Number：CTSO-C40c
Date of approval：June 28, 2016
Approved by：Yang Zhenmei

China Civil Aviation Technical Standard Order

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.

VOR Receiving Equipment Operating within the Radio Frequency Range of 108-117.95 Megahertz (MHz)

1. Purpose.

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for a VOR receiving equipment operating within the radio frequency range of 108-117.95 MHz CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that VOR receiving equipment operating within the radio frequency range of 108-117.95 MHz 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 airborne VOR receiving equipment identified and

manufactured on or after the effective date of this CTSO must meet the MPS requirement in section 2 of RTCA/DO-196, “Minimum Operational Performance Standards for Airborne VOR Receiving Equipment Operating Within the Radio Frequency Range of 108-117.95 MHz”, dated November 1986, as amended and supplemented by this CTSO.

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, using standard environmental conditions and test procedures appropriate for this article.

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 section 21.310(b) of CCAR-21R3.

4. Marking.

a. Mark at least one major component permanently and legibly with all the information in 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 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 article, 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 airborne VOR receiving equipment.

(7) List of replaceable components, by part number, that makes up the airborne VOR receiving equipment. 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 hard ware: 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-l.

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 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 the airborne VOR receiving equipment.

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.