



Number: CTSO-C104

Date of approval: Jun 4, 2019

Approved by: Xu Chaoqun

## 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.

### Microwave Landing System (MLS) Airborne Receiving Equipment

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

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for MLS Airborne Receiving Equipment CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that MLS Airborne Receiving Equipment 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 21.353 of CCAR-21R4.

#### **3. Requirements**

New models of MLS Airborne Receiving Equipment identified and

manufactured on or after the effective date of this CTSO must meet the MPS qualification and documentation requirements in Radio Technical Commission for Aeronautics (RTCA) Document No. DO-177, “Minimum Operational Performance Standards for Microwave Landing System (MLS) Airborne Receiving Equipment,” Section Two (2), dated July 1981, and Change 1 to DO-177, dated March 16, 1982.

a. Software Qualification. If the equipment design implementation includes a digital computer, an acceptable means of compliance for validation and verification of the computer software package is contained in RTCA/DO-178B, “Software Considerations in Airborne Systems and Equipment Certification,” December 1, 1992.

b. Deviations. For using alternative or equivalent means of compliance to the criteria in this CTSO, the applicant must show that the equipment maintains an equivalent level of safety. Apply for a deviation under the provision of 21.368(a) in CCAR-21R4.

#### **4. Marking.**

a. Mark at least one major component permanently and legibly with all the information in 21.423(b) of CCAR-21R4. The marking must include the serial number.

b. The environmental categories in which it has been qualified to operate in accordance with RTCA document DO-160G.

Note: The use of RTCA/DO-160D (with Changes 1 and 2 only, incorporated) or earlier versions is generally not considered appropriate and will require substantiation via the deviation process as discussed in paragraph 3.b of this CTSO.

c. The CTSO output class marking is as follows:

<u>Class</u>	<u>Output as defined in Table 2-1, DO-177</u>
A	Electrical A
B	Electrical B
C	Visual
D	Basic Electrical
D(V)	Basic Electrical intended for visual indicator user only.

d. Each separate component of equipment (antenna, receiver, controller, etc.) must be permanently and legibly marked with at least the name of the manufacturer, the CTSO number, digital computer software version, CTSO output class, and the environmental categories over which it has been tested.

## **5. 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.
- b. Equipment limitations.
- c. Installation procedures and limitations.
- d. Schematic drawings.
- e. Wiring diagrams.
- f. Specifications.
- g. Equipment calibration and maintenance procedures, which may be submitted within 6 months after production begins or within 6 months after CTSO authorization is granted, whichever occurs first.
- h. List of the components (by part number) that make up the equipment system complying with standards prescribed in this CTSO.
- i. A drawing list, enumerating all the drawings and processes that are necessary to define the article design.
- j. Manufacturer's CTSO qualification test report.
- k. Copy of the functional test specification to be used to test each production article to ensure compliance with this CTSO.
- l. Copy of nameplate drawing.

## **6. 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 or

technical data and information specified in paragraphs 5.a and 5.h of this CTSO. Add any data needed for the proper installation, certification, use, or for continued compliance with the CTSO, of the MLS Airborne Receiving Equipment.

**7. 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).