RECORD OF CONVERSATION

Eliott Simpson
Aviation Accident Investigator
Western Pacific Region

Date: May 16, 2013
Person Contacted: Captain Andrew H. Benedict. [redacted]
NTSB Accident Number: WPR13FA227

Present:

Eliott Simpson – NTSB
Dan Ridgeway – FAA
David Studtmann – Honeywell
Scott Simpson – Bombardier/Lear
Alan Krahn – Bombardier/Lear (Pilot) – On Phone
Steven Harp – Evergreen International Aviation

Narrative:

During an in-person interview, Mr. Benedict stated the following:

Since retiring from the USAF as a F4 pilot, he has flown for the Evergreen International Airlines part 121 operation for 18 years, as both a captain and first officer in the DC8, as captain in the B727, and captain in the B747 (7,500 hours). Once he turned 60, he moved into the corporate flying department with Evergreen Helicopters, where he has been for 10 years. During this time, he accumulated 3,000 hours experience in the G4. He has a total of 997 hours in the Lear 35A, mostly equipped with the Aeronca thrust reversers. He took recurrent training in August 2012 at the facilities of Flight Safety in Tucson, AZ. He did not specifically recall if the use of emergency braking was part of the training syllabus, however, he did recall using the emergency brakes in the simulator with hydraulic system failure, but never trained with airplane stuck in the air mode due to a double squat switch failure.

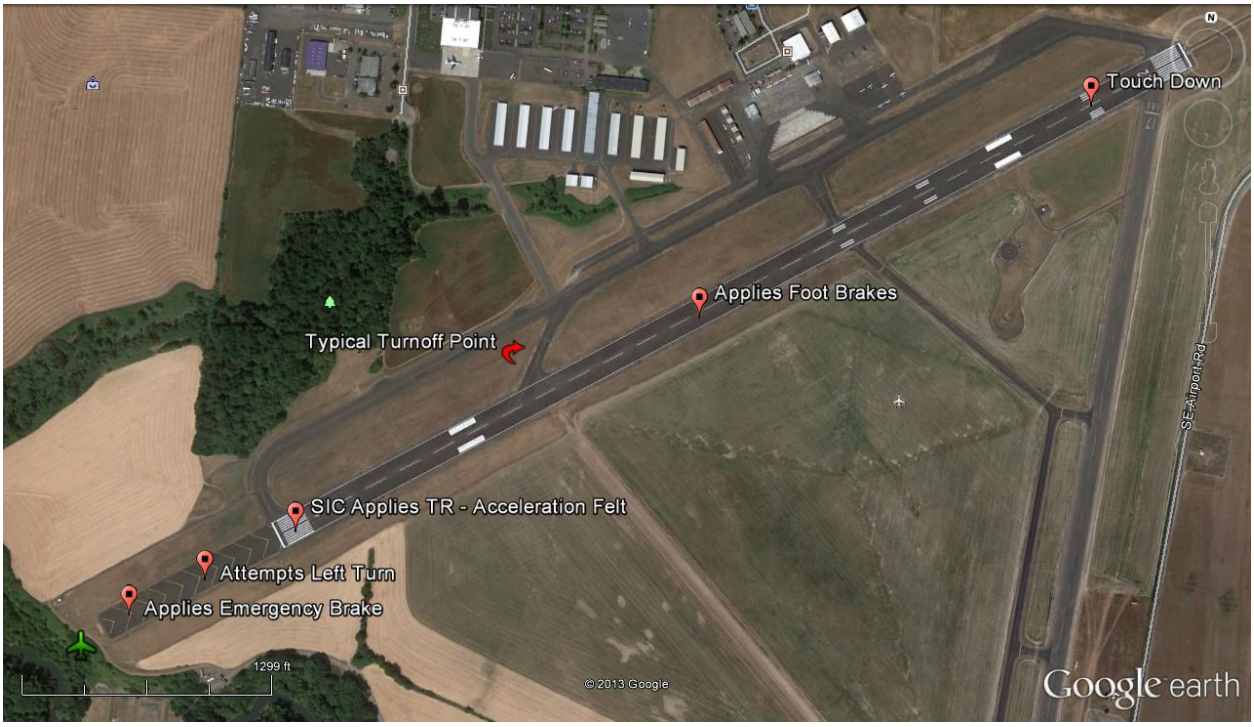
The airplane was owned and operated until March 2013 by Evergreen Helicopters of Alaska, and had subsequently been transferred to Evergreen International Airlines.

On the day of the accident, they departed Grand Junction Colorado after the airplane had received a FMS upgrade. He accomplished his preflight inspection and mechanic Neil Stevens performed a maintenance preflight inspection. They all boarded the airplane, and because it had just come out of maintenance, they were methodical with following checklists. He set the brakes, started the engines and performed an uneventful taxi out to the runway; during taxi, they made multiple turns, and checked the

brake functionality, with no anomalies noted. During taxi check and prior to departure, he pushed the thrust reverse test button, and verified that all four lights illuminated. This test does not deploy the reversers.

They serviced the airplane with fuel, and had 5,000 pounds onboard prior to departure. He estimated 3,500 pound fuel burn during the flight. The takeoff and climb to FL280 was uneventful, with no significant weather enroute.

The approach was uneventful, he and the SIC verified the hydraulic and emergency brake pressure as part of the approach procedures, and the pressures were normal. The SIC lowered the landing gear, and got three 3 green indications. The touchdown point was about 500 feet beyond the threshold of Runway 22. He immediately deployed the spoilers, and felt a sensation indicating that they had deployed; he then set the thrust levers to the reverser deploy position, but did not get a panel deploy light indicating that they had deployed. He stated that it was not unusual for the Aeronca thrust reversers to sometimes not deploy on the first try, so he recycled the levers a second time with still no deploy indication.



About 3,000 feet along the runway as the plane was decelerating, he applied the foot brakes but they did not appear to increase deceleration. The co-pilot also attempted braking, but nothing happened. As the aircraft was decelerating, Mr Benedict continued maintaining pressure on the brakes, because there was good hydraulic pressure , but as they approached the last taxiway at the end of the runway they were still travelling too fast to make the turn. As they approached the runway overrun, he stowed the spoilers, and observed the copilot reach for the thrust levers and move them rapidly into the full back reverser position. As the SIC did so, Mr. Benedict heard a sound similar to the engines producing thrust, and felt the airplane begin to accelerate. He told the co-pilot, “don’t do that, it’s giving us forward thrust”, and the SIC pushed the levers back into the idle detent.

As the airplane entered the overrun, he engaged the steering lock switch using full left peddle input, and attempted to steer the nose wheel to turn to the left and avoid going off the runway, but the airplane did not respond. As they approached the ILS antennas, about 100 feet from reaching the overrun end, he reached for the emergency brake lever and pushed it down initially 2 inches, and then to 3 inches. He felt no response from the emergency brakes, and the airplane rolled off the overrun end, through the ILS antennas, and down a slight embankment. Once the airplane stopped, the front door could not be opened due to blackberry underbrush; therefore, everyone egressed through the rear right side emergency exit.

When questioned further on the operation of the emergency brake lever, he stated that he felt minimal resistance in the brake lever handle, and that he probably could have pushed it further down. He was concerned that the brakes might lock up, and that they might slide out of control with no steering control. He stated that in retrospect, he should have applied the emergency brake earlier in the sequence. He has not had the need to use the emergency brakes in a Lear 35 before, and was not anticipating using emergency brakes, because the plane was slowing down and would have been able to turn off the runway at the end.

When questioned further on the operation of the thrust levers, he stated that when the levers are pulled back to the thrust reverser detent, the reversers will deploy, with an accompanying slight increase in N1 from 50-55; typically, once he sees the deploy light, he then applies aft pressure on the thrust levers and the engine speed accelerates slowing the airplane.

May 13, 2013 LearJet Incident

PIC – Andrew H. Benedict
SIC – Samuel Brown
Mechanic – Neil Stevens

When PIC & SIC reported to airplane, Mechanic Neil Stevens communicated to PIC all preflight inspections and signoffs were completed.

Prior to take off from Grand Junction CO, PIC and SIC completed an extensive pre-flight start, since the plane had been in maintenance, and then completed a normal taxi prior to takeoff. All systems checked out operational, including the brakes and nose gear steering.

Normal flight – no problems noted with airplane.

Before landing checklist accomplished successfully with no abnormalities.

Normal approach by the PIC at 115 knots; normal touchdown at ~800 feet from approach end of runway 22. PIC immediately deployed spoilers; then PIC attempted to deploy thrust reversers which failed to deploy when activated – first and second try. Then, PIC applied brakes; the airplane was then ~2,000 feet from the active runway end; brakes did not work to slow the airplane. The SIC also applied the brakes when entering the 1,000 foot overrun while the PIC continued to apply the brakes; the plane was going ~25 knots. At this point, PIC pulled the emergency brakes, but they did not slow the airplane. PIC attempted to steer the airplane left to avoid going off the overrun, but nose wheel steering was inoperable. At about 10 – 15 knots, the plane departed the overrun straight ahead, partially taking out the runway end ILS, with the plane ending over the end of the runway bank in blackberry bushes.

May 15, 2013 Addition to Report
This morning, the insurance adjuster met with Captain Benedict, Mechanic Stevens, and EIA VP Finance John Irwin. After the official meeting, the mechanic and I were discussing the accident further. During this discussion, the mechanic, who was riding as a passenger on the airplane, commented on what he saw during landing and rollout. He stated that he saw the SIC "raise the reverser levers just prior to going into the overrun". This reminded me that I had told the SIC, "don't that, as it gives us forward thrust". This should be on the cockpit voice recorder. This action increased the airplane speed. The mechanic also said that "he saw me pull the emergency brake lever and push it down". I still do not understand why my action of pulling the emergency brake did not slow the airplane, because this is an independent system that puts direct pressure on the brakes. The mechanic also said that he saw "the nose go to the right and then to the left". I was trying to steer to the left to turn the airplane onto the field to the left which would have avoided the plane going off the runway straight ahead. I do not understand why I couldn't get the nose wheel steering to turn to the left.

Submitted by Captain Andrew H. Benedict
May 15, 2013

RECORD OF CONVERSATION

Eliott Simpson
Aviation Accident Investigator
Western Pacific Region

Date: May 16, 2013
Person Contacted: Samuel Brown. [redacted]
NTSB Accident Number: WPR13LA227

Present:

Eliott Simpson – NTSB
Dan Ridgeway – FAA
David Studtmann – Honeywell
Scott Simpson – Bombardier/Lear
Alan Krahn – Bombardier/Lear (Pilot) – On Phone
Steven Harp – Evergreen International Aviation

Narrative:

During an in-person interview, Mr Brown stated the following:

He holds a commercial certificate, with instrument rating, issued in 2007. He initially flew at a part 61 flight operation, and then flew with Piedmont airlines in 2007 with 250 hours of total flight experience. He then accumulated an additional 2,000 hours with Piedmont in the DH8 as second-in-command. He does not hold a rating for the Lear 35.

He joined Evergreen in July 2011, on a contract basis, flying the Gulfstream and Learjet. All SIC time, and Learjet experience was in an airplane equipped with the Aeronca Thrust reversers.

Flew outbound in the accident airplane, with pilot David Hayes, 2.5 weeks prior. They performed a visual approach, and landed without incident. They used the thrust reversers which operated normally.

Departed on day of the accident with an ETR of 2 hours 3 mins. While enroute, discovered that VOR's on each side were not working as expected, could each track VOR independently, but not between the two. No other airplane problems.

The descent and approach were unremarkable. PIC wanted to see if they could fly a coupled approach with the new FMS, even though they had visual contact. Airplane overshot slightly, and then tracked the glideslope appropriately.

About 10 miles out the PIC disengaged the autopilot and hand flew. Standard callout and checklist; checked hydraulic pressure and emergency air pressure and they were good.

At 1,000 agl, airspeed was 116 knots. The touchdown was smooth, and the PIC deployed spoilers, and thrust reversers, and it became quickly apparent that they were not generating reverse thrust. He could hear the engine spool up but, it was not generating reverse thrust. The PIC tried deployment again. He could not recall the status of the deploy lights. Did hear engine spool up, and took off his headphones to try and listen for their actual deployment. Still 1/3 runway remaining, but not concerned because assumed he had brakes. Once they reached the final taxiway it occurred that they were going too fast to make the turn. As they approached the taxiway, he asked what the PIC was doing, and he said something like, “I need to go in here”. Mr. Brown was not sure what this comment meant. They exited the runway and went into the overrun, and about halfway through the PIC called for the emergency brake. PIC reached down for the lever. Mr. Brown then tried the foot brakes but they were slack, and went to the floor. The left foot pedal was at full deflection. They were travelling about 10-15 knots for the last 200-300 feet before the end of the overrun. They then hit the ILS, and went down the embankment.

They stopped and shutdown engines, turned off the battery, but could not open the main door due to blackberry bushes covering it. They then exited through the emergency door. They returned to turn off the emergency battery, and found that the elevator trim was oscillating due to activation of the stall warning horn. They turned off the horn.

RECORD OF CONVERSATION

Eliott Simpson
Aviation Accident Investigator
Western Pacific Region

Date: May 21, 2013
Person Contacted: Ken Martz. Learjet Mechanic Evergreen Aviation
NTSB Accident Number: WPR13FA227

Present:

Eliott Simpson – NTSB

Narrative:

During a phone interview Mr. Martz stated the following:

- He typically maintains the accident airplane at Evergreen.
- He replaced the stall warning switch in 2012, but does not remember the exact procedures off the top of his head, he follows the maintenance manual.
- He does not recall how he tested in "air-mode" but absolutely never removes the squat switches. He may have pulled a circuit breaker, but does not recall the specific method used.

RECORD OF CONVERSATION

Eliott Simpson
Aviation Accident Investigator
Western Pacific Region

Date: June 20, 2013
Person Contacted: Kevin Bostwick and Scott Smith
NTSB Accident Number: WPR13FA227

Present:

Eliott Simpson – NTSB

Narrative:

Mr Bostwick and Mr Scott were present for an interview at the facilities of West Star Aviation in Grand Junction, Colorado on June 20, 2013.

Kevin Bostwick

Mr Bostwick is the Quality Assurance Manager for West Star in Grand Junction. Five QA Inspectors report to him directly, as well as the three quality control inspectors whom had responsibilities on N22MS while also performing other maintenance functions within the company. His duties also include liaising with the FAA.

He stated that no employees had been disciplined, or released from service, either just before the accident, or following it.

Typically, when a customer order arrives for a major alteration, engineers within West Star produce an engineering design. Once the final design is submitted to the DER for approval, and the workscope is completed, an FAA form 8110-3 is issued by the DER as an FAA approval for the design data.

Mr Bostwick explained that work flow is governed by a computer driven system called, “CORRIDOR.” Amongst other things, the system is used to document the flow of work orders. Mechanics utilize the system to document inspection, and maintenance tasks, as well as steps within each task. Within each work order, fields exist for the mechanic to document his progress and vouch for its completion. Once each task is complete, two inspectors are required to independently inspect and signoff of that it has been completed. Once the series of maintenance items are complete, a QC inspector must signoff the “packet” of work. A QA inspector then signs for the complete work order and the QC Inspector signs off

the associated logbook entries. In the case of N22MS, the QC inspector for avionics was Scott Smith, and airframe was Jason Blust. The QA Inspector was Hugh Hasley & Craig Stout.

Mr Bostwick explained that when a mechanic performs a maintenance task that requires disabling another system (defeating a system) the item is typically physically flagged by the mechanic and documented in the work order or on a Removal and installation form. He showed me an airplane on the Lear maintenance floor that had its landing gear actuators flagged with orange tape, as an example of marking a defeated system. He explained that there are no written policies within West Star for when these systems should be flagged, but that it is rather "tribal knowledge" in the context that all technicians know they must document all maintenance performed as required by the Federal Aviation Regulations. He additionally reported that some maintenance procedures call for disabling systems, and that in those cases, these procedures always outline the reactivation of such systems.

With regard to the specific maintenance performed on N22MS, Mr Bostwick reviewed the work orders following the accident, and interviewed all the mechanics involved. The maintenance instructions did not call for either selecting "air mode" or disabling the squat switches; furthermore, every mechanic stated that they did not disable the squat switches. With regard to a post maintenance flight, he stated that normal procedure requires this, and although nothing to this effect is documented, he understood that Evergreen representatives declined the test, reporting that they would perform it on departure.

After reviewing the work order packet with Mr Bostwick, we discussed the following entry in FAA form 337:

"A successful post installation check out was accomplished IAW Universal Avionics Corp. UNS-1 E & UNS-1 C+ Flight Management Systems Technical Manual, Rev 1. dated *Mayi01/2012"*

Mr Bostwick stated that the checklist for this item was completed, however the checklist was not included in the work order documentation. He further stated that this completed checklist should have been part of the final packet.

Scott Smith

Mr Smith explained his involvement with the maintenance tasks.

He stated that he performed the installation and configuration of the FMS system with Steve Morris. The intention was to replace the UNS 1 FMS system with updated UNS equipment. This required minimal modification to the airplanes wiring, and the installation of a Solid State Data Transfer Unit, SSDTU which was located behind the pedestal (after minor fabrication). He stated that he has performed "hundreds" of such upgrades in the past and none of the installations or testing steps have ever required setting the airplane to air mode. He reported following the Universal Avionics Corp. UNS-1 E & UNS-1 C+ Flight Management Systems Technical Manual checkout procedures directly from a computer. During the initial installation, the system failed section "F. Air Data". He double checked the configuration within the unit, and unable to resolve the issue, brought it to the attention of one a West Star engineer. The engineer reported that the unit was in fact the wrong model for the Lear 35. The FMS unit was subsequently returned to Universal for an exchange. The exchange unit was installed at a later date, and passed the checkout.

I reviewed the electrical installation diagram with Mr Smith, and confirmed that that the FMS unit utilizes a signal input for GND=ON GND, and that the configuration steps require setting the STRUT SWITCH to ANALOG. The engineering diagram does not call for modification of the squat switch wiring.

Mr Smith reported that the only time he recalled ever setting a Lear 35 to air mode was when working on the ground proximity units or mach trim.

Mr Smith also performed the RVSM, pitot static and transponder certification work, while this did require placing the airplane on jacks, this was simply to level it, and air mode was not utilized.

RECORD OF CONVERSATION

Eliott Simpson
Aviation Accident Investigator
Western Pacific Region

Date: May 16, 2013
Person Contacted: Neil Stevens [redacted]
NTSB Accident Number: WPR13FA227

Present:

Eliott Simpson
David Studtmann – Honeywell
Scott Simpson – Bombardier
Alan Krahn – Bombardier (Pilot) – On Phone
Dan Ridgeway – FAA
Scott Olson – Evergreen

He started heavy maintenance at Evergreen in 1986, then went to work in Alaska, and came back in 2002 to work on the Boeing 747. He does not have experience working on the Lear 35A.

On day of accident, he was asked to go with PIC to help with any questions following maintenance, then ride the airplane back. He was sent more to check the maintenance records. He arrived at airplane in morning, talked to mechanics, and checked for leaks etc. Accumulator charge and hydraulic level was good. The logbook paperwork looked clean, but he found a few items in the statement of work that were not in the maintenance release, mainly VOR check RVSM items, so he had them add it to the maintenance release. Altitude hold they did not do, because needed to be done in the air, so the fact that they couldn't do it was put in bold.

The airplane was transition to the new Evergreen Company.

The PIC arrived and they performed a preflight for 35-40 minutes, then the airplane was towed to the departure area. Then fueled and they all boarded. He was seated in the very back seat of the airplane. PIC and SIC started engines, and spent 10 minutes completing checks. During run-up, he felt that the TR's were deployed, heard a sound, but cannot definitely say that they were. He is not that familiar with this engine.

Departed for a smooth two-hour-long flight. He was not wearing a headset. Therefore, all the following observations were visual, as he could not hear anything on the intercom.

Approach, touchdown, could see flight deck, saw PIC grab TR control, heard engine spool up, but did not hear TR deploy. PIC then appeared to try the TR again, but he did not feel any kind of deceleration. No braking, cruising down runway, expecting to have brakes, and as he looked out the window and he saw the last taxi turn off. About that time he saw the SIC try the TR's again. At that point they were slowing down, but once they reached the runway overrun it felt like they were speeding up. He then saw the PIC bend over to pull a red handle. Towards end of the runway, veered right, and then swung back left, and hit the antenna and went down a ditch. Engines were still running as they came to a stop, they were then shutdown. PIC unable to open the main door, so they exited through the emergency door.