

UNITED REPUBLIC OF TANZANIA  
TANZANIA COMMUNICATIONS REGULATORY AUTHORITY  
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**RADIO FREQUENCY BAND PLAN**  
**FOR**  
**MARITIME COMMUNICATION SERVICES**

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<b>Approved by</b>	<b>Title</b>	<b>Signature</b>	<b>Date</b>
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## **PART 1: Introduction**

The Tanzania Communications Regulatory Authority (TCRA) Act of 2003, and Electronic and Postal Communications Act of 2010, mandate TCRA to manage, assign and promote the efficient use of the radio frequency spectrum resource in the United Republic of Tanzania.

The radio frequency spectrum is part of electromagnetic waves propagated in space and used as a communication medium for all wireless systems. The radio frequency spectrum is universally acknowledged to be a valuable, scarce public resource and thus subject to transparent, predictable and coherent governing policies, legislations and regulations. It is a scarce resource, which requires proper and timely management in order to accommodate the current and future emerging technologies.

The radio frequency band plan for Maritime Communication Services is in line with the frequency allocation under International Telecommunication Union (ITU) region 1.

Maritime services generally operate in internationally recognised frequency bands that are set out in the Radio Regulations. These services may be used on board vessels or be located on land generally near the coast. Marine communication has long history and continues developing to this day. For the last years this field have been changed and innovated greatly. At the first stages of its evolution semaphores and flags were used, later mariners began using radio for transmitting distress signals and also Morse code was in practice. Only in the second half of twentieth century IMO brought in an automated system of ship-to-ship or ship-to-shore communication and the constant presence of marine officer wasn't necessary any more.

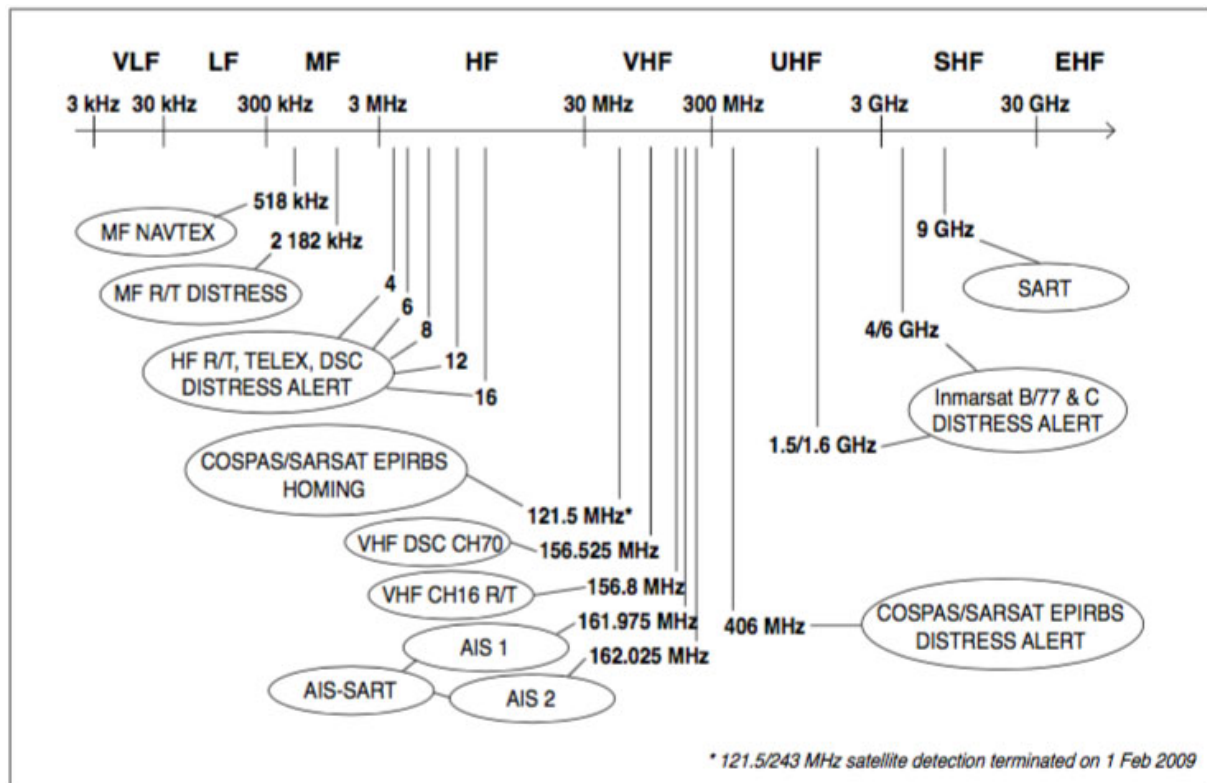
Such communication was held by means of on board systems through the shore stations and satellites. Thus ship-to-ship communication was carried by VHF radio, and then DSC appeared. It could provide digitally remote control commands to receive and transmit distress signals, urgent calls and current messages. Today DSC controllers can be combined with VHF radio.

Satellite communication systems are used to transmit and receive signals in cases when the ship is out of the coverage area of shore stations. The work of such systems depends on geo-stationary satellites. These marine services became available thanks to the commercial company INMARSAT and government agency COSPAS-SARSAT. The INMARSAT provides two-way communication, the system

of Corpas-Sarsat allows to receive emergence signals when there are no facilities of two way marine communications.

Maritime equipment is required to support the safe navigation of vessels and to make distress calls from coast stations/vessels in emergency situations. It enables communication between vessels and coast stations, port/harbour authorities and with other vessels as well.

The maritime radio frequencies and their uses are detailed in the figure below.



## PART 2: Scope and Purpose

This document details the Radio Frequency Band Plan and Channel arrangements for the maritime frequencies. It provides guidance on how the radio frequency spectrum is used by the maritime community for a number of applications as follows:

- Communications between ship and shore at MF, HF, VHF and satellite channels.
- Aids to navigation across the whole spectrum, including beacons, satellite navigation systems and differential global positioning system (DGPS) channels.
- Shore and ship based radars used to inform Vessel Traffic Services (VTS) and ships' masters. These operate at S- and X-band.

- Distress and safety / search and rescue, widely based on specific frequencies associated with the applications listed in the bullets above but also specific frequencies for devices such as Emergency Position Indicating Radio Beacons (EPIRBs).

Use of some of this spectrum is internationally harmonised, in terms of frequency planning, of which a proportion is specifically identified for distress and safety purposes. In particular this includes the communications systems. Radars RADAR are only specified generally in frequency band terms which allows for some flexibility in implementation, although ship borne RADAR for larger vessels have to be type approved to international testing standards.

### **PART 3: Acronyms and Abbreviations**

For the purpose of this document, the following abbreviation applies:-

NAVTEX	Navigational and Meteorological Warning Text Broadcasting System
NBDPWT	Narrowband Direct-Printing Wireless Telegraphy
R/T	Radio Telephony
SSB	Single Sideband
SHF	Super Ultra-high Frequency (3-30 GHz)
Tx	Transmission
UHF	Ultra-high Frequency (300-3000 MHz)
VLF	Very-high Frequency (30-300 MHz)
VHF	Very-low Frequency (3-30 kHz)
W/T	Wireless Telegraphy (Radio Telegraphy)
DSC	Digital Selective Calling
ITU	International Telecommunication Union
GMDSS	Global Maritime Distress and Safety System.
IMO	International Maritime Organisation
DGPS	Differential Global Positioning System
EPIRBs	Emergency Position Indicating Radio Beacons
LRIT	Long-Range Identification and Tracking
VTS	Vessel Traffic Services
AIS	Automatic identification system
VDES	VHF Data Exchange System
NAVDAT	Navigational Data
RLS	Return- Link Services
MEOSAR	Medium Earth Orbiting Search and Rescue

## PART 4: Recommendations related to maritime radiocommunications services

SUBJECT	TITLE	RECOMMENDATIONS
<b>Abbreviations</b>	Miscellaneous abbreviations and signals to be used for radio communications in the maritime mobile service.	<a href="#">Rec. ITU-R M.1172</a>
<b>AIS</b>	Technical characteristics for an automatic identification system using time-division multiple accesses in the VHF maritime mobile band.	<a href="#">Rec. ITU-R M.1371</a>
<b>Alarm signals</b>	Automatic receiving equipment for radiotelegraph and radiotelephone alarm signals.	<a href="#">Rec. ITU-R M.1175</a>
<b>COSPAS SARSAT/EPIRBs</b>	Protection criteria for Cospas-Sarsat search and rescue instruments in the band 406-406.1 MHz.	<a href="#">Rec. ITU-R M.1478</a>
	Protection criteria for cospas-sarsat local user terminals in the band 1 544-1 545 MHz.	<a href="#">Rec. ITU-R M.1731</a>
	Technical characteristics of vhf emergency position-indicating radio beacons using digital selective calling.	<a href="#">Rec. ITU-R M.693</a>
	Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EIRP) system operating through a satellite system in the 406 MHz band.	<a href="#">Rec. ITU-R M.633</a>
	Technical characteristics of emergency position-indicating radio beacons operating on the carrier frequencies of 121.5 MHz and 243 MHz.	<a href="#">Rec. ITU-R M.690</a>
	Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite epirb) system operating through geostationary satellites in the 1.6 GHz band.	<a href="#">Rec. ITU-R M.632</a>
<b>DATA transmission and reception</b>	Automatic HF facsimile and data system for maritime mobile users.	<a href="#">Rec. ITU-R M.1081</a>
	Characteristics of HF radio equipment	<a href="#">Rec. ITU-R M.1798</a>

	for the exchange of digital data and electronic mail in the maritime mobile service.	
	Characteristics of a digital system, named navigational data for broadcasting maritime safety and security related information from shore-to- ship in the maritime HF frequency band.	<a href="#">Rec. ITU-R M. 2058</a>
	Evaluation of the quality of digital channels in the maritime mobile service.	<a href="#">Rec. ITU-R M.626</a>
<b>DSC</b>	Digital Selective-Calling system for use in the maritime mobile service.	<a href="#">Rec. ITU-R M.493</a>
	Operational procedures for the use of digital selective-calling equipment in the Maritime Mobile Service.	<a href="#">Rec. ITU-R M.541</a>
	Digital Selective Calling system enhancement for multiple equipment installations.	<a href="#">Rec. ITU-R M.1080</a>
	Calling-channel loading for Digital Selective-Calling (DSC) for the Maritime Mobile Service.	<a href="#">Rec. ITU-R M.822</a>
	Characteristics of a Transponder system using Digital Selective Calling techniques for use with Vessel Traffic Services and ship-to-ship identification.	<a href="#">Rec. ITU-R M.825</a>
	Optional expansion of the Digital Selective-Calling system for use in the Maritime Mobile Service.	<a href="#">Rec. ITU-R M.821</a>
	International Maritime MF/HF radiotelephone system with automatic facilities based on Digital Selective Calling signalling format.	<a href="#">Rec. ITU-R M.1082</a>
<b>MMSI</b>	Assignment and use of identities in the Maritime Mobile Service.	<a href="#">Rec. ITU-R M.585</a>
<b>Morse Code &amp; 500 kHz</b>	Morse telegraphy procedures in the Maritime Mobile Service.	<a href="#">Rec. ITU-R M.1170</a>
	Characteristics of a digital system, named navigational data for	<a href="#">Rec. ITU-R M.2010</a>

	broadcasting maritime safety and security related information from shore-to-ship in the 500 KHz band.	
	International morse code	<a href="#">Rec. ITU-R M.1677</a>
<b>NAVTEX</b>	Prediction of sea area A2 and Navtex ranges and protection of the A2 Global Maritime Distress and Safety System distress watch channel.	<a href="#">Rec. ITU-R M.1467</a>
<b>NBDP</b>	Operational and technical characteristics for an automated direct-printing telegraph system for promulgation of navigational and meteorological warnings and urgent information to ships.	<a href="#">Rec. ITU-R M.540</a>
	Direct-printing telegraph equipment employing automatic identification in the maritime mobile service.	<a href="#">Rec. ITU-R M.625</a>
	Operational procedures for the use of direct-printing telegraph equipment in the maritime mobile service.	<a href="#">Rec. ITU-R M.492</a>
	Use of 9-digit identities for narrow-band direct-printing telegraphy in the maritime mobile service.	<a href="#">Rec. ITU-R M.820</a>
	Technical characteristics for hf maritime radio equipment using narrow-band phase-shiftkeying (nbpsk) telegraphy.	<a href="#">Rec. ITU-R M.627</a>
	Technical characteristics for a high frequency direct-printing telegraph system for promulgation of high seas and Navtex-type maritime safety information.	<a href="#">Rec. ITU-R M.688</a>
<b>Radar Transponders</b>	Technical characteristics for search and rescue radar transponders.	<a href="#">Rec. ITU-R M.628</a>
<b>Radiotelephony</b>	Technical characteristics of single-sideband transmitters used in the maritime mobile service for radiotelephony in the bands between 1 606.5 KHz (1 605 KHz region 2) and 4 000 KHz and between 4 000 KHz and	<a href="#">Rec. ITU-R M.1173</a>



	27 500 KHz.	
	Radiotelephony procedures in the maritime mobile service.	<a href="#">Rec. ITU-R M.1171</a>
<b>VHF/ UHF</b>	Automated VHF/UHF maritime mobile telephone system.	<a href="#">Rec. ITU-R M.586</a>
	A Long- Term Solution for improved efficiency in the use of the band 156 - 174 MHz by stations in the Maritime Mobile Services.	<a href="#">Rec. ITU-R M.1312</a>
	Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service.	<a href="#">Rec. ITU-R M.1084</a>
	Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 KHz	<a href="#">Rec. ITU-R M.489</a>
	Characteristics of VHF radio systems and equipment for the exchange of data and electronic mail in the maritime mobile service RR Appendix 18 channels.	<a href="#">Rec. ITU-R M.1842</a>
	Coast station identities and initiation of location registration in an automated VHF/UHF maritime mobile telephone system.	<a href="#">Rec. ITU-R M.587</a>
	Technical characteristics of equipment used for on-board vessel communications in the bands between 450 and 470 MHz.	<a href="#">Rec. ITU-R M.1174</a>
	Technical characteristics for a VHF data exchange system in the maritime mobile band	<a href="#">Rec. ITU-R M.2092</a>
	International maritime VHF radiotelephone system with automatic facilities based on DSC signaling format.	<a href="#">Rec. ITU-R M.689</a>
	Technical Characteristics of Autonomous Maritime Radio devices operating in the frequency bands 156-	<a href="#">Rec. ITU-R M.2135</a>

	162.05 MHz	
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## **PART 5: Maritime Safety and Security Communications**

### **5.1 The Global Maritime Distress and Safety System (GMDSS)**

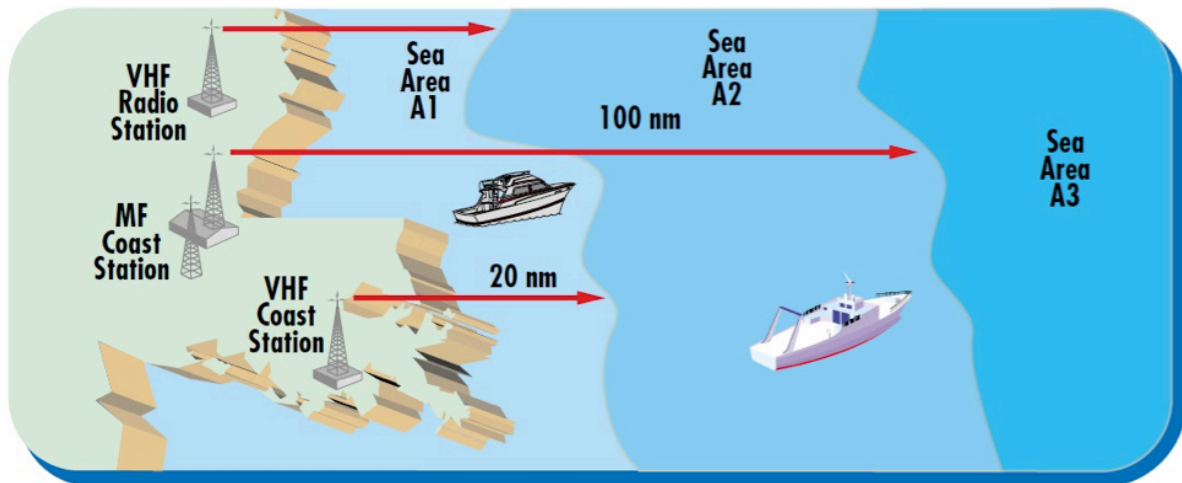
Is an internationally agreed set of safety procedures, frequencies, types of equipment, and communication protocols, developed through cooperation between International Maritime Organisation (IMO) and International Telecommunication Union (ITU) since the mid 1970s. It operates using terrestrial and satellite radio technologies on board ships and onshore, making it easier to rescue persons and ships in distress. The system alerts coast radio stations or Rescue Coordination Centers (RCC) in cases of distress at sea.

The Global maritime distress and safety system (GMDSS) concept includes:

- Terrestrial communications in VHF, MF and HF maritime frequency bands, including digital selective calling (DSC) capability, radiotelephony (RT) and MF/HF narrow-band direct printing (NBDP);
- Satellite communication systems using geostationary and non- geostationary satellites;
- Satellite service for search and rescue on 406 MHz (Cospas-Sarsat 406 MHz emergency position-indicating radio beacons (EPIRBs));
- Maritime safety information (MSI) via NAVTEX system (518 kHz international, 490 kHz and 4 209.5 kHz national), MF/HF NBDP, satcom enhance group call service (EGC);
- Locating (radar search and rescue transponder (9 200-9 500 MHz SART), VHF automatic identification system transmitter (AIS-SART)).

### **5.2 GMDSS Four Sea Areas**

Under international requirements the GMDSS defines four sea areas: A1, A2, A3 and A4. Such division allows tracking areas where GMDSS services are available and defining what radio equipment ships must carry (as type of radio safety equipment depends upon the GMDSS areas in which ships travel).



- A1** – 20-30 nautical miles from coast station – at least one VHF coast station covers this area. The continuous digital selective calling (Ch.70/156.525 MHz) alerting and radiotelephony services are available.
- A2** – the area within a coverage of at least one coast MF radio station providing continuous monitoring at a frequency of 2187.5 kHz (DSC) and radio communications in telephony mode at a frequency of 2182 kHz (100-150 nautical miles), except for the area A1.
- A3** – the area within the zone of coverage of geostationary satellites INMARSAT (approximately 70°N and 70°S) with the exception of areas A1 and A2.
- A4** – this area is beyond all other ones. It includes the Polar Regions, North and South of about 76 degrees of latitude.

### 5.3 Maritime Equipment Requirements at Sea Areas

GMDSS equipment requirements in force for all passenger ships in international trade as well as cargo ships of 300 gt and upwards in international trade according to SOLAS 1974 and its amendments.

Equipment	A1	A2	A3 IMMARSAT Solution	A3 HF Solution	A4
<b>VHF with DSC</b>	x	x	x	x	x
<b>DSC watchreceiver</b>	x	x	x	x	x

channel 70					
MF telephony with MFDSC		x	x		
DSC watch receiver MF 2187.5 kHz		x	x		
Inmarsat ship earth station with EGC receiver			x		
MF/HF telephony with DSC and NBDP				x	x
DSC watch receiver MF/HF				x	x
Duplicated VHF with DSC			x	x	x
Duplicated Inmarsat SES		x	x		
Duplicated MF/HF telephony with DSC and NBDP					x
NAVTEX receiver 518 kHz	x	x	x	x	x
EGC receiver	x <sup>1</sup>	x <sup>1</sup>		x	x
Float-free satellite EPIRB	x	x	x	x	x <sup>4</sup>
Radar transponder (SART)	x	x	x	x	
Hand-held GMDSS VHF transceivers	x <sup>2</sup>	x <sup>2</sup>	x <sup>2</sup>	x <sup>2</sup>	x <sup>2</sup>
"Distress panel" (SOLAS regulations IV/6.4 and 6.6) Automatic updating of position to all relevant radiocommunication	x <sup>3</sup>	x <sup>3</sup>	x <sup>3</sup>	x <sup>3</sup>	x <sup>3</sup>
<b>For passenger ships the following applies from 01.07.97</b>					
"Distress panel" (SOLAS regulations IV/6.4 and	x	x	x	x	x

<b>6.6)</b>					
<b>Automatic updating of position to all relevant radiocommunication equipment (regulation IV/6.5). This also applies for cargo ships from 01.07.02 (chapter IV, new regulation 18)</b>	X	X	X	X	X
<b>Two-way on-scene radio communication on 121.5 and 123.1 MHz from the navigating bridge (SOLAS regulation IV/7.5)</b>	X	X	X	X	X

<sup>1</sup> Outside NAVTEX coverage area.

<sup>2</sup> Cargo ships between 300 and 500 gt: 1 set. Cargo ships of 500 gt and upwards and passenger Ship:2 sets.

<sup>3</sup> Cargo ships between 300 and 500 gt: 2 sets. Cargo ships of 500 gt and upwards and passenger ships:3 sets.

<sup>4</sup>Inmarsat-E EPIRB cannot be utilized in sea area A4.

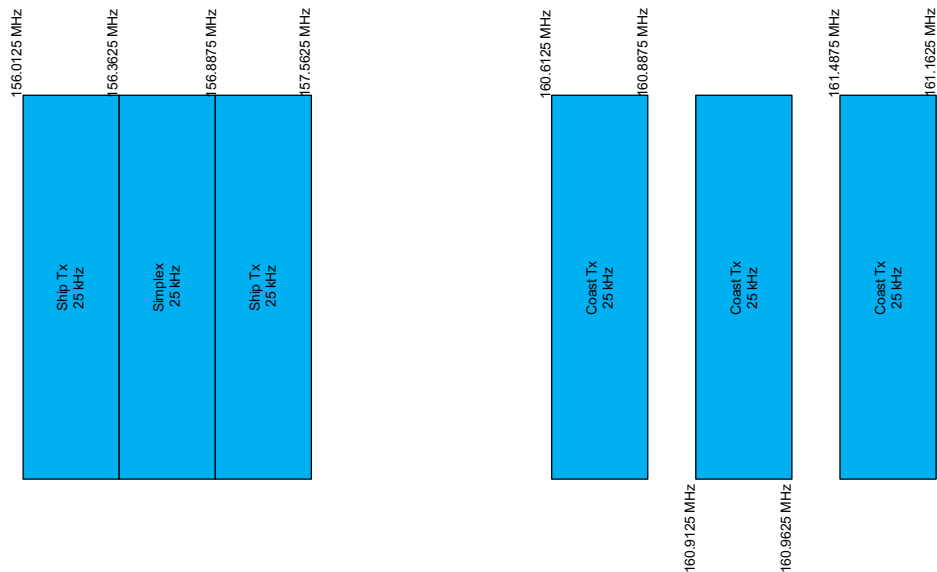
#### 5.4 Frequencies for the Global Maritime Distress and Safety System (GMDSS)

According to [Appendix 15 of the ITU Radio Regulations \(Edition of 2020\)](#), the following frequencies under the Table below shall be used for the transmission of distress and safety information under the GMDSS:

<b>Radiotelephony</b>	<b>DSC</b>	<b>Radio telex (NBDP)</b>
<b>VHF band</b>		
CH16 (156.8 MHz)	CH70 (156.525 MHz)	
<b>MF band</b>		
2 182 kHz	2 187.5 kHz	2 174.5 kHz
<b>HF band</b>		
4 125 kHz	4 207.5 kHz	4 177.5 kHz

6 215 kHz	6 312 kHz	6 268 kHz
8 291 kHz	8 414.5 kHz	8 376.5 kHz
12 290 kHz	12 577 kHz	12 520 kHz
16 420 kHz	16 804.5 kHz	16 695 kHz

## 5.5 Maritime VHF Band Plan (156-162MHz)



## 5.6 Maritime VHF Radio Channel Arrangement Plan

Channel designator	Ship Transmitting (Tx) Channel	Base Transmitting (Tx) Channel	Use
60	156.025	160.625	Port operations and ship movement
01	156.050	160.650	Port operations and ship movement
61	156.075	160.675	Port operations and ship movement
02	156.100	160.700	Port operations and ship movement
62	156.125	160.725	Port operations and ship movement

<b>Channel designator</b>	<b>Ship Transmitting (Tx) Channel</b>	<b>Base Transmitting (Tx) Channel</b>	<b>Use</b>
03	156.150	160.750	Port operations and ship movement
63	156.175	160.775	Port operations and ship movement
04	156.200	160.800	Port operations and ship movement
64	156.225	160.825	Port operations and ship movement
05	156.250	160.850	Port operations and ship movement
65	156.275	160.875	Port operations and ship movement
06	156.300		Inter-Ship
2006	160.900	160.900	Reserve for Future Use
66	156.325	160.925	Port operations and ship movement
07	156.350	160.950	Port operations and ship movement
67	156.375	156.375	Inter-Ship Port operations and ship movement
08	156.400		Inter-Ship
68	156.425	156.425	Port operations and ship movement
09	156.450	156.450	Inter-Ship Port operations and ship movement
69	156.475	156.475	Inter-Ship Port operations and ship movement
10	156.500	156.500	Inter-Ship Port operations and ship movement
70	156.525	156.525	Digital selective calling for distress, safety and calling
11	156.550	156.550	Port operations and ship movement

<b>Channel designator</b>	<b>Ship Transmitting (Tx) Channel</b>	<b>Base Transmitting (Tx) Channel</b>	<b>Use</b>
71	156.575	156.575	Port operations and ship movement
12	156.600	156.600	Port operations and ship movement
72	156.625		Inter-Ship
13	156.650	156.650	Inter-Ship
73	156.675	156.675	Inter-Ship
14	156.700	156.700	Port operations and ship movement
74	156.725	156.725	Port operations and ship movement
15	156.750	156.750	Inter-ship Port operations and ship movement
75	156.775	156.775	Port operations and ship movement
16	156.800	156.800	DISTRESS, SAFETY AND CALLING
76	156.825	156.825	Port operations and ship movement
17	156.850	156.850	Inter-ship Port operations and ship movement
77	156.875		Inter-ship
18	156.900	161.500	Port operations and ship movement
78	156.925	161.525	Port operations and ship movement
1078	156.925	156.925	Port operations and ship movement
2078		161.525	Port operations and ship movement
19	156.950	161.550	Port operations and ship movement
1019	156.950	156.950	Port operations and ship movement
2019		161.550	Port operations and ship movement



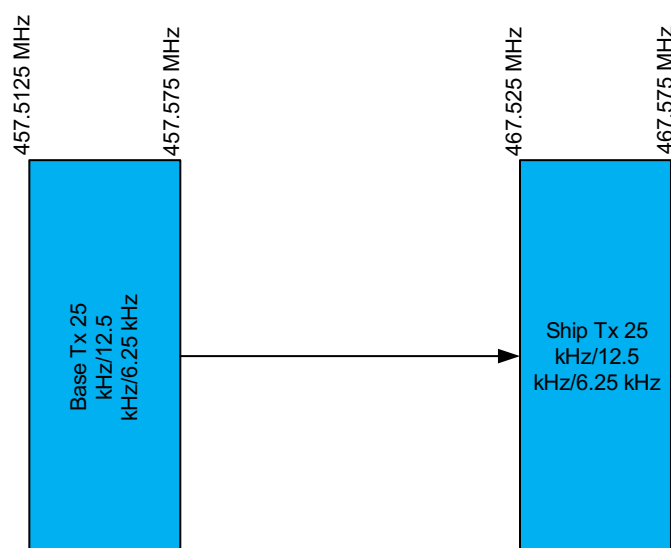
<b>Channel designator</b>	<b>Ship Transmitting (Tx) Channel</b>	<b>Base Transmitting (Tx) Channel</b>	<b>Use</b>
79	156.975	161.575	Port operations and ship movement
1079	156.975	156.975	Port operations and ship movement
2079		161.575	Port operations and ship movement
20	157.000	161.600	Port operations and ship movement
1020	157.000	157.000	Port operations and ship movement
2020		161.600	Port operations and ship movement
80	157.025	161.625	Port operations and ship movement
21	157.050	161.650	Port operations and ship movement
81	157.075	161.675	Port operations and ship movement
22	157.100	161.700	Port operations and ship movement
82	157.125	161.725	Port operations and ship movement
23	157.150	161.750	Port operations and ship movement
83	157.175	161.775	Port operations and ship movement
24	157.200	161.800	Port operations and ship movement
1024	157.200	157.200	Inter-ship (digital only) Port operations and ship movement
2024	161.800	161.800	Inter-ship (digital only) Port operations and ship movement
84	157.225	161.825	Port operations and ship movement

<b>Channel designator</b>	<b>Ship Transmitting (Tx) Channel</b>	<b>Base Transmitting (Tx) Channel</b>	<b>Use</b>
1084	157.225	157.225	Inter-ship (digital only) Port operations and ship movement
2084	161.825	161.825	Inter-ship (digital only) Port operations and ship movement
25	157.250	161.850	Port operations and ship movement
1025	157.250	157.250	Inter-ship (digital only) Port operations and ship movement
2025	161.850	161.850	Inter-ship (digital only) Port operations and ship movement
85	157.275	161.875	Port operations and ship movement
1085	157.275	157.275	Inter-ship (digital only) Port operations and ship movement
2085	161.875	161.875	Inter-ship (digital only) Port operations and ship movement
26	157.300	161.900	Port operations and ship movement
1026	157.300		Reserved for future use
2026		161.900	Reserved for future use
86	157.325	161.925	Port operations and ship movement
1086	157.325		Reserved for future use
2086		161.925	Reserved for future use
1027	157.350	157.350	Port operations and ship movement
ASM 1	161.950	161.950	Reserved for future use
87	157.375	157.375	Port operations and ship movement
1028	157.400	157.400	Port operations and ship movement
ASM 2	162.000	162.000	Reserved for future use

Channel designator	Ship Transmitting (Tx) Channel	Base Transmitting (Tx) Channel	Use
88	157.425	157.425	Port operations and ship movement
AIS 1	161.975	161.975	Reserved for future use
AIS 2	162.025	162.025	Reserved for future use

Note: The VHF channel plan is further described in [Appendix 18 of the ITU Radio Regulations \(Edition 2020\)](#). A total of 68 VHF channels are available in the VHF channel plan. Of these at least 65 are expected to be selectable by the user, but additional channels could be available depending on the manufacturer programming, since a number of channels can be operated in single-frequency or two-frequency mode under various Appendix 18 Notes. A new channel 2006 has been designated for experimental use for future applications or systems (e.g. new AIS applications, man overboard systems, etc.) if authorised by administrations. At present, no equipment can monitor this channel, but new equipment may. The eventual usage of this channel in reality is yet to be determined.

### 5.7 Maritime UHF On Board (457/467 MHz) Band Plan



#### Maritime UHF On Board (457/467 MHz) Channel Arrangements (Lower Channel)

Lower Channels					
25 KHz Channel		12.5 KHz Channel		6.25 KHz Channel	
1	457.52500			102	457.515625

		11	457.52500	111	457.521875
				112	457.528125
2	457.55000	12	457.53750	121	457.534375
				122	457.540625
		13	457.55000	131	457.546875
3	457.57500			132	457.553125
		14	457.56250	141	457.559375
				142	457.565625
		15	457.57500	151	457.571875
				152	457.578125
				161	457.584375

## 5.8 Maritime HF Radiotelephone Channel Plan

The HF radiotelephone channel plan is described in [Appendix 17 of the ITU Radio Regulations \(Edition 2020\)](#). The plan allocates a series of channels for duplex operation, and a series of channels for simplex (inter-ship) operation. Duplex channels are always referred to by their channel number. This channel number is comprised of 3 or 4 digits, the first one or two representing the frequency band (4, 6, 8, 12, 16, 22 and 26 MHz), and the last two representing the actual channel number, i.e. channel 403 is the third channel in the 4 MHz band, and channel 1602 is the second channel in the 16 MHz band. Appendix 17 lists both the simplex and duplex channels available in the 4 to 26 MHz range. As a result of the introduction of GMDSS, and the move to satellite-based communications methods, these sub-bands have become under-utilized, and with full international agreement, new digital technologies are expected to be introduced into these bands.

## PART 6: Systems other than GMDSS

### 6.1 Automatic identification system (AIS)

Enhances the safety of navigation by providing identification, tracking and other information about the ship to other ships and to coastal destinations automatically. It is regarded as a complementary mean to marine radars to exchange navigational data in VHF frequency band for collision avoidance. Various AIS technology applications continue to be developed very actively, e.g. AIS-Search and Rescue Transmitters (AIS-SARTs), satellite distress beacons EPIRB-AIS (emergency position-indicating radio beacon with an Automatic Identification System transmitter), AIS Aids to Navigation (AIS-AtoN), “man overboard” (MOB-AIS), Autonomous Maritime Radio Devices (AMRD-AIS).

## **6.2 Long-Range Identification and Tracking (LRIT)**

System provides information for the global identification and tracking of ships up to 1000 nautical miles from coast. Ships report to LRIT Data Centre every six hours as a minimum. Satcom technologies are mainly used to support LRIT.

## **6.3 Ship Security Alert System (SSAS)**

Is one of the measures to strengthen ship's security against acts of terrorism and piracy. It provides covert alert «ship-to-shore» which indicates to competent authorities ashore that security of the ship was jeopardized. Satcom technologies are mainly used to support SSAS.

## **PART 7: New developments in supporting of e-navigation concept**

### **7.1 E-navigation**

Navigation is defined by IMO as “the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment.”

It is expected to provide digital information and infrastructure and based on the interconnection of ships and shore facilities by communication links, including high speed broad band data, to update information on computerized bridge displays in real time.

### **7.2 VHF data Exchange System (VDES)**

VDES integrates the functions of VHF data exchange (VDE), application specific messages (ASM) and AIS in the VHF maritime band (156.025-162.025 MHz). VDES comprises both terrestrial and satellite components.

### **7.3 NAVDAT (Navigational Data)**

NEVDAT is a digital system operating in MF/HF maritime bands for broadcasting of maritime safety and security information. NAVDAT system may complement or possibly replace in future, current NAVTEX (Navigational Telex) system.

#### 7.4 Satellite service for search and rescue on 406 MHz (COSPAS-SARSAT)

Medium Earth Orbiting Search and Rescue (MEOSAR) is space segment with search and rescue (SAR) repeaters placed on the satellites of the Global Navigation Satellite Systems (GNSS). MEOSAR complements the existing low-altitude Earth orbit (LEOSAR) and geostationary Earth orbit (GEOSAR) systems and will eventually replace the LEOSAR system.

MEOSAR offer:

- advantages by providing transmission of the distress message and independent location of the beacon with near-real-time global coverage;
- new capability to provide “Return-Link-Service” (RLS) transmission to a distress beacon that will provide the user with a confirmation that the distress message has been received.

### PART 8: Spectrum usage and regulatory requirements

The Maritime radio equipment shall operate in accordance with the provisions of the Radio Regulations and relevant ITU-R Recommendations. The following table lists the designated frequency bands for Maritime radio application and their usage conditions:

Frequency Range	Usage	Regulatory Requirements
283.5 – 315.5 kHz	Maritime radionavigation <b>(Maritime Radio Beacons)</b>	The radiated power shall be the minimum <sup>[SEP]</sup> value necessary to give the desired field strength at the service range, not exceeding 50 µV/m (ITU-R M.823)
415 – 526.5 kHz	MF Maritime Mobile ( <b>main use</b> ) Digital Selective Calling <b>(DSC)</b> Narrow Band Direct Printing <b>(NBPD)</b> Maritime Safety Information	Use shall be in accordance with ITU GE-85 Plan GE85-R1-MAR

Frequency Range	Usage	Regulatory Requirements
	<b>(NAVTEX)</b>	
1606.5 – 27500 kHz	MF/HF Maritime Mobile <b>(main use)</b> Narrow Band Direct Printing <b>(NBPD)</b> Maritime Safety Information <b>(NAVTEX)</b> Digital Selective Calling <b>(DSC)</b>	Use shall be in accordance with ITU GE-85 Plan GE85-R1-MAR Channel plans based on RR Appendices 17 and 25
156 – 162.5 MHz	Maritime Mobile (shore to ship) VHF Radio	RR Appendix 18 with 25 kHz channel spacings
406 – 406.1 MHz	Emergency Position-Indicating Radio Beacons <b>(406-EPIRBs)</b> Personal Locator Beacon <b>(PLB)</b>	RR Appendix 15
1540 – 1545 MHz 1626.5 – 1646.5 MHz	Maritime Mobile-satellite Terminals <b>(GMDSS)</b>	RR Appendix 15
2900 – 3100 MHz	Maritime radionavigation Radar Beacon <b>(RACON)</b>	ITU-R M.824
9200 – 9500 MHz	Maritime radionavigation Radar Beacon <b>(RACON)</b> Radar transponders for search and rescue <b>(SART)</b>	ITU-R M.824 ITU-R M.628

## PART 9: Document Administration

### 9.1 Amendment

TCRA may from time-to-time, review, and update or modify this document to ensure its continued service and to meet the international and/or national performance requirements as necessary.

### 9.2 Compliance

Appropriate provisions of the TCRA Act, 2003, the Electronic and Postal Communications Act, 2010 and the Electronic and Postal Communications

(Radiocommunication and Frequency Spectrum) Regulations, 2018, shall be used for compliance of this document and effective from the date it has been published.

### **9.3 Publication**

This document shall be published on the TCRA website <https://www.tcra.go.tz> for public information, compliance and reference purposes.