

# Federal Aviation Agency

## ADVISORY CIRCULAR

AC NO: 20-41

AIRCRAFT

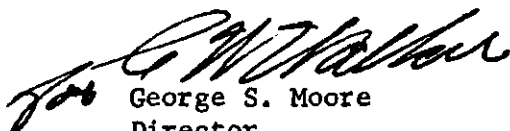
EFFECTIVE :

8/30/65

**SUBJECT : REPLACEMENT TSO RADIO EQUIPMENT IN TRANSPORT AIRCRAFT**

1. **PURPOSE.** This circular sets forth an acceptable means for complying with rules governing transport category aircraft installations in cases involving the substitution of technical standard order radio equipment for functionally similar radio equipment.
2. **REFERENCE REGULATIONS.** § § 21.95, 21.113, 21.115, 25.1307, 29.1307, 43.13, 121.345, and 121.379 of the Federal Aviation Regulations.
3. **BACKGROUND.** Under the referenced rules the determination of compliance with the regulations may require that an aircraft be flown for an operational check of any replacement parts or installations. The question has been raised, with respect to the substitution of TSO radio equipment for functionally similar radio equipment, either by the aircraft manufacturer as an alternate or by an owner, whether there were circumstances in which the replacement could be considered acceptable without a flight check. The acceptable means of compliance in paragraph 4 deals with this question and is applicable to an evaluation of replacements under the alteration performance rules of § 43.13, a minor change in type design per § 21.95 or supplemental type certificate procedures of § § 21.113 and 21.115. When the substitution of non-TSO radio equipment is involved the same criteria can be used to determine if a flight check is necessary. However, additional substantiation may be required to substantiate the performance of non-TSO radio equipment.
4. **ACCEPTABLE MEANS OF COMPLIANCE.** In the case of an aircraft alteration involving the substitution of TSO radio equipment for functionally similar radio equipment, an acceptable means of compliance with applicable airworthiness regulations without the aircraft being flight checked, is to:
  - a. Show, by means of ground functional tests, analyses, drawings, descriptive data, or combination of these, that

- (1) The TSO radio equipment, and its installation, meet the airworthiness regulations which were applicable to the replaced radio equipment;
  - (2) The connections (electrical, electronic, or mechanical) between the TSO radio equipment and other equipment in the aircraft either remain the same or, if these connections are modified, the modification does not affect the TSO status of the TSO radio equipment; and
  - (3) The radiation system (including transmission lines), and other electrical or electronic aircraft equipment that connect to the TSO radio equipment, either remain the same or, if modified, the modification does not adversely affect the performance of such systems or equipment and the TSO radio equipment; and
- b. Include necessary information in the appropriate part of the Federal Aviation Agency approved Airplane Flight Manual concerning any reduction in equipment capability as determined from the evaluation outlined in item 4.a.



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