

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: May 13, 1981

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Forwarded to:  
Mr. J. Lynn Helms  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591  
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SAFETY RECOMMENDATION(S)  
A-81-57 and -58

Solid-state nonvolatile memories are now available as viable candidates for use as the recording medium in flight recorders. Solid-state is a superb technology for this application since it will result in recorders with no moving parts that are virtually maintenance free.

Solid-state is coming into its own in the computer memory field in general. Available now is a bubble memory board which provides 1.3 million bits of nonvolatile storage. In the aircraft data recording field, several manufacturers have built prototype solid-state crash recorders for United States military applications.

Appendix B, 14 CFR 121 requires that sampled data for a given aircraft parameter be recorded at a given maximum interval (usually one second, depending on the parameter). This technique works well for magnetic tape digital flight data recorders (DFDR) which employ a continuously moving recording medium. However, solid-state DFDR's have no moving medium, and data are stored in physical locations in circuit chips. Implementation of the fixed recording interval specified in the current regulation is not efficient for use with the solid-state recorder. Solid-state memories are most efficient when used to store compressed data.


Currently, several methods are available to achieve data compression, and any of these could well be a viable means of recording accident data. Such methods should be permitted if the manufacturer can prove during certification that his technique allows precise and accurate reconstruction of the required parameters over the specified ranges and that the recorded data are adequate for accident investigation purposes.

Accordingly, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Amend 14 CFR 121.343 to allow use of digital flight data recorders (DFDR) which employ some form of data compression if the manufacturer can demonstrate during aircraft certification that upon recorder readout the required parameters can be reconstructed to the accuracy and ranges specified in Part 121, appendix B, and that the recorded data are adequate for accident investigation purposes. (Class II, Priority Action) (A-81-57).

Amend column 4, "Recording Interval Maximum (Seconds)," appendix B, 14 CFR 121 so that it applies to: (1) the recording interval of continuously recording machines, such as the currently used magnetic tape digital flight data recorder and (2) the data sampling intervals of DFDR's employing data compression. (Class II, Priority Action) (A-81-58)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.

  
By: James B. King  
for Chairman