonnell Douglas instructor pilot. The flight instructor and commercial pilot who was receiving instruction were not injured. The flight originated at Falcon Field at 1600.

The aircraft was being operated on a standard airworthiness certificate which was issued on January 14, 1998. The West Virginia State Police pilot (referred to as the second pilot) was undergoing pilot transition training when the accident occurred. The second pilot stated that he was attempting to execute the second full touchdown autorotation, and "I was too high off the ground when I pulled the collective and hit the ground too hard."

The first pilot, the Boeing Certified Flight Instructor (CFI), said that the second pilot was executing a straight in autorotation. As the autorotation was begun, the CFI stated that the rotor started low in the acceptable range, so he prompted the second pilot to further reduce the collective, and their rate of descent increased. The CFI stated the maneuver was still satisfactory, with a low flare. He stated that about 18 feet, the second pilot applied "60 percent collective, leveled somewhat, and the nose yawed to the left." At that point, the CFI said he applied full right pedal in an attempt to straighten the aircraft, but the nose remained yawed approximately 15 degrees to the left. The aircraft hit the ground with the left heel first, followed by the nose pitching forward. The CFI stated he applied slight aft cyclic, when he felt the main rotor contact the tailboom.

According to the aircraft manufacturer, the touchdown resulted in a hard landing, which caused the main rotor blades to flex and contact the tailboom. The tailboom was subsequently fractured by the rotor blade contact. The aircraft remained upright and the engine was shutdown using the emergency shutdown procedures.

## Pilot Information

<b>Certificate:</b>	Airline transport; Commercial; Flight instructor	<b>Age:</b>	49, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Helicopter	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical-w/ waivers/lim	<b>Last FAA Medical Exam:</b>	August 25, 1997
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	12726 hours (Total, all aircraft), 85 hours (Total, this make and model), 12053 hours (Pilot In Command, all aircraft), 95 hours (Last 90 days, all aircraft), 41 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	McDonnell Douglas	<b>Registration:</b>	N176SP
<b>Model/Series:</b>	600N 600N	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	RN012
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>	Annual	<b>Certified Max Gross Wt.:</b>	4100 lbs
<b>Time Since Last Inspection:</b>	13 Hrs	<b>Engines:</b>	1 Turbo shaft
<b>Airframe Total Time:</b>	13 Hrs	<b>Engine Manufacturer:</b>	Allison
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	250-C47M
<b>Registered Owner:</b>	WEST VIRGINIA STATE POLICE	<b>Rated Power:</b>	650 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	FFZ ,1392 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	17:45 Local	<b>Direction from Accident Site:</b>	240°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	30 miles
<b>Lowest Ceiling:</b>	Broken / 20000 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	40°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	(FFZ )	<b>Type of Flight Plan Filed:</b>	Company VFR
<b>Destination:</b>		<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	16:00 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	FALCON FIELD FFZ	<b>Runway Surface Type:</b>	Grass/turf
<b>Airport Elevation:</b>	1392 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	0	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	500 ft / 200 ft	<b>VFR Approach/Landing:</b>	Simulated forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	33.510608,-111.580551(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Childress, Deborah
<b>Additional Participating Persons:</b>	JOHN ELLER; SCOTTSDALE ,AZ
<b>Original Publish Date:</b>	February 15, 2001
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=30023">https://data.nts.gov/Docket?ProjectID=30023</a>

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