NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Washington, D.C. 20594

March 25, 1998

Specialist's Chairman's Factual Report of Investigation

Air Traffic Control Recording

LAX-98-FA-008

A. ACCIDENT

Location: Monterey Airport, Monterey, California

Date: October 13, 1997

Time: 1815 Pacific Daylight Savings Time (PDT)

Aircraft: Long EZ, N555JD

B. GROUP

N/A

C. SUMMARY

A certified audio cassette re-recording of the Monterey local control (tower) was sent to the audio laboratory of the National Transportation Safety Board. The good quality recording was examined to document any engine or propeller sounds that could be heard during radio transmissions from the accident aircraft.

D. DETAILS OF INVESTIGATION

The radio transmissions from the accident aircraft were examined to document any engine or propeller sounds that were present. The first six radio transmissions examined were made when the pilot was in the local pattern doing touch and go landings. The remaining transmissions were made as the aircraft was departing the local traffic pattern.

The radio transmissions were examined on an audio spectrum analyzer to identify any background sound signatures that could be associated with either the engines or the propellers.

The radio transmissions contained sounds that could be associated with the engine or the propeller of the aircraft. These sounds were measured at a frequency range of between 145 Hz. (2nd harmonic) and 217 Hz (3rd harmonic).

The Long EZ aircraft is equipped with a two blade propeller. The engine and propeller normally rotate at a maximum speed of 2700 RPM. At its maximum speed the propeller would produce noise at the fundamental frequency of 90.0 Hz. and at multiple harmonics of this frequency as shown in the following table:

Fundamental Frequency	90 Hz.
Second Harmonic	180 Hz.
Third Harmonic	270 Hz.
Fourth Harmonic	360 Hz.
Fifth Harmonic	450 Hz.
Sixth Harmonic	540 Hz.

The low frequency response of the pilots headsets, the aircraft's radios and the tower's recording system were such that only the second and third harmonics of the rotating blade were recorded on the cassette tape. By assuming that the measured sound is the second or third harmonics of the rotating propeller, this equates to a propeller operating speed of:

Radio Transmission at Time	Measured Frequency in Hertz	Engine speed in RPM
0014:24 UTC	210 Hz. 3rd harmonic	2100 RPM
0018:17 UTC	211 Hz. 3rd harmonic	2110 RPM
0022:26 UTC	217 Hz. 3rd harmonic	2170 RPM
0023:48 UTC	214 Hz. 3rd harmonic	2140 RPM
0024:18 UTC	221 Hz. 3rd harmonic	2210 RPM
0026:57 UTC	147 Hz. 2nd harmonic	2200 RPM
0027:08 UTC	152 Hz. 2nd harmonic	2280 RPM

Radio Transmission at Time	Measured Frequency in Hertz	Engine speed in RPM
0027:59 UTC	145 Hz. 2nd harmonic	2175 RPM
0028:06 UTC	147 Hz. 2nd harmonic	2200 RPM

[redacted]

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