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MH/T 4001.1-2016

**VHF ground-to-air communication ground system. Part 1:
Technical specification for voice communication system
(English Translation)**

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Foreword

The MH/T 4001 "VHF Ground-to-Air Communication Ground System" plan is divided into the following parts.

- Part 1: Technical specification of voice communication system;
- Part 2: Technical specifications of data communication systems.

This part is part 1 of MH/T 4001.

This part replaces and abolishes MH/T 4001.1-2006 "VHF Ground-to-Air Communication Ground System Part 1: Technical Specifications for Voice Communication Systems", Compared with MH/T 4001.1-2006, the main technical changes are as follows.

- Deleted the overview (Chapter 4 of the 2006 edition);
- The title of Chapter 5 of the 2006 edition was revised to "Classification and Composition", and the classification of fixed stations, mobile stations, and portable stations was added (see 4.1.2);
- Deleted the third category of multi-channel VHF transceiver system (2006 version 6.1.2.1);
- Added the extended function of VHF monitoring system (see 5.3.2);
- Deleted the performance requirements of the selective pager, delayer, and selector (2006 version 6.3.2 ~ 6.3.4);
- Modify the technical indicators of the VHF transceiver system to the technical indicators of

- the VHF transceiver system (see 6.1, 2006 version 7.1.1);
- Modified frequency accuracy (see 6.1.3.1, 2006 edition 7.1.1.2);
- Modify the channel spacing to frequency spacing and delete the 12.5 kHz channel (see 6.1.1.3, 2006 edition 7.1.1.3);
- Delete the system channel isolation (2006 version 7.1.1.8);
- Modify the sending and receiving conversion time of 20 ms to PTT response time of 50 ms and sending and receiving conversion time of 60 ms (see 6.1.3.8, 2006 edition 7.1.1.9);
- Increase the power supply requirements of portable station equipment (see 6.1.1.5)-Modified the receiver sensitivity value (see 6.1.2.1, 2006 version 7.1.2.1);
- Deleted the RF input impedance (2006 version 7.1.2.2)
- Modify the hum and noise level not greater than -45 dBm to the audio noise signal-to-noise ratio not less than 40 dB (see 6.1.2.15, 2006 edition 7.1.2.4);
- Modify the intermediate frequency suppression not less than 90 dB to not less than 80 dB (see 6.1.2.6, 2006 edition 7.1.2.5);
- Modify the automatic gain control to the receiver's RF dynamic range (see 6.1.2.4, 2006 version 7.1.2.6);
- Modified the receiver bandwidth value (see 6.1.2.3, 2006 version 7.1.2.8);
- Modified the audio output value and deleted the technical requirements for speakers and headphones (see 6.1.2.12, 2006 edition 7.1.2.9);
- Modified the requirements of intermodulation suppression (see 6.1.2.8, 2006 edition 7.1.2.10);
- Modify the signal-to-noise ratio or audio output drop to drop or block, and modify the index value (see 6.1.2.7, 2006 version 7.1.2.11);
- Added intermodulation suppression, adjacent channel suppression, spurious response suppression, audio output, audio response, audio AGC range (see 6.1.2.9~6.1.2.13), the squelch lag, carrier frequency offset squelch capability, and squelch response time have been added to the squelch (see 6.1.2.16);
- Added the technical indicators of portable station equipment reception (see 6.1.2);
- Modify the carrier power value and increase the step (see 6.1.3.2, 2006 edition 7.1.3.1);
- Modified the maximum modulation value (see 6.1.3.4, 2006 edition 7.1.3.3);
- Deleted the parasitic frequency offset (2006 version 7.1.3.5);
- Modified audio gain adjustment to audio gain control (see 6.1.3.5, 2006 version 7.1.3.6);

- Modify the audio line impedance to audio response (see 6.1.3.7, 2006 edition 7.1.3.7);
- Deleted the hum and noise level (2006 version 7.1.3.8);
- Modified the PTT response time and increased the sending and receiving conversion time (see 6.1.3.8, 2006 version 7.1.3.9);
- Modify harmonic suppression and clutter suppression to spurious radiation product suppression (see 6.1.3.11, 2006 editions 7.1.3.10, 7.1.3.11);
- Modified the power consumption requirements (see 6.1.3.12, 2006 version 7.1.3.12);
- Increased total distortion (see 6.1.3.6), adjacent channel power suppression (see 6.1.3.9), transmission intermodulation suppression (see 6.1.3.10);
- Increase the transmission technical indicators of portable station equipment (see 6.1.3);
- Deleted the multi-element shared antenna (version 7.2.2 in 2006);
- Modified the antenna frequency range (see 6.2.1, 2006 edition 7.2.1.1);
- Modify the antenna gain to omnidirectional antenna gain (see 6.2.2, 2006 edition 7.2.1.2);
- Modified the antenna standing wave ratio (see 6.2.3, 2006 edition 7.2.1.3);
- Deleted the transmitting oscillator load power (2006 version 7.2.1.6);
- Delete the filter 3 dB bandwidth (version 7.3.2 in 2006);
- Deleted couplers, switches, and splitters (version 7.4 in 2006);
- Added VHF shared system transmitting filter bank and radio frequency wiring (see 6.4);
- Added VHF shared system transmitting filter bank and RF wiring (see 6.5);
- Deleted the circuit bit error rate (version 7.5.2.1 in 2006);
- Modify the circuit delay (2006 version 7.5.2.2) and delay jitter (2006 version 7.5.2.3) to packet or code stream back-to-back delay (See 6.6.2.3) and delay jitter (see 6.6.2.2).
- Deleted the signal selector, delayer, and selective caller (2006 version 7.6.4~7.6.6);
- Modified the criteria for impact and vibration (see 7.1.1, 7.1.2, 2006 edition 8.1.1, 8.1.2);
- Modify the working environment temperature to normal working temperature and extreme working temperature (see 7.1.3, 7.1.4, 2006 edition 8.1.3);
- Increase the test method and corresponding test environment requirements (see Appendix A).

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1 Scope

This part of MH/T 4001 specifies the classification and composition of the ground voice communication system for civil aviation VHF ground-to-air communication, overall performance requirements, Technical indicators, test methods and working environment requirements.

This part is applicable to the design, manufacture and inspection of civil aviation VHF ground-to-air ground voice communication systems and related equipment.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article Pieces. For undated references, the latest version (including all amendments) applies to this document.

GJB 150.16A-2009 Military Equipment Laboratory Environmental Test Method Part 16: Vibration Test GJB 150.18A-2009 Military Equipment Laboratory Environmental Test Method Part 18: Impact Test ICAO "Convention on International Civil Aviation" Annex 10 "Aeronautical Telecommunications"

3.1 Terms and definitions

The terms and definitions defined in Annex 10 "Aeronautical Telecommunications" of ICAO "Convention on International Civil Aviation" apply to this document.

3.2 Abbreviations

The following abbreviations apply to this document.

ADPCM Adaptive Difference Pulse Code Modulation (Adaptive Difference Pulse Code Modulation) BITE built-in test equipment (Built-In Test Equipment) Modulation degree (Modulation) MTBCF Mean Time Between Critical Failures (Mean Time Between Critical Failures) MTBF Mean Time Between Failures (Mean Time Between Failures) PTT button to talk (Push to Talk) RF (Radiation Frequency) SINAD (SIAND=(Signal Noise Distortion)/(Noise Distortion)) SQL Squelch (Squelch) VSWR Voltage Standing Wave Ratio (Voltage Standing Wave Ratio)