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Maritime navigation and radiocommunication equipment and systems – Class B shipborne equipment of the automatic identification system (AIS) – Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CLASS B SHIPBORNE EQUIPMENT OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS) –

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

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This third edition cancels and replaces the second edition published in 2010 and Amendment 1:2013. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition: in the synchronisation method, addition of a direct method for synchronisation from an internal UTC source.

The text of this document is based on the following documents:

FDIS	Report on voting
80/837/FDIS	80/842/RVD

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A list of all parts of the IEC 62287 series published under the general title *Maritime navigation and radiocommunication equipment and systems – Class B shipborne equipment of the automatic identification system (AIS)*, can be found on the IEC website.

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – CLASS B SHIPBORNE EQUIPMENT OF THE AUTOMATIC IDENTIFICATION SYSTEM (AIS) –

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

1 Scope

This part of IEC 62287 specifies the minimum operational and performance requirements, methods of testing and required test results for Class B shipborne automatic identification system (AIS) equipment using carrier-sense time division multiple access (CSTDMA) techniques. This document takes into account other associated IEC International Standards and existing national standards, as applicable.

It is applicable for AIS equipment used on craft that are not covered by the mandatory carriage requirement of AIS under SOLAS Chapter V.

An AIS station intended to operate in receive-only mode is not considered a Class B shipborne mobile AIS station.

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2 Normative references

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61108 (all parts), *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS)*

IEC 61162-1, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

IEC 61993-2, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 2: Class A shipborne equipment of the automatic identification system (AIS) – Operational and performance requirements, methods of test and required test results*

IEC 62320-1, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 1: AIS Base Stations – Minimum operational and performance requirements, methods of testing and required test results*

ITU-R Recommendation M.493, *Digital selective-calling system for use in the maritime mobile service*

ITU-R Recommendation M.825-3:1998, *Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification*

ITU-R Recommendation M.1084-5:2012, I*nterim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service*

ITU-R Recommendation M.1371-5:2014, *Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band*

ITU, *Radio Regulations:2012* (available at http://www.itu.int/publ/R-REG-RR/en)

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.2 Abbreviated terms

AIS automatic identification system
BER bit error rate
BT bandwidth time product
COG course over ground
CP candidate period
CRC cyclic redundancy check
CS carrier-sense
CSTDMA carrier-sense time division multiple access
DGNSS differential global navigation satellite system
DLS data link service
DSC digital selective calling
EPFS electronic position fixing system
EUT equipment under test
FCS frame check sequence
FM frequency modulation
GMSK Gaussian minimum shift keying
GNSS global navigation satellite system
HDLC high level data link control
IMO International Maritime Organization
LME link management entity
MAC medium access control
MMSI maritime mobile service identity
NM nautical mile (1 NM = 1 852 m)
NRZI non return to zero inverted
NTT nominal transmission time
OSI open system interconnection model
P_{ss} steady state RF output power

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PER	packet error rate
PI	presentation interface
PRS	pseudo random sequence
RAIM	receiver autonomous integrity monitoring
RF	radio frequency
RI	reporting interval
Rx	receive
SINAD	signal interference noise and distortion ratio
SOG	speed over ground
SOLAS	International Convention for the Safety Of Life At Sea
TDMA	time division multiple access
TI	transmission interval
Tx	transmit
UTC	universal time co-ordinated
VDL	VHF data link
VHF	very high frequency
VTS	vessel traffic services

4 General requirements

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4.1 General

4.1.1 Capabilities of the Class B "CS" AIS

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The Class B "CS" AIS shall improve the safety of navigation by assisting in the efficient navigation of ships and small craft, protection of the environment, and operation of vessel traffic services (VTS). Small craft are vessels which are not required to comply with the mandatory carriage requirements of SOLAS Chapter V, Regulation 19.

The Class B "CS" AIS shall be capable of providing information from small craft, automatically, continuously and with the required accuracy and update rate:

- in a ship-to-ship mode for collision avoidance,
- as a means for littoral States to obtain information about the craft, and
- as a VTS tool, i.e. ship-to-shore (traffic management).

The Class B "CS" AIS station shall be inter-operable and compatible with Class A or other Class B shipborne mobile AIS stations or any other AIS station operating on the AIS VHF data link. In particular, Class B "CS" AIS stations shall receive other stations, shall be received by other stations and shall not degrade the integrity of the AIS VHF data link.

The Class B "CS" AIS shall only transmit if it has verified that the time period intended for transmission does not interfere with transmissions made by AIS equipment defined in ITU-R M.1371-5:2014, Annex 1, Clause 2 (excluding Class B "CS"). Transmissions of the Class B "CS" AIS shall not exceed one nominal time period (except when responding to a base station with Message 19).

4.1.2 Quality assurance

(see 10.1.1)

Manufacturers shall have a quality control system audited by a competent authority to ensure continuous compliance with the requirements of this document. Alternatively, the