## National Transportation Safety Board Washington, DC 20594

## **Brief of Accident**

## Adopted 06/27/2007

ANC05LA123 File No. 21390	08/12/2005	Palmer, AK	Aircraft Reg No.	N63EB	Tim	ne (Local): 15:00 ADT
Make/Model: Engine Make/Model: Aircraft Damage: Number of Engines: Operating Certificate(s): Type of Flight Operation: Reg. Flight Conducted Under:	Substantial 1 None Personal		Crew Pass	Fatal 0 0	Serious 0 0	Minor/None 1 0
Last Depart. Point: Palmer, AK		Condition of Light: Day				
Destination: Palmer, AK		Weather Info Src: Pilot				
Airport Proximity: On Airport/Airstrip		Basic Weather: Visual Conditions				
Airport Name: Cardwell Strip		Lowest Ceiling: None				
Runway Identification: 21		Visibility: 10.00 SM				
Runway Length/Width (Ft): 1200 / 50		Wind Dir/Speed: Calm				
Runway Surface: Dirt; Gravel		Temperature (°C): 21				
Runway Surface Condition: Dry		Precip/Obscuration: No Precipitation				
Pilot-in-Command Age: 75		Flight Time (Hours)				
Certificate(s)/Rating(s)		Total All Aircraft: 2115				
Flight Instructor; Commercial; Single-engine Land		Last 90 Days: Unk/Nr				
Instrument Ratings		Total Make/Model: 115				
Airplane		Total Instrument Time: UnK/Nr				

The commercial certificated pilot was landing a tricycle gear-equipped kit-built experimental airplane on a private airstrip that had an uneven dirt/gravel surface. During the landing roll, the nose 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, and the nose landing gear strut was bent aft. The airplane nosed over, and received structural damage to the fuselage, left elevator, left wing, rudder, and vertical stabilizer. An exam of the runway revealed surface undulations in the area where the nose wheel fork assembly began to scuff the tops of the undulations, producing slight gouge marks that increased in depth 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. An exam of the airplane revealed that the nose gear strut was bent aft and upward from its normal geometry. 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 bottom edge of the threaded nose fork strut is about 4 inches from the ground. A teardrop-shaped fiberglass wheel pant enclosed the accident airplane's nose fork assembly and upper portion of the nose wheel and tire. The distance from the bottom of the wheel pant and ground is about 2 and 7/16 inches. Staff 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 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 collapsed during taxi but the airplane did These nine accidents and incidents occurred on various unpaved surfaces including gravel, turf, soft turf, hard surface not nose over.

## Brief of Accident (Continued)

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with "washboard" bumps, and slight depressions, and they all involved the nose gear strut and fork digging into the ground and the nose gear bending aft. The kit manufacturer posted a letter on their website stating 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.

The NTSB's Structures Study is available at the following address: http://www.ntsb.gov/publictn/2006/RV\_Study.pdf . The NTSB's Photos and Data report that provides details on all of the RV nose-over accidents and incidents can be found at the following URL address: http://www.ntsb.gov/publictn/2006/RV\_Photos.pdf.

Brief of Accident (Continued)

ANC05LA123 File No. 21390	08/12/2005	Palmer, AK	Aircraft Reg No. N63EB	Time (Local): 15:00 ADT
Occurrence #1: Phase of Operation	ON GROUND/WATER ENCOUNTER WITH T n: LANDING - ROLL	ERRAIN/WATER		
Findings 1. (F) TERRAII	N CONDITION - ROUGH/UNEVEN			
Occurrence #2: Phase of Operation	NOSE GEAR COLLAPSED n: LANDING - ROLL			
Findings 2. (C) LANDIN	G GEAR,NOSE GEAR STRUT - BUCKLED			
Occurrence #3: Phase of Operation	NOSE OVER n: LANDING - ROLL			

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this accident as follows.

The loss of nose gear strut/fork-to-ground clearance that led to the collapse of the nose gear strut and nose-over during the landing roll. Factors contributing to the accident were an uneven dirt/gravel surface runway.