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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

MH/T 4038-2013

**L band primary surveillance radar for ATC. Technical
requirement
(English Translation)**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by the Air Traffic Control Industry Management Office of the Civil Aviation Administration of China.

This standard was approved by the Aircraft Airworthiness Certification Department of the Civil Aviation Administration of China.

This standard is under the jurisdiction of the China Academy of Civil Aviation Science and Technology.

Drafting organizations of this standard. Technology Center of Air Traffic Management Bureau of Civil Aviation Administration of China, Nanjing Enruit Industrial Co., Ltd.

1 Scope

This standard specifies the general technical requirements for L-band primary surveillance radar equipment for civil aviation air traffic control.

This standard applies to the configuration and use of L-band primary surveillance radar

equipment for civil aviation air traffic control.

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. For undated references, the latest version (including all amendments) applies to this document.

GB 6364 Electromagnetic environment requirements for aeronautical radio navigation stations
GB 8702 Electromagnetic radiation protection regulations
GB 10436 Hygienic Standard for Microwave Radiation in Workplaces
MH/T 4003 Aviation radio navigation station and air traffic control radar station installation site specifications
MH 4008 Air Traffic Control Radar and Control Center Facilities Coordination and Handover Data Specification
MH/T 4017-2004 Technical specification for S-band primary surveillance radar equipment for air traffic control
MH/T 4020 Technical specification for lightning protection of civil aviation communication, navigation and monitoring facilities

3.1 Terms and definitions

The following terms and definitions established in MH/T 4017-2004 apply to this document.

3.1.1

Swirling 1 targets

The echo pulses during each scan of the radar are related, but independent targets are echoed between the two scans.

3.1.2

Ratio of sidelobe to mainlobe in digital pulse compression when using digital pulse compression technology, the main lobe amplitude is the multiple of the maximum side lobe amplitude.

3.1.3

Angular encoder

A conversion device that converts the angular displacement of the antenna shaft into a digital output.

3.2 Abbreviations

The following abbreviations apply to this document.

BITE Build In Test Equipment
GNSS Global Navigation Satellite System (Global Navigation Satellite System)
LRU field replaceable unit (line replaceable unit)
MTD moving target detect
STC sensitivity-time control
UPS uninterruptible power system (uninterruptible power

system)

4.1 Composition

The L-band primary surveillance radar equipment for air traffic control consists of antennas, turntables (rotary joints, motors, shaft encoders, etc.) and feeder systems.

System, transmitter, receiver, signal processor, monitoring and maintenance seats, etc.

4.2 General requirements

4.2.1

The electromagnetic environment around the L-band primary surveillance radar site should meet the requirements of GB 6364.

4.2.2

The obstacle environment around the L-band primary surveillance radar site should meet the requirements of MH/T 4003.

4.2.3

The microwave leakage radiation of the L-band primary surveillance radar indoor equipment should meet the requirements of GB 8702 and GB 10436.

4.2.4

The main equipment that composes the radar (including the transmitting power amplifier drive, receiving unit, signal processing unit, monitoring unit, etc.) should be redundant the remaining configuration can be automatically and manually switched.

4.2.5

The radar adopts an all-coherent, all-solid, and moving target detection system.

4.2.6

The radar should be able to work continuously for 24 hours.

4.2.7

The radar should achieve automatic target admission under all-weather conditions.

4.3.1 Working frequency band

The radar operating frequency range should be 1 250 MHz to 1 350 MHz.

4.3.2 Airspace

4.3.2.1

The conditions for calculating the range of action are.

4.3.2.2

The maximum operating distance should not be less than 220 n mile, and the minimum operating distance should not be greater than 1 n mile.

4.3.2.3

The elevation angle coverage range is $0^{\circ}\sim 40^{\circ}$.

4.3.2.4

The maximum detection height should not be less than 18 000 m.

4.3.3 Distance parameters

4.3.3.1

The range resolution should not be greater than 750 m.

4.3.3.2

The root mean square value of the distance accuracy should not be greater than 120 m.

4.3.4 Bearing parameters

4.3.4.1

The azimuth resolution should not be greater than 3.3° .

4.3.4.2

The root mean square value of the angle measurement accuracy should not be greater than 0.22° .

4.3.5 Anti-interference ability

The system should have the following anti-interference capabilities.

- Anti-asynchronous interference;
- Anti weather clutter;
- The visibility of the target in the clutter is not less than 48 dB.

4.3.6 Meteorological detection capability

The radar equipment should have independent weather channel and redundant channel output, and be able to display the weather profile in the surveillance airspace according to 6 intensity levels.