



Technical Standard Order

Subject: TSO-C38d, VHF RADIO COMMUNICATIONS RECEIVING EQUIPMENT OPERATING WITHIN THE RADIO FREQUENCY RANGE 117.975 TO 137.000 MEGAHERTZ

a. Applicability.

(1) Minimum performance standard. This technical standard order (TSO) prescribes the standard that VHF radio communications receiving equipment must meet to be identified with the applicable TSO marking. New models of VHF radio communications receiving equipment that are to be so identified and that are manufactured on or after the date of this TSO must meet the minimum performance standards set forth in RTCA, Inc. Document No. DO-186, "Minimum Operational Performance Standards for Airborne Radio Communications Equipment Operating Within the Radio Frequency Range 117.975 - 137.000 MHz," Section 2.0, Change No. 1, dated March 1985.

(2) Deletion. Section 2.1.3. (Compliance with Federal Communications Commission (FCC) rules is not a precondition to obtain an authorization under this TSO; however, the FCC requires that equipment comply with its applicable rules.)

(3) Addition. If the equipment design includes a digital computer, the software must be developed in accordance with RTCA Document No. DO-178A, "Software Considerations in Airborne Systems and Equipment Certification," dated March 1985. In accordance with RTCA/DO-178A, the manufacturer shall submit a Software Aspects of Certification Plan (RTCA/DO-178A Document No. 14) for review and approval.

NOTE: The Federal Aviation Administration (FAA) recommends that this plan be submitted early in the software development process. Early submittal will allow the manufacturer to resolve FAA issues with the software aspects of certification described in the plan (e.g., partitioning, determination of software levels, etc.).

(4) Environmental standard. The conditions and procedures prescribed in RTCA Document No. DO-160C, "Environmental Conditions and Test Procedures for Airborne Equipment" dated December 1989 are to be used in lieu of RTCA Document No. DO-160A, "Environmental Conditions and Test Procedures for Airborne Equipment," dated January 1980.

(5) Exception. This TSO includes only receiving equipment with 25 kHz channel separation (Class C).

b. Marking. In addition to the marking specified in Federal Aviation Regulations (FAR) Section 21.607(d), the following information shall be legibly and permanently marked on the equipment manufactured in compliance with an authorization under this TSO:

(1) The name of the manufacturer and the TSO number on each separate component of the equipment.

(2) With regard to FAR Section 21.607(d)(2), the part number is to include hardware and software identification or separate part numbers for hardware and software. Either approach is to include a means for showing modification status and software level(s).

NOTE: If multiple software levels are marked, then the installation instructions must identify the software level for each function.

c. Data Requirements.

(1) In addition to FAR Section 21.605, the manufacturer shall furnish the Manager, Aircraft Certification Office (ACO), FAA, having purview of the manufacturer's facilities, one copy each of the following technical data:

(i) Operating instructions.

(ii) Equipment limitations.

(iii) Installation procedures and limitations.

(iv) Schematic drawings as applicable to the installation procedures.

(v) Wiring diagrams as applicable to the installation procedures.

(vi) Specifications.

(vii) List of the major components (by part number) that make up the equipment complying with the standards prescribed in this TSO.

(viii) An Environmental Qualification Form as described in RTCA/DO-160C.

(ix) The appropriate documentation to support the verification of the computer software to the established level(s).

(2) In addition to those required data that are to be furnished directly to the FAA, each manufacturer shall have available for review by the Manager of the ACO having purview of the manufacturer's facilities, the following technical data:

- (i) A drawing list, enumerating all the drawings and process specifications that are necessary to define the equipment's design.
- (ii) The functional test specification to be used to test each manufactured article to ensure compliance with this TSO.
- (iii) Equipment calibration procedures.
- (iv) Corrective maintenance procedures (within 12 months after TSO authorization issuance).
- (v) Schematic drawings for the equipment.
- (vi) Wiring diagrams for the equipment.
- (vii) The appropriate documentation to support the validation of the computer software to the established level(s) for particular aircraft.
- (viii) The results of the environmental qualification tests conducted in accordance with RTCA/DO-160C.

d. Data to be Furnished with Manufactured Articles.

(1) One copy of the data and information specified in paragraphs (c)(1)(i) through (viii) of this TSO, and the instructions for periodic maintenance and calibration that are necessary for continued airworthiness must go to each person receiving for use one or more articles manufactured under this TSO.

(2) The existence of TSO approval with the article displaying required marking does not automatically constitute the authority to install and use the article. Each article must include a note that states the following:

“The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install this article on or within a specific type or class of aircraft to determine that the aircraft operating conditions are within the TSO standards. The article may be installed only if further evaluation by the user/installer documents an acceptable installation and is approved by the Administrator.”

e. Availability of Reference Documents.

(1) Copies of RTCA Documents Nos. DO-186, DO-178A, and DO-160C may be purchased from the RTCA, Inc., 1140 Connecticut Avenue, NW, Suite 1020, Washington, DC 20036.

(2) Federal Aviation Regulations Part 21, Subpart O, may be purchased from the Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325.

(3) Advisory Circular 20-110, "Index of Aviation Technical Standard Orders," may be obtained from the US Department of Transportation, Utilization and Storage Section, M-443.2, Washington, DC 20590.

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