



ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: COCKPIT VOICE RECORDER INSTALLATIONS

1. **PURPOSE.** This advisory circular sets forth one acceptable means of compliance with provisions of FAR 25.1457(b), (e), and (f) pertaining to area microphones, cockpit voice recorder location, and erasure features.
 2. **CANCELLATION.** AC 25.1457-1, dated 7 April 1965, is cancelled.
 3. **BACKGROUND.** The National Transportation Safety Board has experienced difficulty while trying to determine the cause of certain accidents because vital information contained on the area microphone channel of the cockpit voice recorder has been obliterated by incoming loudspeaker information. Furthermore, it has been found that in many installations, wherein the intelligibility was marginal during certification, subsequent deterioration has rendered the recovered area microphone audio extremely poor and often unusable even in the presence of limited loudspeaker interference. Since the interfering loudspeaker audio may often be of greater magnitude at the area microphone than the crew members' conversation, care should be given to the location of these system components. It is recognized that because of space limitations an ideal location is difficult to achieve; however, in the interest of safety, particular effort should be made toward elimination of this problem.
 4. **MICROPHONE INSTALLATION CRITERIA.** The following are considered acceptable means of meeting the requirements of FAR 25.1457(b):
 - a. **Microphone Location.** The most desirable location for the microphone is forward of a vertical plane oriented laterally through the pilot's and copilot's normal sitting position. The microphones should face the crew members. When circumstances leave little choice of loudspeaker and microphone locations, choose microphones which have improved directional characteristics and/or noise cancelling characteristics.
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- b. Loudspeaker Location. Loudspeakers should be located such that the path length for acoustical energy from the loudspeakers to the area microphone exceeds the acoustical path length from the first and second pilots to the area microphone. This may be done by mounting the loudspeakers in the lower forward cockpit extremities such as the pedestal or leg area, and with consideration given to directing the acoustical energy for the most favorable combination of maximum communications intelligibility and minimum pickup by the area microphone.
 - c. Loudness Controls. If possible, the loudness controls of the cockpit loudspeakers should be adjusted to the point where crew conversations become intelligible on the area mike channel. This position should be determined under the most adverse of normal operating conditions.
5. RECORDER LOCATION. The installation of a cockpit voice recorder is considered to comply with FAR 25.1457(e) when the following criteria have been met:
- a. The longitudinal location is within the aft 15% of the pressurized length of the fuselage or aft of the rear pressure bulkhead.
 - b. The vertical location, measured at the base of the recorder, is at least 24 inches above the lower fuselage outer contour at the airplane centerline.
 - c. The location provided minimizes the probability of damage by baggage, cargo, aft engines, and structural collapse.
6. BULK ERASURE. If this feature is provided, the following criteria are considered acceptable in demonstrating compliance with FAR 25.1457(f):
- a. The installation should be such that any probable malfunction will not cause erasure of the recording medium.
 - b. If the erase feature is connected through the airplane's ground control relay, squat switch, or ground power relay, an additional series switch should be provided which will necessitate a manual operation to initiate erasure action.


Director,
acting Flight Standards Service