

FEDERAL AVIATION AGENCY

Washington 25, D. C.

TECHNICAL STANDARD ORDER

Regulations of the Administrator

Part 514

SUBJECT: VOR Radio Receiving Equipment

TSO-C40a

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Technical Standard Orders for Aircraft Materials,  
Parts, Processes, and Appliances

Part 514 contains minimum performance standards and specifications of materials, parts, processes, and appliances used in aircraft and implements the provisions of sections 3.18, 4a.31, 4b.18, 6.18 and 7.18 of the Civil Air Regulations. The regulation uses the Technical Standard Order system which, in brief, provides for FAA-industry cooperation in the development of performance standards and specifications which are adopted by the Administrator as Technical Standard Orders, and a form of self-regulation by industry in demonstrating compliance with these orders.

Part 514 consists of two subparts. Subpart A contains the general requirements applicable to all Technical Standard Orders. These provisions are summarized below for the convenient reference of the public. Subpart B contains the technical standards and specifications to which a particular product must conform, and each Technical Standard Order is set forth in the appropriate section of Subpart B. The subject Technical Standard Order is printed below. ANY TECHNICAL STANDARD ORDER MAY BE OBTAINED BY SENDING A REQUEST TO FAA, WASHINGTON 25, D. C.

SUBPART A--GENERAL

This subpart provides, in part, that a manufacturer of an aircraft material, part, process, or appliance for which standards are established in Subpart B, prior to its distribution for use on a civil aircraft of the United States, shall furnish a written statement of conformance certifying that the material, part, process, or appliance meets the applicable performance standards established in this part. The statement of conformance must be signed by a person duly authorized by the manufacturer, and furnished to the Chief, Engineering and Manufacturing Division, Bureau of Flight Standards, Federal Aviation Agency, Washington 25, D. C.

Subpart A also requires appropriate marking of material, parts, processes, and appliances as follows:

- (a) Name and address of the manufacturer responsible for compliance,
- (b) Equipment name, or type or model designation,
- (c) Weight to the nearest pound and fraction thereof,
- (d) Serial number and/or date of manufacture, and
- (e) Applicable Technical Standard Order (TSO) number.

In addition, Subpart A provides that no deviation will be granted from the performance standards established in Subpart B, and that the Administrator may take appropriate action in the event of noncompliance with Part 514.

SUBPART B

§ 514.38 VOR radio receiving equipment operating within the radio-frequency range of 108-118 megacycles (for air carrier aircraft) - TSO-C40a--(a) Applicability--(1) Minimum performance standards. Minimum performance standards are hereby established for airborne VOR radio receiving equipment operating within the radio-frequency range of 108-118 megacycles which is to be used on civil aircraft of the United States engaged in air carrier operations. New models of airborne VOR radio receiving equipment manufactured for use on civil air carrier aircraft on or after September 1, 1959, shall meet the minimum performance standards as set forth in Radio Technical Commission for Aeronautics' Paper entitled "Minimum Performance Standards Airborne VOR Receiving Equipment Operating Within the Radio Frequency Range of 108-118 Megacycles," as amended, (Paper 225-55/DO-69 dated December 13, 1955, and amendment, Paper 253-58/EC-363 dated November 13, 1958).<sup>1/</sup> Radio Technical Commission for Aeronautics' Paper 100-54/DO-60<sup>1/</sup> which is incorporated by reference in and thus is a part of Paper 225-55/DO-69 has been amended by Paper 256-58/EC-366 dated November 13, 1958. This amendment is also a part of the minimum performance standards. An exception to these standards is covered in subparagraph (2) of this paragraph.

(2) Exception. (i) Radio Technical Commission for Aeronautics' Paper 100-54/DO-60, and amendment Paper 256-58/EC-366 dated November 13, 1958, outlined environmental test procedures for equipment designed to operate under three environmental test conditions as specified therein under Procedures A, B, and C. Only airborne VOR radio receiving equipment which meets the operating requirements as outlined under Procedure A or Procedure B of Paper 100-54/DO-60, as amended, is eligible under this section.

(ii) The vibration values specified below may be used for equipment designed exclusively for installation on the instrument panel of aircraft in lieu of those specified in Paper 100-54/DO-60 as amended. No shock mounting shall be used during the conduct of this test if the vibration values specified below are used.

Amplitude: 0.01" (0.02" total excursion)  
Frequency: Variable 5-50 cps  
Maximum Acceleration: 1.5 g

(iii) Equipment which is designed exclusively for installation on the instrument panel of aircraft need not be subjected to the shock requirements outlined in Paper 100-54/DO-60 as amended.

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<sup>1/</sup>Copies of these papers may be obtained from the RTCA Secretariat, Room 1072, T-5 Building, 16th and Constitution Ave., N. W., Washington 25, D. C. Paper 225-55/DO-69, 30 cents per copy; Paper 100-54/DO-60, 20 cents per copy.

(iv) Indicating instruments which are a part of the system, but which are not designed exclusively for installation on the instrument panel of aircraft, may also be tested to the vibration requirements specified in subdivision (ii) of this subparagraph and need not be subjected to the shock requirements outlined in Paper 100-54/DO-60 as amended.

(b) Marking. In addition to the information required in Subpart A, equipment which has been designed to operate over the environmental conditions as outlined in Procedure A of RTCA Paper 100-54/DO-60, as amended, shall be marked as Category A equipment. Equipment which has been designed to operate over the environmental conditions outlined in Procedure B of this same paper shall be marked as Category B equipment. Equipment which has been designed exclusively for installation on the instrument panel of aircraft and which meets only the amended vibration requirements outlined above shall be identified with the letters I.P. following the category of equipment, such as CAT. A - I.P.

(c) Data requirements. One copy each of the manufacturer's operating instructions, schematic diagrams, and installation procedures shall be furnished the Chief, Engineering and Manufacturing Division, Federal Aviation Agency, Washington 25, D. C., with the statement of conformance.

(d) Previously approved equipment. Airborne VOR radio receiving equipment approved prior to September 1, 1959, may continue to be manufactured under the provisions of its original approval.

(e) Effective date. September 1, 1959.