

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

January 25, 2013

Cockpit Voice Recorder

Specialist's Factual Report
By Bill Tuccio

1. EVENT

Location: Boyne City, Michigan
Date: October 31, 2012
Aircraft: Piaggio P180, N401WS
Operator: Flagship Private Air
NTSB Number: CEN13FA038

2. GROUP

A group was not convened.

3. SUMMARY

On October 31, 2012, about 0922 eastern daylight time (EDT), a Piaggio P180 Avanti, N401WS, was substantially damaged during a runway excursion while landing on runway 27 at Boyne City Municipal airport (N98) in Boyne City, Michigan. The airplane was registered to Ann Arbor Aviation Partners LLC and operated by Flagship Private Air under the provisions of 14 Code of Federal Regulations Part 135 as a positioning flight. Instrument meteorological conditions prevailed for the flight and an instrument flight plan was filed. The certificated airline transport pilot and copilot were not injured. The flight originated from Willow Run Airport (KYIP) at 0822. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Vehicle Recorder Division's Audio Laboratory for readout.

4. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **L-3/Fairchild FA2100-1020**
Recorder Serial Number: **000219325**

4.1. Recorder Description

Per federal regulation 14 CFR 135.151, a multiengine turbine engine powered aircraft operating under 14 CFR Part 135 manufactured prior to April 7, 2010, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes or 2 hours of CVR operation, depending on the CVR model. This model CVR, the L-3/Fairchild FA2100-1020, is a solid-state CVR that records 2 hours of digital cockpit audio. Specifically, it contains a 2-channel recording of the last 2 hours of operation and separately contains a 4-channel recording of the last 30 minutes of operation. The 2-hour portion of the recording is comprised of one channel of audio information from the cockpit area microphone (CAM) and one channel that combines three audio sources: the captain's audio panel information, the first officer's audio panel information, and the observer pilot's audio panel information and public address system. The 30-minute portion of the recording contains 4 channels of audio data; one channel for each flight crew, one channel for the CAM audio information, and a fourth channel for the public address and third crewmember.

4.2. Recorder Damage

Upon arrival at the audio laboratory, it was evident that the CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

4.3. CVR Channels

The recording consisted of three channels of audio information. Two of the channels contained audio information from the captain's and first officer's audio panels. The quality of these two channels was excellent.¹ One channel contained the cockpit area microphone (CAM) audio information. The quality of this channel was good. The fourth channel did not contain audio, nor was it required by law to do so.

4.4. Timing and Correlation

The times used in this report are expressed as local time of the accident (EDT).

Timing of the transcript was aligned with the takeoff time as provided by the Investigator-in-Charge as 0822 EDT. The IIC take-off time was aligned with the takeoff time as recorded on the CVR at 0103:09 CVR Elapsed Time (time from the beginning of the recording). Using this information, 0718:51 was added to CVR Elapsed Time to convert to EDT.

¹ See Attachment I for the CVR Quality Rating Scale

4.5. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a CVR group did not convene and only this summary report was prepared.

The first 50 minutes of the audio recorded various power cycles to the CVR and mechanics working on the aircraft. The mechanics' discussions included, but were not limited to, the aircraft autofeather system.

At about 0809, the engines were started, the ATIS received, and the first officer received the IFR clearance to Boyne City. The captain then began to taxi, testing the steering system. The crew then performed various checklists while taxiing for takeoff.

At about 0822, the aircraft was cleared for takeoff. While passing 60 knots, the captain noted, "yep she wanted to go to the right initially."

At about 0848, the crew performed the cruise checklist. While in cruise flight, the crew discussed various facets of the Boyne City approach and airport. Items discussed included: the strong crosswind; the captain's preference for runway 27 rather than runway 9 due to the displaced threshold on runway 9; terrain features around the airport; and the approach holding pattern in lieu of a procedure turn.

At about 0857, the AWOS² at the Charlevoix airport was received. The 1255 Zulu AWOS reported winds from 360 degrees at 16 knots gusting to 25 knots, visibility 7 miles, ceiling 1,600 feet broken, 2,000 feet overcast, temperature 4 degrees Celsius, dewpoint 2 degrees Celsius, and the altimeter 29.68 inches of Mercury. The first officer noted the strong crosswind. The first officer then requested the GPS runway 27 approach into Boyne City.

At about 0858, air traffic control (ATC) cleared the aircraft to 4,000 feet. The crew performed the descent checklist. Thereafter, the crew briefed the altitudes on the GPS runway 27 approach and setup the approach on the onboard avionics. The aircraft was further cleared to 3,300 feet.

At about 0907, ATC cleared the aircraft for the GPS runway 27 approach, with an altitude restriction of 3,300 feet until established on a published part of the procedure. The first officer read back the approach clearance and provided ATC a pilot weather report, noting the aircraft was on top of a layer at 3,300 feet, temperature plus 3 degrees Celsius, and no icing.

At about 0908, the first officer briefed the missed approach. The crew then discussed the course reversal on the approach, and how the autopilot would perform various aspects of the approach. The autopilot discussions continued throughout the approach until about 0920.

At about 0911, ATC told the aircraft to switch to the common traffic advisory frequency (CTAF) at Boyne City. The first officer confirmed with ATC they would not be able to contact ATC once on the ground at Boyne City. The first officer then self-announced on CTAF the aircraft was performing the GPS runway 27 approach.

At about 0915, the captain asked for gear down and sounds similar to the gear in transit followed. The crew then performed the approach checklist.

² AWOS means automated weather observation system.

At about 0916, the captain noted the next descent altitude on the approach was 2,500 feet after the WOMOP intersection. The captain then asked for flaps to mid.

At about 0917, the first officer noted 1,540 feet was the next altitude on the approach.

At about 0919, the first officer noted "ground contact." The captain asked the first officer to cancel the IFR flight plan. The first officer then contacted ATC and cancelled the IFR flight plan.

At 0921:02, the first officer self-announced on Boyne City CTAF the aircraft was on final for runway 27. The captain asked the first officer to turn on the lights at the airport, followed by the sound of multiple clicks on the radio. The captain noted the runway was likely wet.

At 0921:28, an automated voice announced, "sink rate sink rate." The captain acknowledged the sink rate. An automated voice then announced "five hundred."

At 0921:37, the captain asked for full flaps.

At 0921:49, the captain noted he would land on the right side of runway initially. The first officer acknowledged.

At 0921:54, a whistling, high to low tone repeated five times. The first officer then said, "I'll be quick on your," and did not complete his sentence.

At 0922:01, the captain said, "oh we hit a couple birds." The first officer agreed.

At 0922:04, the aircraft touched down.

At 0922:06, the first officer noted he was retracting the flaps.

At 0922:07, there was a sound of increased propeller noise.

At 0922:08, the captain made an expression of concern.

At 0922:12, a rumbling sound began, similar to the aircraft exiting a paved surface.

At 0922:17, the captain said, "get ready."

At 0922:18, a loud thunk was recorded, similar to impact. The captain simultaneously loudly exclaimed, "ahh."

At 0922:25, the sound of multiple clicks, similar to switches being operated, was recorded.

At 0922:31, the sound of the engines spooling down was recorded.

At 0922:34, the captain said, "get out of here." The first officer agreed.

At 0922:35, power was removed from the CVR.

Power was reapplied to the CVR at an indeterminate time for the last 30 seconds of the recording. The last 30 seconds recorded an unidentified voice reading numbers 1050, 1055, 1056, 1056, concluding with "twenty one hundred and four pounds."

Bill Tuccio
Vehicle Recorder Division

Attachment I

CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

- Excellent Quality** Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.
- Good Quality** Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.
- Fair Quality** The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.
- Poor Quality** Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.
- Unusable** Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.