

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

August 21, 2006

Cockpit Voice Recorder Addendum 1

Specialist's Addendum -1 Report By James Cash

A. EVENT

Location: Miami, Florida
Date: December 19, 2005, 14:39
Aircraft: Grumman G-73-T, N2969
Operator: Chalks International
NTSB Number: DCA06MA010

B. GROUP A group was not convened.

C. SUMMARY

On December 19, 2005, a Grumman G-73-T, registration N2969 operated by Chalks International, experienced an in-flight breakup and crashed near Miami, Florida. A tape cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout.

D. DETAILS OF INVESTIGATION

The accident aircraft's CVR chassis was sent to L-3 Communications on January 3, 2006 for evaluation of its functionality. L-3 Communications engineering report of their findings is attached to this report.

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Evaluation Report for Cockpit Voice Recorder Model A100A

A100A 30 Minute Tape CVR P/N 93-A100-83, S/N 52969

This recorder was returned to L-3 Communications, Aviation Recorders, from the NTSB for failure evaluation following post-accident recovery. This evaluation was performed on January 5th, 2006. Tape playback by the NTSB had indicated that the erase-ahead function was not operating.

1. Initial inspection: The recorder was sent to L-3AR after data recovery had been performed by the NTSB. As a result, there was no dust cover and the tape cassette had been removed. There was no shipping damage apparent. Visual inspection of the erase head wiring harness did not indicate any notable problem. All connections were intact. There was corrosion of the tape deck assembly noted as a result of several days of salt water immersion.
2. The continuity to each of the recording head channels and the erase head from the associated circuit cards (Channel 1 Amp, Channel 2 Amp, Channel 3 Amp, Channel 4 Amp, and Bias Generator) was measured. Each of the record head measurements ranged from 210 Ohms to 214 Ohms. While these measurements were more than the expected 200 Ohms, they were not unusual given the salt water immersion exposure. However, the erase head measurement from the bias generator card showed 'open'. Direct measurement of the erase head continuity also showed 'open'. This measurement, which is expected to be about 20 Ohms, is the likely reason for the failure of the erase-ahead functionality of the recorder.
3. Each of the accident recorder circuit cards were cleaned and inserted, individually, into a known good A100A recorder platform. Each of the cards operated as expected. This included each of the channel recording amplifier cards, the bias generator card, and the power supply.


4. The pressure pad tension was measured and found to be within acceptable operational limits
5. Attempts to check the operation of the tape deck mechanism itself were unsuccessful due to salt water immersion corrosion on the mechanical parts.

Conclusion

The recorder electronics (circuit cards) appeared to be in good working order. Continuity resistance checks of the record head showed anomalous, but consistent, measurements for each channel. The anomaly is likely due to the extended salt water immersion exposure. The erase head measurement showed an open condition which is indicative of a failure. This type of failure is very unusual for the A100A recorder. Based on the reported 'overwriting' state of the CVR recorded channels, it is most likely that the erase head failure occurred sometime well before the accident event.

Correct operation of the erase head can be confirmed in at least two ways. First, a casual check of the monitor audio output during normal operation of the recorder may reveal that the previously recorded audio was not being erased ahead of current recording. Second, during any servicing of the CVR, the return to service checks identified in the Component Maintenance Manual would detect the failed erase head. A failure of the erase head would not likely be indicated by the 'Push-to-Test' operation since the recorded test tone amplitude would be detected despite the presence of previously recorded audio.

If there are any questions or comments related to this report, please contact the undersigned at [REDACTED] or e-mail at [REDACTED]. You can also contact Endre Berecz at [REDACTED].


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