		NTSB ID: ANC05LA123		Aircraft Registration Number: N63EB	
		Occurrence Date: 08/12/2005		Most Critical Injury: Minor	
		Occurrence Type: Accident		Investigated By:	
Location/Time					
Nearest City/Place Palmer		State AK	Zip Code 99645	Local Time 1500	Time Zone ADT
Airport Proximity: On Airport/Airstrip		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer Brabandt		Model/Series RV-9A		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On August 12, 2005, about 1500 Alaska daylight time, a tricycle gear-equipped homebuilt experimental Brabandt RV-9A airplane, N63EB, sustained substantial damage when it nosed over during the landing roll at a private airstrip, about 6 miles west of Palmer, Alaska. The airplane was being operated as a visual flight rules (VFR) local area personal flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by the pilot. The commercial certificated pilot, the sole occupant, received minor injuries. Visual meteorological conditions prevailed. The flight originated at the Palmer Airport about 1450, and no flight plan was filed.</p> <p>During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on August 15, the pilot reported that he landed with full flaps on runway 21 at the Cardwell Airstrip, a gravel/dirt surfaced runway, which is about 1,200 feet long, and about 50 feet wide. He indicated that he had landed at the airstrip several times before the accident. He said his touchdown speed was about 58 mph, and he touched down about 20 feet from the end of the runway. He said that several seconds later, he felt what seemed to be the nose wheel dragging, and shortly thereafter, the nose wheel seemed to drag again, but much harder. The airplane subsequently nosed over, and received structural damage to the fuselage, the left elevator, the left wingtip, the rudder, and the vertical stabilizer. The pilot indicated that his inspection of the runway surface revealed that about 500 feet after touchdown, the nose wheel landing gear began producing scuff marks on the runway surface that became progressively deeper. The nose gear strut and fork eventually dug into the runway surface, and buckled the nose landing gear strut aft.</p> <p>The pilot indicated that he is the builder of the kit-supplied airplane, and has accrued about 115 hours in the airplane. The kit was produced by Van's Aircraft, Inc., Aurora, Oregon. The pilot said the nose wheel tire is a 4:00 X 5 size, and the wheel is free-castering. The spring steel nose gear strut angles forward and downward from its upper attach point. The nose fork assembly is comprised of a metal swiveling housing block, attached to the lower end of the threaded strut by a nut. The forward rectangular face of the swivel housing is flat, and vertically oriented. The bottom edge of the nose fork assembly is about 1 and 1/8 inches above the bottom of the strut. The distance from the ground to the bottom of the strut where the retaining nut is installed is about 4 inches. The nose wheel and tire are retained by a bolt through two triangular-shaped side plates that extend aft of, and on either side, of the swivel housing. The accident airplane's nose fork assembly and upper portion of the nose wheel and tire were enclosed by a teardrop-shaped fiberglass wheel pant, and the upper, forward-facing surface of the strut was covered by abrasion tape. The distance from the bottom of the wheel pant to the ground is about 2 and 7/16 inches.</p> <p>The airplane and the landing airstrip were examined by an NTSB Air Safety Investigator on August 16. The examination revealed that the nose gear strut was buckled aft and downward from its normal geometry. The forward end of the nose gear wheel pant was broken. The forward face and lower edge of nose fork assembly, and the lower end of the bolt, was encrusted with dirt and had scuffing and</p>					
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National Transportation Safety Board

## FACTUAL REPORT

AVIATION

NTSB ID: ANC05LA123

Occurrence Date: 08/12/2005

Occurrence Type: Accident

## Narrative (Continued)

abrasion marks on the housing. The tape applied to the gear strut, just above the nose fork assembly, was torn and abraded.

The dirt/gravel surface airstrip was dry. Slight, uneven surface undulations were noted in the area where the nose wheel fork assembly began to scuff the tops of the undulations, producing slight gouge marks that began about 500 feet from the approach end of the runway. The gouge marks increased in depth toward the end of the runway, and ended where the nose fork dug into the ground.

There were no skidding signatures or evidence that the main landing wheel tires were locked before the airplane nosed over.


Staff has examined data for 18 recent accidents and one incident in which Vans Aircraft series RV-6A, RV-7A, RV-8A, or RV-9A airplanes have become inverted during landing. Several involved hard landings such as hard touchdowns, bounced landings (six), or landing in a slip. Several others involved off-field landings in rough terrain, hitting a ditch, or going down an embankment.


Four of the accidents and one incident involved a touchdown and the start of a rollout on an unpaved runway, followed by the nose gear folding back. The airplanes would then slide for varying distances before nosing over. Staff also examined data for four additional incidents in which the nose gear collapse during taxi but the airplane did not nose over. These nine accidents and incidents occurred on various unpaved surfaces including gravel, turf, soft turf, hard surface with "washboard" bumps, and slight depressions. These nine cases involve the nose gear strut and fork digging into the ground and the nose gear bending aft.

Van's Aircraft Inc., posted a letter on their company website, dated March 10, 2005, concerning nose gear and nose wheel fork issues. The letter indicated that over the history of the company's products, the number of operational kit-built tricycle gear airplanes has increased, along with an increase in damage to the nose gear. The company stated that their review of NTSB accident reports pointed to pilot proficiency as the most significant factor. The letter said the company has produced a lighter weight leg/fork combination, with increased clearance between the nose strut axle and the ground, which may be beneficial in certain extreme operating conditions; however, there was no data indicating that increased clearance at the axle would reduce the likelihood of a nose gear failure. The company indicated that the new leg/fork combination was being shipped with current finish kits, but they had insufficient data to warrant a recommendation to replace any nose gear components on aircraft currently flying. The letter closed with a statement that said, "Ensuring correct tire pressure, adequate wheel fairing-to-tire clearance, correct axle nut torque, and exercising proper pilot technique are the best way to prevent any problem with the nose gear."

During a telephone conversation with the president of Van's Aircraft Inc. on December 14, 2005, he indicated that the redesigned leg/fork combination increases the distance from the ground to the bottom of the nose gear strut to about 5 inches. The ground-to-wheel pant distances remain unchanged. The president of Van's Aircraft also indicated that the nose wheel assembly on their new four-place kit airplane would have a different design.

A Structures Study and examination of several RV nose over accidents found that a number of factors or combinations of those factors, can lead to the loss of ground clearance for the nose gear strut and fork. Factors may include poor piloting technique, bounced landings, low tire pressure, heavier engine/propeller combinations, forward center of gravity, soft ground, heavy braking, high grass, undulating ground, and depressions in or objects on the runway.

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: ANC05LA123			
		Occurrence Date: 08/12/2005			
		Occurrence Type: Accident			
<b>Landing Facility/Approach Information</b>					
Airport Name Cardwell Strip	Airport ID:	Airport Elevation 490 Ft. MSL	Runway Used 21	Runway Length 1200	Runway Width 50
Runway Surface Type: Dirt; Gravel					
Runway Surface Condition: Dry					
Approach/Arrival Flown: NONE					
VFR Approach/Landing: Full Stop					
<b>Aircraft Information</b>					
Aircraft Manufacturer Brabandt		Model/Series RV-9A		Serial Number 90057	
Airworthiness Certificate(s): Experimental (Special)					
Landing Gear Type: Tricycle					
Amateur Built Acft? Yes	Number of Seats: 2	Certified Max Gross Wt. 1800 LBS	Number of Engines: 1		
Engine Type: Reciprocating	Engine Manufacturer: Superior	Model/Series: XP-360	Rated Power: 180 HP		
- Aircraft Inspection Information					
Type of Last Inspection 100 Hour	Date of Last Inspection 08/2005	Time Since Last Inspection 15 Hours	Airframe Total Time 115 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type Yes /	ELT Operated? No	ELT Aided in Locating Accident Site? No			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner Earl W. Brabandt		Street Address			
		City Sparks	State NV	Zip Code	
Operator of Aircraft Earl W. Brabandt		Street Address			
		City Sparks	State NV	Zip Code	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Personal					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ANC05LA123
	Occurrence Date: 08/12/2005
	Occurrence Type: Accident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth	Age 75
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Sex: M	Seat Occupied: Left	Occupational Pilot?	Certificate Number: On File
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Certificate(s): Flight Instructor; Commercial

Airplane Rating(s): Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Single-engine

Current Biennial Flight Review? 12/2004

Medical Cert.: Class 2	Medical Cert. Status: With Waivers/Limitations	Date of Last Medical Exam: 01/2005
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	2115	115	2115							
Pilot In Command(PIC)										
Instructor										
Instruction Received										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? No
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: None


Departure Point	State	Airport Identifier	Departure Time	Time Zone
Palmer	AK	PAAQ	1450	ADT
Destination	State	Airport Identifier		
Palmer	AK	34AK		

Type of Clearance: None

Type of Airspace:

**Weather Information**


Source of Wx Information:  
  
Unknown

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ANC05LA123
	Occurrence Date: 08/12/2005
	Occurrence Type: Accident

Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation Ft. MSL	WOF Distance From Accident Site NM	Direction From Accident Site Deg. Mag.
Sky/Lowest Cloud Condition: Clear			Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		Ft. AGL	Visibility: 10	SM	Altimeter: "Hg
Temperature: 21 °C	Dew Point: °C	Weather Conditions at Accident Site: Visual Conditions			
Wind Direction:		Wind Speed: Calm		Wind Gusts:	
Visibility (RVR): Ft.		Visibility (RVV) SM			
Precip and/or Obscuration: No Obscuration; No Precipitation					

Accident Information		
Aircraft Damage: Substantial	Aircraft Fire: None	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot			1		1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -			1		1
Other Ground					
- GRAND TOTAL -			1		1

 National Transportation Safety Board <b>FACTUAL REPORT</b> AVIATION	NTSB ID: ANC05LA123	
	Occurrence Date: 08/12/2005	
	Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

Scott Erickson

Additional Persons Participating in This Accident/Incident Investigation:

John Harrington  
FAA AL-ANC FSDO 03  
Anchorage, AK