



Number: CTSO-C66c  
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Approved by: Yang Zhenmei

## China Civil Aviation Technical Standard Order

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This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

### Distance Measuring Equipment(DME) Operating within the Radio Frequency Range of 960-1215 Megahertz

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#### **1. Purpose.**

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for a distance measuring equipment(DME) operating within the radio frequency range of 960-1215 megahertz CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that DME must first meet for approval and identification with the applicable CTSO marking.

#### **2. Applicability.**

This CTSO affects new application submitted after its effective date. Major design changes to article approved under this CTSO will require a new authorization in accordance with section 21.310 of CCAR-21R3.

#### **3. Requirements**

New models of DME identified and manufactured on or after the effective date of this CTSO must meet the MPS requirements in RTCA/

DO-189, “Minimum Performance Standard for Airborne Distance Measuring Equipment (DME) Operating Within the Radio Frequency Range of 960-1215 Megahertz”, dated September 1985.

**a. Environmental Qualification.**

Demonstrate the required performance under the test conditions specified in RTCA/DO-160E, “Environmental Conditions and Test Procedures for Airborne Equipment”, dated December 9, 2004.

**b. Software Qualification**

If the article includes software, develop the software according to RTCA/DO-178B, “Software Considerations in Airborne Systems and Equipment Certification” , dated December 1, 1992.

**c. Deviation.**

For using alternative or equivalent means of compliance to the criteria in the MPS of this CTSO, the applicant must show that the equipment maintains an equivalent level of safety. The applicant must apply for a deviation in accordance with 21.310(b) of CCAR-21R3.

**4. Marking.**

a. Mark at least one major component permanently and legibly with all the information in section 21.312(d) of CCAR-21R3.

b. Also, mark the following permanently and legibly, with at least the manufacturer’s name, subassembly part number, and the CTSO number:

- (1) Each component that is easily removable (without hand tools);
- (2) Each subassembly of the article that the manufacturer determined may be interchangeable.

c. If the article includes software and/or airborne electronic hardware, then the article part numbering scheme must identify the software and airborne electronic hardware configuration. The part numbering scheme can use separate, unique part numbers for software, hardware, and airborne electronic hardware.

d. If applicable, identify any deviations granted to the article by marking “Deviation. See installation/instruction manual (IM)” after the CTSO number, or abbreviate the marking to “(Dev. See IM)”.

## **5. Application Data Requirements.**

The applicant must furnish the responsible certification personnel with the related data to support design and production approval. The application data include a statement of conformance as specified in section 21.310(c)(3) of CCAR-21R3 and one copy each of the following technical data:

- a. A Manual(s) containing the following:
  - (1) Operating instructions and equipment limitations sufficient to describe the equipment’s operational capability.
  - (2) Describe in detail any deviations.
  - (3) Installation procedures and limitations sufficient to ensure that

the DME, when installed according to the installation or operational procedures, still meets this CTSO's requirements. Limitations must identify any unique aspects of the installation. The limitations must include a note with the following statement:

**“This article meets the minimum performance and quality control standards required by a CTSO. Installation of this article on an aircraft requires separate approval.”**

(4) For each unique configuration of software and airborne electronic hardware, reference the following:

(i) Software part number including revision and design assurance level;

(ii) Airborne electronic hardware part number including revision and design assurance level;

(iii) Functional description.

(5) A summary of the test conditions used for environmental qualifications for each component of the article. For example, a form as described in RTCA/DO-160E, “Environmental Conditions and Test Procedures for Airborne Equipment” , Appendix A.

(6) Schematic drawings, wiring diagrams, and any other documentation necessary for installation of the DME.

(7) List of replaceable components, by part number, that makes up the DME. Include vendor part number cross-references, when applicable.

b. Instructions for Continued Airworthiness. Provide instructions for periodic maintenance, calibration, and repair necessary for continued airworthiness of installed equipment. Instructions should include recommended inspection intervals and service life, as appropriate.

c. If the article includes software: a plan for software aspects of certification (PSAC), software configuration index, and software accomplishment summary.

d. If the article includes simple or complex custom airborne electronic hardware: a plan for hardware aspects of certification (PHAC), hardware verification plan, top-level drawing, and hardware accomplishment summary (or similar document, as applicable).

e. Nameplate drawing with the information required by paragraph 4 of this CTSO.

f. The quality control system description required by section 21.143 and 21.310(c)(2) of CCAR-21R3, including functional test specifications. The quality control system should ensure that it will detect any change to the approved design that could adversely affect compliance with the CTSO MPS, and reject the article accordingly.

g. Material and process specifications list.

h. List of all drawings and processes (including revision level) that define the article's design.

i. Manufacturer's CTSO qualification report showing results of

testing accomplished according to paragraph 3 of this CTSO.

## **6. Manufacturer Data Requirements.**

Besides the data given directly to the authorities, have the following technical data available for review by the authorities:

a. Functional qualification specifications for qualifying each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Schematic drawings.

d. Wiring diagrams.

e. Material and process specifications.

f. The results of the environmental qualification tests conducted according to paragraph 3 of this CTSO.

g. If the article includes software, the appropriate documentation defined in RTCA/DO-178B including all data supporting the applicable objectives in RTCA/DO-178B Annex A, Process Objectives and Outputs by Software Level.

h. If the article includes complex custom airborne electronic hardware, the appropriate hardware life cycle data in combination with design assurance level, as defined in RTCA/DO-254, Appendix A, Table A-1.

## **7. Furnished Data Requirements.**

If furnishing one or more articles manufactured under this CTSO to

one entity (such as an operator or repair station), provide one copy of technical data and information specified in paragraphs 5.a and 5.b of this CTSO. Add any data needed for the proper installation, certification, use, or for continued compliance with the CTSO, of DME.

## **8. Availability of Referenced Documents.**

Order RTCA documents from:

Radio Technical Commission for Aeronautics, Inc.

1150 18th Street NW, Suite 910, Washington D.C. 20036

You may also order them online from the RTCA Internet website at:

[www.rtca.org](http://www.rtca.org).