

**NATIONAL TRANSPORTATION SAFETY BOARD  
Vehicle Recorders Division  
Washington, D.C. 20594**

February 3, 2000

**Air Traffic Control Recording**

**Sound Spectrum Study**

**Specialist's Report  
by Anna W. Cushman**

**A. ACCIDENT**

Location: Aberdeen, South Dakota  
Date: October 25, 1999  
Time: About 1713 UTC (universal coordinated time)  
Aircraft: Learjet 35, N47BA  
NTSB Number: DCA00MA005

**B. GROUP**          No Group.

**C. SUMMARY**

On October 25, 1999 a Learjet 35, N47BA, impacted terrain near Aberdeen, South Dakota. A certified analog copy of air traffic control (ATC) transmissions recorded on October 25, 1999 at the Jacksonville Air Route Traffic Control Center (ARTCC) was brought to the audio laboratory of the National Transportation Safety Board. The recording was examined to document any aircraft system noises or warning tones that could be heard during radio transmissions from the accident aircraft.

**D. DETAILS OF INVESTIGATION**

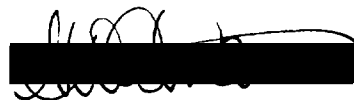
On October 25, 1999 a Learjet 35, N47BA, departed Orlando, Florida on an IFR flight plan to Dallas, Texas. While climbing after departure from Orlando, N47BA was in communication with controllers from the Jacksonville ARTCC. There were seven transmissions from the accident aircraft recorded by Jacksonville ARTCC. Specifically,

there were five separate transmissions from N47BA recorded at the R15 position and two separate transmissions from N47BA recorded at the R16 position.

The initial transmission from N47BA to the controller at the R15 position indicated that N47BA was at 9500 feet, climbing to 14,000 feet. Communications followed regarding N47BA's flight plan and climbing altitudes. At approximately 1327 UTC, the R15 controller asked N47BA to contact Jacksonville center on a frequency of 125.17.

The recording of the R16 position contained communications after 1327 UTC between Jacksonville ARTCC and N47BA. In particular, at approximately 1327 UTC in the R16 recording, N47BA made their initial transmission to the controller on 125.17 and indicated that they were at an altitude of 23,000 feet, climbing to 26,000 feet. The controller at R16 acknowledged the contact and cleared N47BA to climb and maintain 39,000 feet. N47BA immediately acknowledged the request - this was the last communication from the accident aircraft. The aircraft continued on its course until 1713 UTC, at which time it crashed near Aberdeen, South Dakota.

A sound spectrum study was completed on the radio transmissions from N47BA recorded by Jacksonville ARTCC. The transmissions were examined on an audio spectrum analyzer to identify any background sound signatures that could be associated with aural cockpit warning tones or any other aircraft system background noise. The frequency response of the pilot's headset, the aircraft's radios and the tower's recording system were such that there were no background signatures from N47BA recorded on the ATC tape. There was, however, a 600 Hz signal that appeared throughout the recording. Because the frequency was observed throughout the entire tape, it was not attributed to the accident aircraft.



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