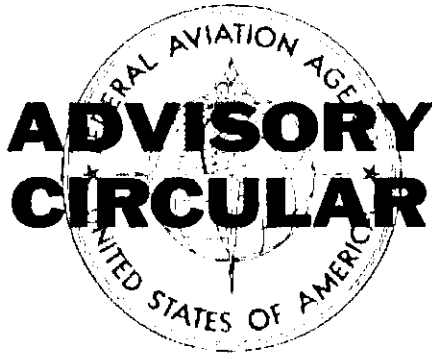


Federal Aviation Agency



AC NO : AC 20-12

AIRCRAFT

EFFECTIVE :

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**SUBJECT : ACCEPTABLE FUNCTIONAL AND INSTALLATION CRITERIA FOR AIRCRAFT
TYPE CERTIFICATION APPROVAL OF THE INSTALLATION OF AIRBORNE
COMMUNICATION, NAVIGATION, AND AUTOMATIC FLIGHT CONTROL SYSTEMS**

1. PURPOSE. This circular is to advise all concerned parties of the intended future plans of the Agency regarding the subject matter.
2. GENERAL.
 - a. There has been a need for acceptable standardized methods of showing compliance with the Civil Air Regulations pertaining to communication, navigation, and automatic flight control systems. Although individual components of equipment have been and are being approved in accordance with existing regulations, there have been few standardized acceptable methods of approving complete and installed systems of various types. To alleviate this need, the Agency intends, within the near future, to issue advisory circulars covering acceptable installation criteria and flight test methods which can be used for showing that required systems comply with pertinent Civil Air Regulations. In addition, other advisory circulars will be issued covering similar criteria and methods applicable to optional systems (those not required by airworthiness or operational Civil Air Regulations).
 - b. The acceptable methods, to be incorporated into advisory circulars, should be utilized in conjunction with existing Agency procedures applicable to the issuance of aircraft type certificates, supplemental type certificates and other approvals. The airborne equipment and systems to which these methods apply are approved in accordance with one or more of the following:
 - (1) As a part of the original aircraft type design by a finding of compliance with the applicable airworthiness rules with respect to detail design and installation requirements.

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- (2) Under applicable Technical Standard Order or other government (including military) specifications which have been found not to conflict with airworthiness rules, and with a finding of compliance with the applicable airworthiness rules with respect to installation requirements.
 - (3) As a part of the aircraft type design, as modified by a Supplemental Type Certificate under the provisions of CAR Section 1.25, with a finding of compliance with the airworthiness rules under which the aircraft was type certificated.
 - (4) Under the provisions of CAR Section 1.55 as a replacement or modification part and with a finding of compliance with the airworthiness rules under which the aircraft was type certificated.
3. AFFECTED SYSTEMS. It is expected that an advisory circular will be issued for at least each of the following systems, but not in the order listed:
- a. Automatic Flight Control Systems
 - b. Automatic Direction Finder (ADF)
 - c. Communication Systems, Very High Frequency (VHF) and High Frequency (HF)
 - d. Distance Measuring Equipment (DME)
 - e. Doppler Navigation
 - f. Flight Director System
 - g. Long Range Navigation (LORAN)
 - h. Instrument Failure Warning Systems
 - i. Inertial Guidance System
 - j. Instrument Landing System (ILS)
 - k. Low Range Radio Altimeter System
 - l. Marker Beacon

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- m. Short Range Hyperbolic Navigation (DECCA)
 - n. Speed Control Approach Takeoff System (SCAT)
 - o. Transponder
 - p. Very High Frequency Omirange (VOR)
 - q. Vortac Pictorial Display System
 - r. Weather and Collision Avoidance Radar
 - s. Pictorial Navigation Display System
4. REFERENCES. Civil Air Regulations (airworthiness) 1, 3, 4b, 6, 7, 9a, and 18; Regulations of the Administrator, Part 514 (Appliances); Civil Air Regulations (operations) 40, 41, 42, and 46; Federal Aviation Regulations 91, 95, and 97.
5. CRITERIA. The type certification evaluation and flight test methods for each system will consider the purpose for which the installed system is intended, accuracy, reliability, failsafe features, indications and/or displays within critical environments. In addition, it will consider the compatibility and airworthiness of airborne installations with the National Air Navigation System in relation to operational considerations and those of the Air Traffic Control System.



George S. Moore

Director

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