IALA RECOMMENDATION (NORMATIVE)

R0124 (A-124) APPENDIX 0 REFERENCES, GLOSSARY OF TERMS AND ABBREVIATIONS

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1 INTRODUCTION

1.1 INDEX OF APPENDICES TO IALA RECOMMENDATION R0124 (A-124) ON THE AIS SERVICE

General:

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Functional components of AIS Service:

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2 REFERENCES

2.1 IALA REFERENCES

[1] [R-121] IALA Recommendation R–121; "Recommendation on the Performance and Monitoring of DGNSS Services in the Frequency Band 283.5 – 325 kHz"; Edition 1.1, Dec 2004.

[2] [A-123] IALA Recommendation A-123 on "The Provision Of Shore Based Automatic Identification Systems (AIS)" (A-123; Edition 2007).

[3] [A-126] IALA Recommendation A-126 on "The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation" (A-126, Edition 2007).

[4] [1028] IALA AIS Guidelines V1P1 Operational issues.

[5] [1029] IALA AIS Guidelines V1P2 Technical issues.

[6] [1059] IALA Guidelines 1059 on the Comparison of AIS stations.

[7] [e-NAV-101] IALA Recommendation eNAV-101 on "The e-Navigation architecture – the shore perspective".

[8] [e-NAV-201] IALA Recommendation eNAV-201 on "The common shore-based e-Navigation system architecture" (future).

[9] [e-NAV-210] IALA Recommendation eNAV-210 on "The generic e-Navigation service engineering model template" (future).

2.2 IMO REFERENCES

[10] [MSC.74 (69) Annex 3] Recommendation on Performance Standards for an Universal Shipborne Automatic Identification System (AIS).

[11] [MSC.140 (76)] Recommendation on the protection of the AIS VHF Data Link.

2.3 ITU REFERENCES

[12] [M585] Recommendation ITU-R M.585 Assignment and use of maritime mobile service identities.

[13] [M823] Recommendation ITU-R M.823-3 Technical characteristics of differential transmissions for Global Navigation Satellite Systems from maritime radio beacons in the frequency band 283.5-315 kHz in Region 1 and 285-325 kHz in Regions 2 and 3.

[14] [M1371] Recommendation ITU-R M.1371 Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band (and IALA Technical Clarifications).

2.4 IEC REFERENCES

The IEC test standards apply to the Class A and Class B shipborne mobile AIS stations. Due to the co-operative nature of the AIS as a whole, these IEC test standards need to be considered in the document to the extent that functionality of these mobile stations require certain AIS shore station functionality. Also, the test section of the present document was informed by the IEC test standards for Class A and Class B shipborne mobile AIS stations. In addition, the Presentation Interface message definitions contained in IEC 61162-series have been used and adapted to the needs of AIS shore stations.

[15] [62320-1] IEC Standard 62320-1 – AIS Base stations.

[16] [62320-2] IEC Standard 62320-2 - Aids-to-Navigation AIS Stations.

[17] [62320-3] IEC Standard 62320-3 – Simplex repeater station (to be developed).

[18] [62320-4] IEC Standard 62320-4 - Limited Base station (to be developed).

[19] [61993-2] IEC Standard 61993-2 - Class A mobile AIS stations.

[20] [62287-1] IEC Standard 62287-1 - Class B (CSTDMA) mobile AIS stations.

[21] [62287-2] IEC Standard 62287-2 - Class B (SOTDMA) mobile AIS stations (to be developed).

[22] [61097-14] IEC Standard 61097-14 AIS-SART.

[23] [61108-4] IEC Standard 61108-4 - Maritime Navigation and Radio Communication Equipment and Systems - Global Navigation Satellite Systems (GNSS).

[24] [61162-series] Maritime Navigation and Radiocommunication Equipment and Systems.

[61162-1] Part 1: Single talker and single listeners.

[61162-2] Part 2: Single talker and multiple listeners, high-speed transmissions.

[61162-3] Part 3: Multiple talker and multiple listeners, high-speed network bus (future publication).

3 GLOSSARY OF TERMS

The following Table includes a list of terms used within this Recommendation. A brief description of these terms is included.

Table 1 Definitions of terms used in Recommendation R0124 (A-124)

Term	Definition
AIS service	An information service for shore-based applications like VTS, traffic management schemes, ship reporting systems and other shore-based safety-related services. This service consists of information delivery between ships and shore and vice versa.
Basic AIS Service (BAS)	A Basic AIS Service (BAS) is a discrete service of the AIS Service that can be represented as a mnemonic which in turn represents the functional delivery of a defined set of data items. Basic implies that it is one consistent fundamental functionality (or lowest level component) of the AIS Service.
Channel management	The capability to control AIS stations behaviour on the VDL
Data Link Management message (message 20)	Actual FATDMA reservations are being made by transmitting the Data Link Management message (message 20) from an AIS Base station to mobile AIS stations
Equatorial Orbit	Having Plane Angle near 0º
External BAS	The external BAS are those BAS which deliver AIS data to and from the shore based system. Hence, the external BAS also comprise the data flow from ship to shore and from shore to ship (and other traffic objects). External BAS are the functional interface of the AIS Service to other shore-based technical services.
FATDMA block	A FATDMA block consists of consecutive slots

Term	Definition
FATDMA block size	The FATDMA block size is the number of consecutive slots of a block
FATDMA epoch	AIS time period of 6 minutes
FATDMA epoch number	A unique number allocated to each epoch within 1 hour
FATDMA increment	The FATDMA increment is the offset of slots between the first slot of the first FATDMA block and the first slot of the next FATDMA block of the same FATDMA reservation in the same frame
FATDMA offset number	Every FATDMA reservation has a parameter FATDMA offset number. The FATDMA offset number denotes the offset from the slot in which Data Link Management Message (message 20) was received to the first slot of the first FATDMA block to be reserved by the receiving station
FATDMA reservation	A FATDMA reservation is an announcement of a base station to create one or more FATDMA block(s) using the FATDMA reservation parameters
FATDMA reservation Number N	Each Data Link Management message can include up to four (4) FATDMA reservations
FATDMA reservation parameters	Each FATDMA reservation is described by the offset number, block size, reservation timeout, increment
FATDMA reservation time out	This value indicates, how many minutes the FATDMA reservation should be considered valid by the mobile AIS stations
FATDMA start slot	The FATDMA start slot is the slot number of the first slot of the first FATDMA block within a frame
FATDMA Slot Map	Specific plan for FATDMA use in an area
Galileo	European global navigation satellite system
Geostationary or Geostationary Earth Orbit	A geostationary orbit, or Geostationary Earth Orbit (GEO), is a circular orbit 35,786 kilometres (22,236 mi) above the Earth's equator and following the direction of the Earth's rotation. An object in such an orbit has an orbital period equal to the Earth's rotational period, and thus appears motionless, at a fixed position in the sky, to ground observers.
Garbling	Two or more AIS stations transmit on the same time slot
IMO resolution MSC.140(76)	Recommendation for the protection of the AIS VHF Data link
Internal BAS	The Internal BAS are those which are needed to manage the AIS VHF Data Link or gather information on the AIS VDL and/or external AIS (mobile) stations needed for the technical operation of the AIS Service. They are not visible to

Term	Definition
	the remainder of the shore based system, i.e., cannot be accessed by other technical services.
ITU-R M.1371-4	Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band
Keplerian Element	An orbital ellipse around the Earth in a plane angle
Latency	The time required from the moment the data is collected over an area of interest to the time that data is delivered to the user.
Low Earth Orbit	Satellites travelling about 27,400 km/h at a distance between 650km and 800km. A Single revolution takes approximately 90 minutes.
Medium Earth Orbit	Medium Earth orbit (MEO), sometimes called intermediate circular orbit (ICO), is the region of space around the Earth above low Earth orbit (altitude of 2,000 kilometres (1,243 mi)) and below geostationary orbit (altitude of 35,786 kilometres (22,236 mi)).
Plane Angle or Inclination	The angle of tilt between the orbit and the equator. Near 0º tilt is an equatorial orbit, and near 90º is polar orbit.
Polar Orbit	Having a Plane Angle near 90º
Requesting service	A client of the AIS Service that initiates a data exchange
Revisit Time	The time between each pass of a satellite in a constellation over a given area of interest which is a function of orbit and inclination of the satellite.
RF/VHF domain equipment	RF-/VHF domain equipment consists of the means to establish the VDL between the different AIS stations. Antennas, cables and filters are components of the RF-/VHF-equipment.
Ship Density	The population of ships within the satellite footprint. Typically 5000 km for LEO satellites
Spectrum De-collision Processing	Receivers on Satellites capable of detecting and digitizing the RF spectrum for the AIS channels and then processing the raw spectrum files to control the noise floor and reconstruct collided messages with highly specialized software algorithms.
spurious transmissions	One-shot FATDMA transmissions
Tag Block	Metadata appended to an AIS Message as defined in NMEA 0183 vX.XX
Usage Category	Sub-division of Usage Designation
Usage Designation	Specific use for a FATDMA allocation
VDL loading	Number of occupied slots on the AIS VDL

Term	Definition
VDL load management	Measures to minimize the loading of the AIS VDL
VDL Overload	Insufficient slots are available for the transmission of AIS Class A mobile stations
VDL Monitoring	Measuring the use of the AIS VDL
VDL usage stake holders	Potential users of FATDMA Designations
VHF Data Link	VHF data link (VDL) is understood as the medium for exchange of data between different AIS stations; by default, using ITU-assigned channels AIS1 and AIS2 in the VHF maritime mobile service band. The channels AIS1 and AIS2 are divided in time slots; 1 minute consists of 2250 slots per channel, giving in total 4500 slots.

2 ABBREVIATIONS

Table 2 AIS specific abbreviations used in Recommendation R0124 (A-124)

Abbreviation	Definition
A_DYN	Dynamic ship data from Class A shipborne mobile AIS stations
A_STAT	Static ship data from Class A shipborne mobile AIS stations
A_VOY	Voyage related ship data from Class A shipborne mobile AIS stations
ABM	Address Binary Message
ACA	AIS Channel Assignment (message)
ACK	Acknowledgement
AIS	Automatic Identification System
AIS1	Internationally harmonised AIS VHF Marine Band radio channel
AIS2	Internationally harmonised AIS VHF Marine Band radio channel
AIS-LSS	AIS Logical Shore Station
AISM	Association Internationale de Signalisation Maritime
AIS-PCU	AIS PSS Controlling Unit
AIS-PSS	AIS Physical Shore Station
AIS-SM	AIS Service Management
AOI	Area Of Interest
ASC_AD	Addressed Application Specific data Container
ASC_BR	Broadcast Application Specific data Container
ASCII	American Standard Code for Information Interchange
ASGN	Assignment
ASGN_RATE	Reporting rate assignment of AIS mobile station
ASGN_SLOT	Assignment of AIS mobile station into protected area (protected time slots)
ASM	Application Specific Message
AtoN	Aids to Navigation
ATON_DAT	Data from AtoN AIS stations
B_DAT	Ship data from Class B shipborne mobile AIS stations
BAS	Basic AIS Service
BBM	Broadcast Binary Message
BS	Base Station
CDS	Centralized Data Storage
CH_MAN	Channel management
CH_MON	Monitors the AIS VDL and provides relevant data to requesting service

Abbreviation	Definition
CMDS	Common Maritime Data Structure
COG	Course Over Ground
Compass	Chinese global navigation satellite system
CS	Carrier Sense
CSSA	Common Shore Based System Architecture
CSV	Comma Separated Value
DAC	Designated Area Code
DG	Dangerous Goods
DGNSS	Differential Global Navigation Satellite System
DGNSS_COR	DGNSS Corrections as received from AIS Service
DSC	Digital Selective Calling
DTE	Data Terminal Equipment
EAIS	Encrypted AIS
ECB	Electronic Code Box
ECDIS	Electronic Charts Display Information System
EEZ	Exclusive Economic Zone
e-NAV	Electronic Navigation
e-NAVxx	Electronic Navigation XX session
EPFD	Electronic Position-Fixed Device
EPFS	Electronic Position Fixing System
ETA	Estimated Time of Arrival
FATDMA	Fixed Access TDMA
FCI	Function Component Identifier
FI	Function Identifier
FOV	Field Of View
FTP	File Transfer Protocol
GEO	Geostationary Earth Orbit
GLONASS	Global Navigation Satellite System
GMDSS	Global Maritime Distress Safety System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HMI	Human Machine Interface
HS	Harmful Substances
HTML	Hypertext Mark-up Language

Abbreviation	Definition
HTTP	Hyper Text Transfer Protocol
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ID	Identity
IDS	Internal Service-wide Data Storage
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IHDM	IALA Harmonized Data Model
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IP	Internet Protocol
IRIG	Inter Range Instrumentation Group
ISHR	IALA Stakeholders Harmonized User Requirements
ISO	International Standardisation Organisation
IT	Information Technology
ITU	International Telecommunication Union
ITU-R	International Telecommunication Union - Radio-telecommunication Sector
LAN	Local Area Network
LAT	Latitude
LBS	Limited Base Station
LDS	Local Data Storage
LED	Light Emitting Diode
LEO	Low Earth Orbit
LON	Longitude
LSS	Logical Shore Station
M2M	Machine-Machine-Interfaces
MDA	Maritime Domain Awareness
MDEF	Maritime Data Exchange Format
MEO	Medium Earth Orbit
MF	Medium Frequency
Mhz	Megahertz
MKD	Minimum Keyboard Display
MMI	Machine-to-Machine Interfaces
MMSI	Maritime Mobile Service Identifier

Abbreviation	Definition
MOB_PROFILE	Profile of individual mobile AIS station
MP	Marine Pollutant
MRCC	Maritime Rescue Coordination Centre
MSB	Most Significant Bit
MSC	Maritime Safety Committee
MSID	Maritime Sentence Identifier
NM	Nautical Mile
NMEA	National Marine Electronics Association
No.	Number
NRR	Nominal Reporting Rate
OBP	On-Board Processing
OOW	Officer Of the Watch
OSI	Open System Interconnection
PCU	Physical Shore Station Control Unit
PI	Presentation Interface
PSS	Physical Shore Station
RATDMA	Random Access Time Division Multiple Access
RDS	Remote Data Storage
RF	Radio Frequency
ROT	Rate Of Turn
RR	Radio Regulations
RS	Remote Side
RS-232	Recommended Standard 232
RS-422	Recommended Standard 422
RSIM	Reference Station Integrity Monitor
RTCM	Radio Technical Commission for Maritime services
RxA	Receive channel A
RxB	Receive channel B
SAFE_AD	Safety related addressed message
SAFE_BR	Safety related broadcast message
SAIS	Satellite AIS
SAR	Search And Rescue
SAR_DAT	Data from SAR airborne AIS stations

Abbreviation	Definition
SART	Search And Rescue Transponder
SDP	Spectrum De-collision Processing
SDS	System-wide Data Storage
SMTP	Simple Mail Transfer Protocol
SO	Self Organising
SOG	Speed Over Ground
SOTDMA	Self-Organizing Time Division Multiple Access
SQL	Structured Query Language
SSH	Secure Shell
SV	Satellite Vehicle
TCP/IP	Transmission Control Protocol/Internet Protocol
TDMA	Time Division Multiple Access
TDP	Technical Development Personnel
TELNET	Teletype Network
TFR	Transmit Feed-back Report (IEC62320 sentences)
TLS/SSL	Transport Layer Security/Secure Sockets Layer
TOP	Technical Operation Personnel
TQ	Transmission Queue
TTA	Time To Alarm
TxA	Transmit channel A
TxB	Transmit channel B
UDOI	Unique Data Object Identifier
UMDM	Universal Maritime Data Model
UML	Unified Modelling Language
UOPS	Unified Operational Presentation Surface
UPS	Uninterruptable Power Supply
UTC	Universal Time Coordinated
VDL	VHF Data Link
VDM	VHF Data link Message
VDO	VHF Data link message Own
VHF	Very High Frequency
VMS	Vessel Monitoring System
VSI	VDL Signal Information (IEC62320 sentences)
VSR	Voluntary Ship Reporting

Abbreviation	Definition
VTMIS	Vessel Traffic Management Information System
VTS	Vessel Traffic Services
WAN	Wide Area Network