

FEDERAL AVIATION AGENCY

Washington 25, D. C.

TECHNICAL STANDARD ORDER

Regulations of the Administrator

Part 514

SUBJECT: **AIRBORNE ATC TRANSPONDER EQUIPMENT
(FOR AIR CARRIER AIRCRAFT)**

TSO-C74

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, Flight Standards Service, Federal Aviation Agency, Washington 25, D. C.

Subpart A also requires appropriate marking of materials, 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

§ 514.80 Airborne ATC transponder equipment (for air carrier aircraft) - TSO-C74--(a) Applicability - (1) Minimum performance standards. Minimum performance standards are hereby established for airborne ATC transponder equipment which is to be used on civil aircraft of the United States engaged in air carrier operations. New models of airborne ATC transponder equipment manufactured for use on civil air carrier aircraft on or after the effective date of this section shall meet the standards as set forth in Radio Technical Commission for Aeronautics Papers 181-61/DO-112^{1/} dated December 14, 1961, and 120-61/DO-108^{1/} dated July 13, 1961, with the exception to these standards listed in subparagraph (2) of this paragraph.

(2) Exceptions. Radio Technical Commission for Aeronautics Paper 120-61/DO-108 outlines various test procedures which define the environmental extremes over which the equipment shall be designed to operate. Some test procedures have categories established and some do not. Where categories are established, only equipment which qualifies under the following categories, as specified in RTCA Paper 120-61/DO-108, is eligible under this order:

- (i) Temperature-Altitude Test - Categories A, B, C, or D.
- (ii) Humidity Test - Categories A or B.
- (iii) Vibration Test - Categories A, B, C, E, or F.
- (iv) Audio-Frequency Magnetic Field Susceptibility Test - Categories A or B.
- (v) Radio-Frequency Susceptibility Test - Category A.
- (vi) Emission of Spurious Radio-Frequency Energy Test - Category A.

(b) Marking. (1) In addition to the markings specified in Subpart A, the equipment shall be marked to indicate the environmental extremes over which it has been designed to operate. There are seven environmental test procedures outlined in RTCA Paper 120-61/DO-108 which have categories established. These shall be identified on the nameplate by the words "environmental categories" or, as abbreviated, "Env. Cat." followed by seven letters which identify the categories designated in RTCA Paper 120-61/DO-108. Reading from left to right, the category designations shall appear on the nameplate in the following order, so that they may be readily identified:

- (i) Temperature-Altitude Test Category.
- (ii) Humidity Test Category.
- (iii) Vibration Test Category.

^{1/}Copies of these papers may be obtained from the RTCA Secretariat, Room 1072, T-5 Building, 16th & Constitution Avenue, N. W., Washington 25, D. C., Paper 181-61/DO-112, 55 cents per copy; Paper 120-61/DO-108, 75 cents per copy.

- (iv) Audio-Frequency Magnetic Field Susceptibility Test Category.
- (v) Radio-Frequency Susceptibility Test Category.
- (vi) Emission of Spurious Radio-Frequency Energy Test Category.
- (vii) Explosion Test.

Equipment which meets the explosion test requirement shall be identified by the letter "E". Equipment which does not meet the explosion test requirement shall be identified by the letter "X".

(2) Equipment which is intended for installation in aircraft which operate at altitudes above 15,000 feet shall be identified on the nameplate as Class I equipment.

(3) Equipment which is intended for installation in aircraft which operate at altitudes not exceeding 15,000 feet shall be identified on the nameplate as Class II equipment. In some cases such as under the Temperature-Altitude Test Category, a manufacturer may wish to substantiate his equipment under two categories. In this case, the nameplate shall be marked with both categories in the space designated for that category by placing one letter above the other in the following manner: Env. Cat. ^ADABAAAX Class I.

(4) Each major component of equipment (antenna, power supply, etc.) shall be identified with at least the manufacturer's name, TSO number, and the environmental categories over which the equipment component is designed to operate.

Note: A typical nameplate identification would be as follows:

Env. Cat. DABAAAX
Class I

(c) Data requirements. (1) The manufacturer shall maintain a current file of complete design data.

(2) The manufacturer shall maintain a current file of complete data describing the inspection and test procedures applicable to his product. (See paragraph (d) of this section.)

(3) Six copies each, except where noted, of the following shall be furnished to the Chief, Engineering and Manufacturing Division, Flight Standards Service, Federal Aviation Agency, Washington 25, D. C.

- (i) Manufacturer's operating instructions and equipment limitations.
- (ii) Installation procedures with applicable schematic drawings, wiring diagrams, and specifications. Indicate any limitations, restrictions, or other conditions pertinent to installation.
- (iii) One copy of the manufacturer's test report.

(d) Quality control. Airborne ATC transponder equipment shall be produced under a quality control system, established by the manufacturer, which will assure that each equipment is in conformity with the requirements of this section and is in a condition for safe operation. This system shall be described in the data required under paragraph (c)(2) of this section. A representative of the Administrator shall be permitted to make such inspections and tests at the manufacturer's facility as may be necessary to determine compliance with the requirements of this section.

(e) Previously approved equipment. Airborne ATC transponder equipment approved prior to the effective date of this section may continue to be manufactured under the provisions of its original approval.

(f) Effective date. June 15, 1962.