Aviation Investigation Final Report

Location:	Brooksville, Florida	**Accident Number:**	ERA10LA009
Date & Time:	October 1, 2009, 14:00 Local	**Registration:**	N81FW
Aircraft:	BUTLER AIRCRAFT COMPANY AEROSTAR	**Aircraft Damage:**	Substantial
Defining Event:	Landing gear collapse	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot/owner selected the landing gear to the extended position in preparation for landing. The amber light, which was designed to illuminate temporarily to indicate that the gear was in transit, did not illuminate during the gear extension, but all other indications were normal. After touchdown on the paved runway, the nose gear did not remain extended and the airplane pitched down until the nose contacted the runway surface. The airplane came to a stop on the runway and sustained substantial damage. Preliminary examination revealed that the cockpit landing gear position indicator lights functioned properly. However, lack of replacement parts availability had prevented the repair of the airplane through at least January 2011, and the detailed functional checks and examinations that were planned to be conducted concurrently with the repair have not been accomplished. Maintenance records documented several recent, preaccident repairs to the nose and main landing gear systems, but it could not be determined whether the nose gear collapse was related to those maintenance activities.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The collapse of the nose landing gear during landing rollout for undetermined reasons.

Findings

Aircraft	Nose/tail landing gear - Failure
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Landing-landing roll	Landing gear collapse (Defining event)

HISTORY OF FLIGHT

On October 1, 2009, about 1400 eastern daylight time, a Butler Aircraft Aerostar 601, N81FW, was substantially damaged when the nose gear collapsed on landing at Hernando County Airport (BKV), Brooksville, Florida. The certificated private pilot/owner, the sole person on board, was not injured. The personal flight was operated under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight.

According to the pilot, he departed in the mid-wing, twin-engine airplane from Albert Whitted Airport (SPG), St. Petersburg, Florida for the flight to BKV, a non-towered airport. He set up for a landing on runway 3, which was charted as a concrete surface 5,015 feet long and 150 feet wide. The airplane was equipped with three green lights, one for each landing gear, that were designed to illuminate when the three landing gear were properly extended for landing. The pilot reported that after he selected the landing gear to the down position, he observed that the three green lights were illuminated.

The pilot reported that the airplane touched down "normally" on the main landing gear, but when he lowered the nose to place the nose gear on the runway for the rollout, the airplane continued to pitch down until the nose structure contacted the runway surface. The propeller tips contacted the runway, and the airplane slid to a stop on its main landing gear and the nose structure. The airplane did not depart the paved runway surface, and there was no fire.

PERSONNEL INFORMATION

Federal Aviation Administration (FAA) records indicated that the pilot held a private pilot certificate with airplane single-engine and multi-engine land ratings, and an instrument airplane rating. He had approximately 1,847 total hours of flight experience, which included approximately 51 hours in the accident airplane make and model, and approximately 8 hours in the accident airplane. His most recent flight review was completed in August 2008, and his most recent FAA third-class medical certificate was issued in September 2008.

AIRCRAFT INFORMATION

According to FAA records, the airplane was manufactured in 1970, and was equipped with two Lycoming IO-540 series piston engines. Previous registration numbers assigned to this airplane included N7482S and N31FW. The accident pilot purchased the airplane in June 2009. The airplane's most recent annual inspection was completed in January 2009, and at that time, it had accumulated a total of 4,232 hours in service. The pilot reported that at the time of the accident, the airplane had accumulated a total time in service of 4,255 hours.

METEOROLOGICAL INFORMATION

The 1353 BKV recorded weather observation included winds from 010 degrees at 5 knots, 10 miles visibility, clear skies, temperature 28 degrees C, dew point 9 degrees C, and an altimeter setting of 29.99 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

According to information provided by the FAA inspector who examined the airplane, the nose gear doors, the lower forward nose skins and the underlying structure exhibited crush and abrasion damage from the runway contact.

Post-accident discussions with the pilot revealed that an amber light normally illuminated to denote when the landing gear was in transit to the extended position, but on the accident flight, the amber light did not illuminate when the gear was in transit. The airplane was also equipped with a warning horn designed to sound when the throttles were retarded whenever the landing gear was not extended. The pilot stated that there was no pre-takeoff check of this warning horn system, and that the horn did not sound during the accident approach and landing.

ADDITIONAL INFORMATION

Previous Maintenance Activity

Review of FAA records revealed that in 1989, a major repair was accomplished on the lower nose section of the airplane. The repairs included replacement of webs, skins, and nose landing gear door assemblies. The reason for the repair was not determined.

Review of maintenance records indicated that concurrent with the most recent annual inspection, which was completed in January 2009, several discrepancies were identified and corrected. Discrepancy number 15 was cited as "Nose gear doors hang open about 4 inches," and the stated corrective action was reported as "Checked and found rigging not correct and incorrect attach bracket installed. Installed correct attach bracket on nose gear and rigged and adjusted doors as needed." The correct, newly-installed component was part number 5462014-1. Subsequent discussions with the maintenance facility technician who conducted the subject

maintenance revealed that the nose gear doors were opened and closed by a series of mechanical sequencing links that were driven by the retraction or extension of the nose gear, without any additional actuation or control system components. The technician stated that it was one of those sequencing links that was the component referred to as the "attach bracket" in the corrective action write-up for the discrepancy.

Discrepancy number 16 was cited as "Nose gear oleo strut leaking," and the stated corrective action was "resealed and serviced nose gear strut." Discrepancy number 31 was "hydraulic leak coming from belly," and the sources were identified as the landing gear actuating valve and the flap actuating valve. The stated corrective action was "removed and resealed valves."

Airplane Examination

Subsequent to the accident, the airplane was partially hoisted, the nose gear was manually extended and locked, and the airplane was placed in a hangar on its gear. An FAA inspector conducted a preliminary examination of the airplane in this condition. He reported that when electrical power was applied to the airplane, the three green landing gear lights on the instrument panel illuminated, which was the normal indication that all three landing gear were properly extended. The amber "gear in transit/unsafe" light was equipped with a push-to-test feature, and illuminated when pushed.

According to the pilot, he has had the airplane scheduled for repair since the October 2009 nose gear event, but as of January 2011, lack of available replacement parts has prevented the start of that maintenance activity. As a consequence, certain investigative activities that were contingent upon the planned maintenance activities have not been accomplished. Those investigative activities included functional checks of the landing gear aural warning system, and the landing gear retraction and extension system. Therefore, to date, no failure mechanisms or component failures, including the items repaired during the most recent annual inspection, have been identified as contributory or causal to the accident sequence.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	September 25, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 11, 2008
Flight Time:	(Estimated) 1847 hours (Total, all aircraft), 51 hours (Total, this make and model), 1633 hours (Pilot In Command, all aircraft), 71 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BUTLER AIRCRAFT COMPANY	**Registration:**	N81FW
Model/Series:	AEROSTAR 601	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	61-0049-94
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	January 26, 2009 Annual	**Certified Max Gross Wt.:**	5700 lbs
Time Since Last Inspection:	23 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	4232 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540
Registered Owner:	On file	**Rated Power:**	290 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BKV,76 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	13:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	28°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	St Petersburg, FL (SPG)	**Type of Flight Plan Filed:**	None
Destination:	Brooksville, FL (BKV)	**Type of Clearance:**	Unknown
Departure Time:	12:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Hernando County Airport BKV	**Runway Surface Type:**	Concrete
Airport Elevation:	76 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	03	**IFR Approach:**	None
Runway Length/Width:	5015 ft / 150 ft	**VFR Approach/Landing:**	Unknown

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:**	28.473611,-82.455276(est)

Administrative Information

Investigator In Charge (IIC):	Huhn, Michael
Additional Participating Persons:	Frank Schaefer; FAA/FSDO; Tampa, FL
Original Publish Date:	July 18, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74867