English Translation Version for Reference Only

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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.

Equipment That Prevents Blocked Channels Used In Two-Way Radio Communications Due To Simultaneous Transmissions

1. Purpose.

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for equipment that prevents blocked channels used in two-way radio communications due to simultaneous transmissions CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards that equipment that prevents blocked channels used in two-way radio communications due to simultaneous transmissions 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 CTSOA will require a new authorization in accordance with section 21.353 of

CCAR-21-R4.

3. Requirements

New models of equipment that prevents blocked channels due to simultaneous transmissions identified and manufactured on or after the effective date of this CTSO must meet the MPS in Section 2 of RTCA, Inc. document RTCA/DO-209, Minimum Operational Performance Standards For Devices That Prevent Blocked Channels Used In Two-Way Radio Communications Due To Simultaneous Transmissions, dated April 23, 1992.

a. Functionality. The standards of this CTSO apply to equipment intended to prevent blocked frequencies used in air traffic control (ATC) two-way radio communication due to simultaneous transmissions by aircraft transmitters. Equipment covered by this CTSO is primarily intended for aeronautical operational control (AOC) and air traffic services (ATS) safety communications. Equipment developed under this CTSO will communicate safety-related tactical and strategic information.

NOTE: We consider equipment functionality beyond the scope of paragraph 3.a of this CTSO or RTCA/DO-209 as significant to the CTSO authorization process, and strongly encourage you to coordinate early with certification authority. Examples of additional functionality include high frequency (HF) or very high frequency (VHF) transceiver equipment

primarily intended for ATS safety communications.

b. Failure Condition Classification. You must develop the system to at least the design assurance level commensurate with a major failure condition classification.

NOTE: Blockage of a communication channel is a hazardous failure condition, whereas loss of ATS communication on an aircraft is a major failure condition. Guidance on design assurance levels may be found in the SAE International's Aerospace Recommended Practice (ARP) 4754, Certification Considerations for Highly Integrated or Complex Aircraft Systems, dated June 27, 1996, for a system. See RTCA/DO-254, Design Assurance Guidance for Airborne Electronic Hardware, dated April 19, 2000, for hardware. See RTCA document DO-178B, Software Considerations in Airborne Systems and Equipment Certification, dated December 1, 1992, for software.

c. Functional Qualification. Demonstrate the required performance under the test conditions specified in RTCA/DO-209, Section 2.4.

d. Environmental Qualification. Defined environmental conditions and corresponding test procedures to produce these environmental conditions are specified in RTCA document DO-160E, Environmental Conditions and Test Procedures for Airborne Equipment, dated December 9, 2004. Demonstrate the required equipment performance during the environmental conditions of RTCA document DO-160E under the test

conditions specified in RTCA/DO-209, Section 2.3.

e. Software Qualification. If the article includes software, develop the software in accordance with RTCA document DO-178B.

f. Deviations. We have provisions for using alternate or equivalent means of compliance to the criteria in this CTSO. If you invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation under section 21.368(a) of CCAR-21-R4.

4. Marking.

a. Mark at least one major component permanently and legibly with all the information in 21.423(b) of CCAR-21-R4, except for the following: the option in 21.423(b)(2), where the name, type and part number must be used instead of the optional model number; and the option in 21.423 (b)(3), where the date of manufacture must be used instead of the optional serial number.

b. Each separate component that is easily removable (without hand tools), each interchangeable element, and each separate subassembly of the article that the manufacturer determines may be interchangeable must be permanently and legibly marked with at least the name of the manufacturer, manufacturer's sub-assembly part number, and the CTSO number.

c. If the component includes a digital computer, the part number must 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 the modification status. Note that similar software versions, approved to different software levels, must be differentiated by part number.

d. When applicable, identify the equipment as an incomplete system or that the appliance accomplishes additional functions beyond that described in paragraphs 3 and 3.a of this CTSO.

e. Identify deviations granted to the article by marking “Deviation. See installation/instruction manual (IM)” after the CTSO number.

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 21.353(a)(1) in CCAR-21R4 and one copy each of the following technical data:

a. Operating instructions and equipment limitations, sufficient to describe the operational capability of the equipment. In particular, describe in detail any operational or installation limitations resulting from specific deviations granted.

b. Installation procedures and limitations. Identify the limitations in the installation manual sufficiently to ensure the article, when installed in accordance with the installation procedures, continues to meet the requirements of this CTSO and will meet the airworthiness and operating requirements appropriate for the intended type of aircraft and operation. The limitations shall include:

(1) A note with the following statement:

The conditions and tests required for CTSO approval of this article are minimum performance standards. Those installing this article, on or within a specific type or class of aircraft, are responsible for determining that the aircraft installation conditions are suitable for the CTSO article. CTSO articles must have separate approval for installation in an aircraft.

(2) When applicable, identify the equipment as an incomplete system or that the equipment accomplishes additional functions beyond that described in paragraphs 3 and 3a of this CTSO. Also describe the functions provided by the equipment.

(3) Identify the development assurance level(s) for the functionality defined in paragraph 3 and 3a of this CTSO. The data must be sufficient for those installing the article to determine compliance with applicable airworthiness requirements.

(4) Any unique aspects of the installation, including those relevant to any deviations granted.

c. Schematic drawings, as applicable to the installation procedures.

d. Wiring diagrams, as applicable to the installation procedures.

e. List of the components, by part number, that make up the system complying with the standards prescribed in this CTSO. Manufacturers should include vendor part number cross references when applicable.

f. Instructions for continued airworthiness, in the form of an installation manual, containing information on the periodic maintenance, calibration and repair of installed equipment, including recommended inspection intervals and service life. Details of deviations granted, as noted in paragraph 5a of this CTSO and relevant to continued airworthiness, must also be described.

g. Equipment specifications.

h. Material and process specifications list.

i. The quality control system description required by CCAR-21-R4 21.358 including functional test specifications used to test each production article to ensure compliance with this CTSO.

j. Manufacturer's CTSO qualification test report.

k.Nameplate drawing providing the information required by paragraph 4 of this CTSO.

l. A list of all drawings and processes, including revision level, necessary to define the article's design. In the case of a minor change, any revisions to the drawing list need only be made available upon request.

m. An environmental qualifications form as described in RTCA document DO-160E for each component of the system.

n.If the article includes a digital computer: plan for software aspects of certification (PSAC), software configuration index (SCI), and software accomplishment summary (SAS). We recommend that the PSAC be submitted early in the software development process. Early submitted will allow timely resolution of issues such as partitioning and determination of software levels.

6. Manufacturer Data Requirements.

In addition to the data furnished directly to the CAAC, each manufacturer must have available for review by the auority manager responsible for the manufacturer's facilities the following technical data:

a. The functional qualification specifications to be used to qualify each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Corrective maintenance procedures within 12 months after CTSO authorization.

d. Schematic drawings.

e. Wiring diagrams.

f. Material and process specifications.

g. The results of the environmental qualification tests conducted in

accordance with RTCA document DO-160E.

h. If the article includes a digital computer, the appropriate documentation as defined in RTCA document DO-178B, including all data supporting the applicable objectives found in Annex A of RTCA document DO-178B, Process Objectives and Outputs by Software Level.

7. Furnished Data Requirements.

One copy of the technical data and information specified in paragraphs 5.a through 5.f of this CTSO must accompany each article or multiple articles manufactured under this CTSO, if furnished to one entity such as an operator or repair station. Add any other data or information necessary for the proper installation, certification and use for continued airworthiness of the equipment.

8. Availlability of Referenced Documents.

a. 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.

b. Order copies of SAE documents from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096. Copies may also be ordered from the SAE Internet website at: www.sae.org.