



Technical Standard Order

**Subject: TSO-C41d, AIRBORNE AUTOMATIC DIRECTION FINDING
(ADF) EQUIPMENT**

a. Applicability.

(1) Minimum Performance Standard. This Technical Standard Order (TSO) prescribes the minimum performance standard that automatic direction finding equipment must meet in order to be identified with the applicable TSO marking. This TSO has been prepared in accordance with procedural rules set forth in Subpart O of Federal Aviation Regulations (FAR) Part 21. Automatic direction finding equipment that is to be so identified and that is manufactured on or after the date of this TSO must meet the standards set forth in Radio Technical Commission for Aeronautics (RTCA) Document No. DO-179, "Minimum Operational Performance Standards for Automatic Direction Finding (ADF) Equipment," Section Two (2), dated May 13, 1982.

(2) Environmental Standard. The conditions and procedures prescribed in RTCA Document No. DO-160B, "Environmental Conditions and Test Procedures for Airborne Equipment," dated July 1984 are to be used in lieu of RTCA Document No. DO-160A, "Environmental conditions and Test Procedures for Airborne Equipment" dated January 1980 which is incorporated as a reference in RTCA DO-179.

(3) Addition. If the equipment design implementation includes a digital computer, the computer software package must be validated and verified in a manner acceptable to the Administrator. An acceptable means of compliance for validation and verification of the computer software package is contained in RTCA/DO-178, "Software Considerations in Airborne Systems and Equipment Certification," dated November 18, 1981.

b. Marking.

(1) In addition to the marking specified in FAR § 21.607(d), the following information shall be legibly and permanently marked on the major equipment components:

(i) The environmental categories in which it has been qualified to operate in accordance with RTCA document DO-160B.

(ii) The TSO output class marking is as follows:

<u>Class</u>	<u>Category as defined in §2.2, DO-179</u>
A	A
B	B

Equipment which complies with both Class A and Class B requirements need only be marked as Class A equipment.

(iii) With regard to FAR § 21.607(d)(2), the part number is to include hardware and software identification or a separate part number may be utilized for hardware and software. Either approach must include a means for showing modification status.

(2) Each separate component of equipment that is manufactured under this TSO (antenna, receiver, transmitter, etc.) must be permanently and legibly marked with at least the name of the manufacturer and the TSO number.

c. Data Requirements.

(1) In addition to FAR § 21.605, the manufacturer must furnish the Manager, Aircraft Certification Office (ACO), Federal Aviation Administration (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 system complying with the standards prescribed in this TSO.
- (viii) Manufacturer's TSO qualification test report.
- (ix) Nameplate drawing.

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

(i) A drawing list, enumerating all the drawings and processes that are necessary to define the article design.

(ii) The functional test specification to be used to test each production article to ensure compliance with this TSO.

(iii) Equipment calibration procedures.

(iv) Corrective maintenance procedures (within 12 months after TSO authorization).

(v) Schematic drawings.

d. Data to be Furnished with Manufactured Units. One copy of the data and information specified in paragraphs (c)(1)(i) through (vii) of this TSO and instructions for periodic maintenance and calibration which are necessary for continued airworthiness must go to each person receiving for use one or more articles manufactured under this TSO.

e. Previously Approved Equipment. Airborne radio receiving and direction finding equipment approved prior to the effective date of this TSO may continue to be manufactured under the provision of its original approval.

f. Availability of Reference Documents.

(1) Copies of RTCA Document Nos. DO-179, DO-160B, and DO-178 may be purchased from the Radio Technical Commission for Aeronautics Secretariat, One McPherson Square, 1425 K Street, N.W., Suite 500, Washington, DC 20005.

(2) Federal Aviation Regulations, Part 21, Subpart O, and Advisory Circular 20-110, "Index of Aviation Technical Standard Orders," may be reviewed at the FAA Headquarters in the Office of Airworthiness, Aircraft Engineering Division (AWS-110), and at all regional ACO's.

/S/ Joseph A. Pontecorvo
Acting Director of Airworthiness