

Raymarine®



VHF DSC Radios

Troubleshooting guide

English (en-US)

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Software updates



Check the Raymarine website for the latest software releases for your product.
www.raymarine.com/software

Product documentation



The latest versions of all English and translated documents are available to download in PDF format from the website: www.raymarine.com/manuals.
Please check the website to ensure you have the latest documentation.

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Chapter 1: Important information

Certified Installation

Raymarine recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.



Warning: Product installation and operation

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- Raymarine recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.



Warning: Switch off power supply

Ensure the vessel's power supply is switched OFF before starting to install this product. Do NOT connect or disconnect equipment with the power switched on, unless instructed in this document.

FCC



Warning: FCC Warning (Part 15.21)

Changes or modifications to this equipment not expressly approved in writing by Raymarine Incorporated could violate compliance with FCC rules and void the user's authority to operate the equipment.

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio / TV technician for help.

Innovation, Science and Economic Development Canada (ISED)

This device complies with License-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian ICES-003.

Innovation, Sciences et Développement économique Canada (Français)

Cet appareil est conforme aux normes d'exemption de licence RSS.

Son fonctionnement est soumis aux deux conditions suivantes:

1. cet appareil ne doit pas causer d'interférence, et
2. cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.



Warning: Maximum Permissible Exposure

For optimal radio performance and minimal human exposure to Radio Frequency (RF) electromagnetic energy, you must ensure that the antenna is:

- connected to the radio before transmitting
- located where it will be away from people
- located at least 1.8 meters (5.9 feet) from the radio's main unit

Failure to observe these guidelines may expose those within the Maximum Permissible Exposure (MPE) radius to RF radiation absorption that exceeds the FCC MPE limit. It is the radio operator's responsibility to ensure that no person comes within this radius.

Caution: Perform regular radio checks

Perform regular radio checks when using your vessel, as recommended in radio training and certification schemes and radio equipment rules of use.

Caution: Ensure proper radio use

Under no circumstances should a DSC distress alert be sent from your radio for test purposes. Such action is a violation of rules of use for radio equipment, and can result in heavy fines.

Water ingress

Water ingress disclaimer

Although the waterproof rating capacity of this product meets the stated water ingress protection standard (refer to the product's *Technical Specification*), water intrusion and subsequent equipment failure may occur if the product is subjected to high-pressure washing. Raymarine will not warrant products subjected to high-pressure washing.

Disclaimer

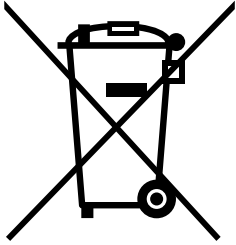
Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

Raymarine is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment which contains materials, components and substances that may be hazardous and present a risk to human health and the environment when WEEE is not handled correctly.



Equipment marked with the crossed-out wheeled bin symbol indicates that the equipment should not be disposed of in unsorted household waste.

Local authorities in many regions have established collection schemes under which residents can dispose of waste electrical and electronic equipment at a recycling center or other collection point.

For more information about suitable collection points for waste electrical and electronic equipment in your region, refer to the Raymarine website:

www.raymarine.eu/recycling.



Warranty registration

To register your Raymarine product ownership, please visit www.raymarine.com and register online.

It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and this document. Please check the Raymarine website (www.raymarine.com) to ensure you have the most up-to-date version(s) of the documentation for your product.

Chapter 2: Document and product information

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- [2.1 Troubleshooting on page 12](#)
- [2.2 Applicable products on page 12](#)
- [2.3 Compatible MFDs on page 13](#)
- [2.4 Incompatible MFDs on page 14](#)
- [2.5 Software updates on page 14](#)

2.1 Troubleshooting

The troubleshooting information provides possible causes and corrective action required for common problems associated with installation and operation of your product.

Before packing and shipping, all Raymarine products are subjected to comprehensive testing and quality assurance programs. If you do experience problems with your product this section will help you to diagnose and correct problems in order to restore normal operation.

If after referring to this section you are still having problems with your product, please refer to the Technical support section of this manual for useful links and Raymarine Product Support contact details.

2.2 Applicable products

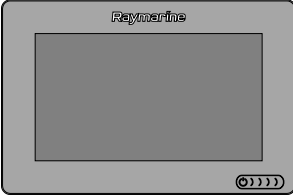
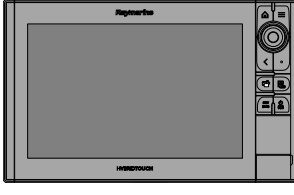

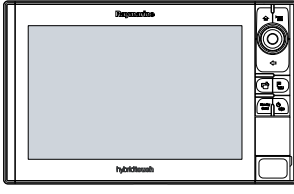
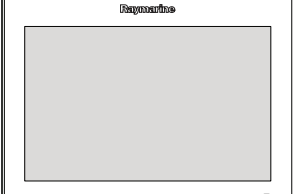
This document is applicable to the following products:

Name	Part number	Description
Ray50	E70243	Base station
Ray52	E70345	Base station
Ray53	E70524	Base station
Ray60	E70245	Base station
Ray63	E70516	Base station
Ray70	E70251	Base station
Ray73	E70517	Base station
Ray90	E70492	Base station
Ray91	E70493	Base station
Wired handset (Raymic)	A80289	Wired handset
Wired speaker (passive)	A80542	Wired speaker (passive)
Wireless hub	A80540	Wireless hub for connecting up to 2 wireless handsets
Wireless hub adaptor	R70739	Enables wireless hub connection for Ray63 / Ray73 radios
Wireless handset (including charging cradle)	A80544	Wireless handset with inductive charging and wireless speaker connection
Wireless speaker (active)	A80543	Active wireless speaker (connects to the wireless handset)

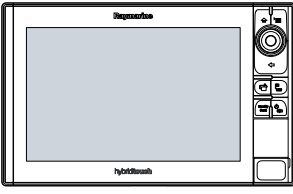
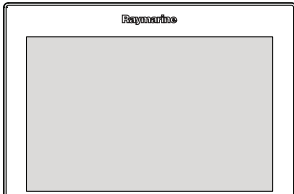
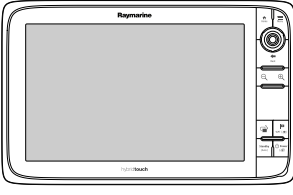
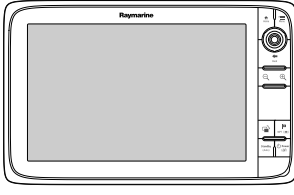
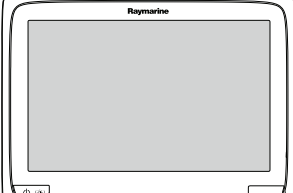
2.3 Compatible MFDs

Your radio can be integrated with compatible MFDs, enabling DSC distress message information and position data on your MFD screen.

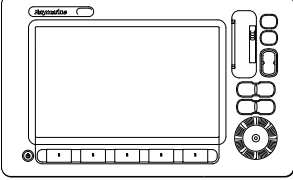
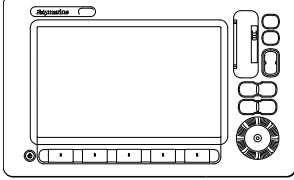
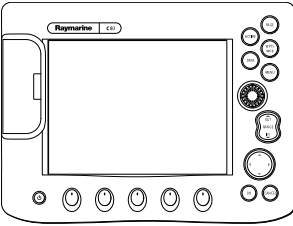
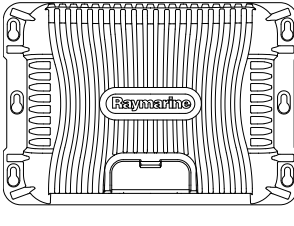
Compatible LightHouse™ 3 MFDs

	Axiom™		Axiom™ Pro
	Axiom™ XL		eS Series
	gS Series		

Compatible LightHouse™ 2 MFDs

	eS Series		gS Series
	e Series		c Series
	a Series		

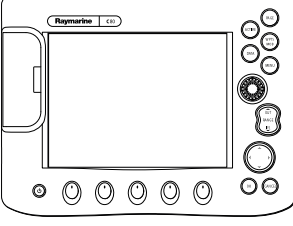
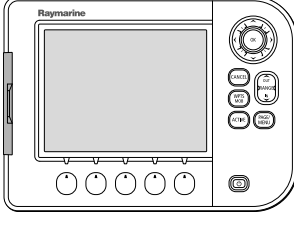
Compatible Legacy MFDs

	E-Series Widescreen		C-Series Widescreen
	E-Series Classic		G-Series

2.4 Incompatible MFDs

This product is NOT compatible with the following legacy Raymarine multifunction displays.

Legacy MFDs

	C-Series Classic		A-Series Classic
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2.5 Software updates

Raymarine periodically releases software updates for its products. These updates provide new features, current feature enhancements and bug fixes which improves product performance and usability.

Check the Raymarine website: www.raymarine.com/software regularly to ensure you have the latest software for your products.

The software update process requires a compatible MFD, powered by LightHouse™ 2 release 13.37 or above, or LightHouse™ 3 version LH3.2 or above.

- Please refer to the operation instructions for your MFD / operating system version for details on how to perform the software update, alternatively refer to the instructions provided on the software download area for your product on the Raymarine website: www.raymarine.com/software.
- The MFD used to perform the software update must be the designated Data master and be connected / networked to the product being updated.
- If you are in any doubt as to the correct procedure for updating your product software, please refer to your local authorized dealer or Raymarine technical support for assistance.

Caution: Installing software updates

The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.

Ensure that the unit has a reliable power supply and that the update process is not interrupted.

Damage caused by an incomplete update is not covered by Raymarine warranty.

By downloading the software update package, you agree to these terms.

Checking software versions

You can check the software version of your radio and connected components.

From the Homescreen:

1. Select **Menu > Set-up > Maintenance > About this unit.**
2. Scroll down.

Software versions of connected components are displayed.

Performing software updates — Raymic handset

If your wired handset is running software version V1.32 or above then the handset will be updated automatically at the same time as the Base station. If your handset is running a software version below V1.32 then your Base station and handset must be updated separately.

- The radio must be connected to a compatible MFD over SeaTalkng®.
 - The Data master MFD must be used to perform software update.
 - Once you have updated your Base station software follow the steps below to update your handset.
1. Ensure a memory card that contains the necessary software files is inserted into the card reader of your MFD.
 2. With the Radio's Base station powered on, turn off the Raymic Handset by pressing the **Power** button located on the top of the Handset.
 3. Press and hold the **Distress** and **PTT** buttons on the Handset.
 4. Press the Handset **Power** button for 1 second, until the backlight turns on, and then release all three buttons.

The Handset is now in update mode.

5. Now check for software updates using your MFD:

- LightHouse™ 2 — From the Homescreen select: **Set-up > Maintenance > Check Card for Updates.**
- LightHouse™ 3 — From the Homescreen select: **Settings > Updated software > Check SD card.**

6. Select your Radio and select **Update.**

(The LCD backlight will flash when the update is in progress.)

7. When the update is complete, check your radios software version.
8. Removed the memory card from the card reader.

Chapter 3: Power up Troubleshooting

Chapter contents

- [3.1 Power up troubleshooting on page 18](#)

3.1 Power up troubleshooting

Problems at power up and their possible causes and solutions are described here.

Product does not turn on or keeps turning off

Possible causes	Possible solutions
Operation	<ol style="list-style-type: none"> 1. Ensure that the radio is fully powered on, by holding the Power button for at least 3 seconds. 2. If your system includes a handset, it has its own independent power button, located on the top edge of the handset. Press and hold the button for at least 3 seconds, until the display lights up.
Blown fuse / tripped breaker	<ol style="list-style-type: none"> 1. Check the fuse, located inline with the power cable. Ensure that it has the correct rating (10 A), as an under-rated fuse can affect the power supplied to the radio. If the fuse has blown, replace with a new 10 A fuse. 2. Check the condition of relevant / additional fuses and breakers and connections, replace if necessary. 3. If fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections	<ol style="list-style-type: none"> 1. Check that the power cable connector is fully inserted into the unit and locked in position. 2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary. 3. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary. 4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 5. With the product under load (when transmitting at 25 W), using a multi-meter, check for a high voltage drop across all connectors /fuses etc, and replace if necessary.
Incorrect power connection	The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient	Check that your power supply (battery or distribution panel) is providing a minimum of 10.2 V to the radio when in standby, and also when transmitting at 25W.

Product will not boot up (re-boot loop)

Possible causes	Possible solutions
Power supply and connection	See possible solutions from 'Products does not turn on or keeps turning off' above.
Software corruption	<p>In the unlikely event that the product's software has become corrupted, please try re-flashing the radio and the handsets with the latest software from the Raymarine website: www.raymarine.com/software</p> <p>If you have a handset in your system (Ray63 / 73 / 90 / 91 only) with old software, you might need to put it into programming mode in order to update the software along with the radio. To do this, connect it and then press and hold the DSC and TRANSMIT buttons together. While holding these buttons, press the Power button on the handset for 3 seconds. The handset</p>

Possible causes	Possible solutions
	backlight will start flashing. This means that the handset is now in programming mode. Follow the update instructions provided on the software download web page.

Chapter 4: Audio Troubleshooting (transmission / reception)

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- [4.1 Audio troubleshooting \(transmission / reception\) on page 22](#)
- [4.2 Checking for RF interference on page 23](#)

4.1 Audio troubleshooting (transmission / reception)

Problems with your VHF radio and their possible causes and solutions are described below:

No audio transmission

Possible Causes	Possible Solutions
Incorrect settings	Reset the radio to factory defaults, using the Maintenance menu: Menu > Set-up > Maintenance > System reset.
Dirt or debris blocking the microphone on the fist mic or Raymic handset.	Check the microphone on the fist mic or Raymic to ensure that the microphone port is clear and not blocked. Clean if necessary.
Incorrect channel type in use.	Ensure you are using only Simplex channels for testing, if communicating with another vessel. For example, channels 6, 8, 9, 10, 13, 67, 72, or 73.
Insufficient transmission power.	When communicating with vessels at a distance, ensure the radio is set to transmit at 25 W power. Press the HI / LO button on the fist mic or the Raymic handset and ensure that the 25 W symbol is displayed.

No audio reception

Possible Causes	Possible Solutions
Incorrect settings	Reset the radio to factory defaults, using the Maintenance menu: Menu > Set-up > Maintenance > System reset.
Incorrect channel type in use.	Ensure you are using only Simplex channels for testing, if communicating with another vessel. For example, channels 6, 8, 9, 10, 13, 67, 72, or 73.
Incorrect volume or squelch level.	<ol style="list-style-type: none"> 1. Firstly, verify that noise is audible from the speakers, by setting the Squelch level to zero. To do this, press the Vol/Sq button a few times until Squelch is displayed. Then adjust the level to zero. 2. If there is no noise from the speaker, try adjusting the volume. To do this, press the Vol/Sq button a few times until Volume is displayed. Then adjust the level as required. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Note: Volume control on each handset in the system and the radio units themselves is independent.</p> </div> <ol style="list-style-type: none"> 3. If audio / noise can be heard, press the Vol/Sq button a few times until Squelch is displayed. Then adjust the squelch level until the noise stops. 4. If no audio / noise is heard from the speaker after completing the above steps, contact Product Support for further guidance.

4.2 Checking for RF interference

If you suspect a device may be causing radio frequency (RF) interference you can use your VHF radio to check.

1. Turn off the suspect device.
2. Tune your VHF radio to a quiet channel such as Channel 13.
3. Adjust your radio's Squelch control until the radio outputs audio noise.
4. Re-adjust your radio's Squelch control until the audio is quiet, only slightly above the noise threshold.
5. Turn on the suspect device.
 - If the radio's audio noise increases then the device is causing RF interference.
 - If there is no change in the radio's audio noise then the device is not causing RF interference.

Note: If RF interference is present then it is likely that both VHF and AIS reception are being degraded by the device.

Multiple antenna installations

Important additional considerations when installing multiple antennas.

To prevent potential channel interference when installing two or more VHF radios on the same vessel, ensure that the antennas are located at least 2.4 m (8 ft.) away from each other.

Passive speaker troubleshooting

Passive speaker no alarm audio

Possible Causes	Possible Solutions
Passive speaker connected to second station connector.	Alarm audio is not available on passive speakers connected to the second station connector. Alarm audio should still be heard via the second station handset.

Chapter 5: DSC Troubleshooting

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- [5.1 DSC troubleshooting on page 26](#)

5.1 DSC troubleshooting

DSC functions are not available / working

Possible Causes	Possible Solutions
MMSI number not programmed.	Programme your MMSI number. Each VHF radio requires a unique MMSI number. In the United States, this MUST be programmed into the unit by an authorized dealer. For more information, refer to: Obtain MMSI (Maritime Mobile Service Identity) number
Radio is set to ATIS or Marcom-C mode.	Use of DSC is not permitted when in ATIS or Marcom-C mode. You will be unable to make DSC distress and other types of digital selective call. If you are not in an ATIS region switch off ATIS mode: Menu > Set-up > ATIS set-up > ATIS.

Obtain MMSI (Maritime Mobile Service Identity) number

Before commencing installation ensure you have obtained a MMSI number for your vessel.

A MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel/station. If your vessel already has a MMSI number (used for a VHF DSC radio) then the same MMSI number must be used to program your product.

Note:

If a MMSI number is not entered, the DSC functionality of your radio will be disabled.

In the United States of America, the MMSI and Static Data must be entered only by a Raymarine® dealer or other appropriately qualified installer of marine communications equipment on board vessels.

The user is NOT authorized to do this.

In some areas, a radio operator licence is required before a MMSI number will be issued. You can request a MMSI number from same agency that issues radio or Ship Radio licences in your area.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

For further details, refer to the relevant Telecommunications Regulatory Body for your area.

Refer to [Appendix A MMSI Regulatory bodies and application submissions](#) for a list of contacts for obtaining MMSI numbers for some areas.

Chapter 6: Wired handset Troubleshooting

Chapter contents

- [6.1 Wired handset troubleshooting on page 28](#)

6.1 Wired handset troubleshooting

Wired handset will not power up

Possible causes	Possible solutions
Handset not turned on	The Wired handset is supplied power from the Base station. Press the Power button located on the top of the Handset to power it on. If you have a handset in your system with old software, you might need to put it into programming mode in order to update the software along with the radio. To do this, connect it and then press and hold the DSC and TRANSMIT buttons together. While holding these buttons, press the Power button on the handset for 3 seconds. The handset backlight will start flashing. This means that the handset is now in programming mode. Follow the update instructions provided on the software download web page.
Software Base station / Handset mismatch	The Handset and Base station must both be running compatible software, refer to the Raymarine website for details of compatible software versions: www.raymarine.com/software .
Poor / damaged / insecure cables / connections	<ol style="list-style-type: none"> 1. Check that the Base station radio is correctly powered. 2. With the Handset turned on, try flexing the cable near to the connectors to see if this causes the Handset to re-boot/lose power, replace if necessary. 3. Check cable connections are secure, clean and free from corrosion, replace if necessary.

Handset display problems

Possible Causes	Possible Solutions
Handset is not powered on	Hold down the Power button located on the top edge of the handset, until the display backlight comes on.
Incompatible software	The handset software may need updating, or there may be a mismatch between the handset and basestation software versions. To update the software, visit www.raymarine.com/software and download the latest software. Ensure the VHF radio is connected via SeaTalkng to a Raymarine multifunction display (MFD), and then follow the instructions provided on the software download website. (The VHF radio software can only be updated via a Raymarine MFD).

Chapter 7: Wireless Troubleshooting (Ray63 / 73 / 90 / 91 only)

Chapter contents

- 7.1 Wireless troubleshooting (Ray63 / 73 / 90 / 91 only) on page 30
- 7.2 LED diagnostics - Wireless (Active) speaker on page 32

7.1 Wireless troubleshooting (Ray63 / 73 / 90 / 91 only)

Before troubleshooting problems with your wireless connection, ensure that you have followed the Wireless location requirements guidance provided in the relevant installation instructions and performed a power cycle/reboot of the devices you are experiencing problems with.

Wireless handset not powering up

Possible cause	Possible solutions
Wireless handset's battery is not charged.	<ol style="list-style-type: none"> 1. Ensure the handset's charging holster is correctly connected to a 12 V dc power supply. 2. Place the handset in the charging holster. 3. Ensure the battery symbol is displayed on the handset screen. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: When charging a very low or completely flat battery, it might take some time for the display to light up once placed in the cradle and charging.</p> </div>

Cannot find network

Possible cause	Possible solutions
Devices not powered or connected.	Ensure the Wireless hub is connected to the Hub connection on the Base station and that the Base station is powered on.
Devices out of range or signal being blocked.	Move devices closer together or, if possible remove the obstructions and then re-scan available networks.
Software mismatch on radio / wireless hub / wireless handset.	The radio, wireless hub, and wireless handset must all be running compatible software. If the software on the radio and handsets is up to date, the wireless hub will update automatically. To obtain information on compatible software versions and also to obtain the latest software, visit the Raymarine website: www.raymarine.com/software

Cannot connect to hub

Possible cause	Possible solutions
Trying to connect to the wrong device.	Ensure you are trying to connect to the correct device; you can find your Wireless hub's name using a Wired handset: (Menu > Set-up > Wireless set-up > Wireless hub set-up > Hub name) .
Incorrect password.	Ensure you are trying to connect using the correct password; you can find your Wireless hub's password using a Wired handset: Password (Menu > Set-up > Wireless set-up > Wireless hub set-up > Password) .
Bulkheads, decks and other heavy structure can degrade and even block the wireless signal. Depending on the material and its thickness, it may not always be possible to pass a wireless signal through certain structures.	<ol style="list-style-type: none"> 1. Try repositioning the Wireless hub so that heavy structure is removed from the direct line-of-sight between the devices, or: 2. Use the Wireless hub antenna extension accessory (A80541) to move the wireless hub to an area with fewer obstacles.

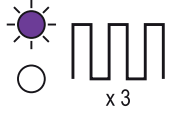

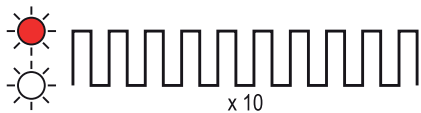
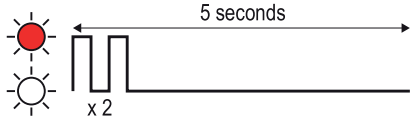
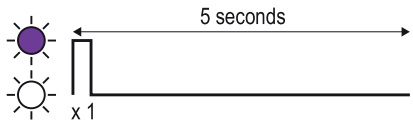
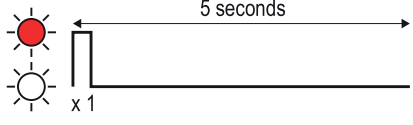
Connection extremely slow and or keeps dropping out

Possible cause	Possible solutions
Wireless performance degrades over distance, so products farther away will receive less network bandwidth. Products installed close to their maximum wireless range will experience slow connection speeds, signal drop outs or no connection at all.	Move devices closer together.
Interference being caused by other wireless-enabled devices.	<ol style="list-style-type: none"> 1. Change the hub's wireless channel and retry the connection. You can use free wireless analyzer apps on your smartphone or tablet to help you choose a less-congested channel. 2. Switch off each wireless device in turn until you have identified the device causing the interference.
Interference caused by other devices that use the 2.4GHz frequency See list below of some common devices that use the 2.4GHz frequency: <ul style="list-style-type: none"> • Microwave ovens • Fluorescent lighting • Cordless phones / baby monitors • Motion sensors 	Switch off each device in turn until you have identified the device causing the interference, then remove or reposition the offending device(s) or your wireless hub / handset..
Interference caused by electrical and electronic devices and associated cabling could generate an electromagnetic field which may interfere with the wireless signal.	Switch off each item in turn until you have identified the device causing the interference, then remove or reposition the offending device(s) or your wireless hub / handset.
Interference from devices on other vessels. When in close proximity to other vessels, many other wireless signals may be present; for example, when moored up in a marina.	<ol style="list-style-type: none"> 1. Change the hub's wireless channel and retry the connection. You can use free wireless analyzer apps on your smartphone or tablet to help you choose a less congested channel. 2. If possible, move your vessel to a location with less wireless traffic.

Network connection established but no data

Possible cause	Possible solutions
Connected to the wrong network.	Ensure that your handset is connected to the correct wireless hub.
Device software incompatibility.	<p>The radio, wireless hub, and wireless handset must all be running compatible software. If the software on the radio and handsets is up to date, the wireless hub will update automatically. You can check device software from the Maintenance menu: Menu > Set-up > Maintenance > About this unit.</p> <p>To obtain information on compatible software versions and also to obtain the latest software, visit the Raymarine website: www.raymarine.com/software</p>
It may be possible that the device has become defective.	<ol style="list-style-type: none"> 1. Try updating software to a later version, or try reinstalling the current software. 2. Contact technical support for further assistance.

7.2 LED diagnostics - Wireless (Active) speaker

Sequence	Color	Status
	Purple	Powering on
	Red and Blue	Ready to pair/connect
	Red	Paired ok
	Red	Connected, no audio
	Purple	Connected, audio active
	Red	Powered on, not connected

Chapter 8: AIS Troubleshooting (Ray70 / 73 / 91 only)

Chapter contents

- [8.1 AIS troubleshooting \(Ray70 / 73 / 91 only\) on page 34](#)

8.1 AIS troubleshooting (Ray70 / 73 / 91 only)

AIS functions are not available / working (Ray70 / Ray73 / Ray91 only)

Possible Causes	Possible Solutions
MMSI number not programmed.	Programme your MMSI number. Each VHF radio requires a unique MMSI number. In the United States, this MUST be programmed into the unit by an authorized dealer. For more information, refer to: Obtain MMSI (Maritime Mobile Service Identity) number
VHF radio is not connected to a multifunction display via SeaTalkng / NMEA, or the connection is not correctly configured.	Check the diagnostics on the multifunction display to confirm that the VHF radio is connected on the network. Access the VHF radio's Set-up menu and ensure that the Network output option is set correctly. If the VHF radio is connected to an MFD via NMEA 0183, ensure that the VHF radio's Network output option in the Set-up menu is set to "0183 High Speed". Ensure also that the MFD's NMEA 0183 connection is configured to 38400 baud rate.
AIS functions are not enabled on the VHF radio.	Access the VHF radio's Set-up menu and ensure that the AIS option is set to "On".
AIS functions are not enabled on the MFD.	Ensure that both AIS Presentation and AIS Targets are enabled for the MFD. For instructions on how to do this, refer to the Operation instructions for your MFD.

Chapter 9: GNSS (GPS) Troubleshooting

Chapter contents

- [9.1 GNSS \(GPS\) troubleshooting on page 36](#)

9.1 GNSS (GPS) troubleshooting

Problems with the GNSS (GPS) and their possible causes and solutions are described below.

Before troubleshooting GNSS (GPS) problems, ensure your product has the latest software, by checking the Software Updates page on the Raymarine website www.raymarine.com/software

No fix

Possible causes	Possible solutions
No GNSS (GPS) receiver connected.	In order to obtain a position fix your product requires a GNSS (GPS) receiver. Your product may include an internal GNSS (GPS) receiver, if not then an external GNSS (GPS) receiver such as the RS150 is required.
No antenna connected to GNSS (GPS) receiver.	Depending on variant, your product may include an internal GNSS (GPS) receiver. The receiver may or may not include an internal antenna. If your product's internal GNSS (GPS) receiver does not include an internal antenna then you will need to connect an external passive antenna to the GNSS (GPS) / GA150 connection.
GNSS (GPS) Antenna location.	For optimum performance, external GNSS (GPS) antennas and GNSS (GPS) receivers that include an internal antenna should be mounted above decks and have a clear, unobstructed view of the sky, and not be in close proximity to any structural bulkheads or other electrical equipment or cables which may cause interference.
GNSS (GPS) switched off.	Ensure your internal GNSS (GPS) receiver is switched on in the relevant settings menu.
Geographic location or prevailing conditions preventing satellite fix.	Check periodically to see if a fix is obtained in better conditions or another geographic location.

No position data

Possible causes	Possible solutions
Internal receiver is switched off.	Ensure your external or internal receiver is switched on.
Wrong Network output selected.	Ensure the correct network type and speed is selected in the Network output menu: Menu > Set-up > Network output .
Poor / damaged / insecure cable / connection.	<ol style="list-style-type: none"> 1. Check that the connectors are fully inserted into the unit and locked in position. 2. Check the cables and connectors for signs of damage or corrosion, replace if necessary.

Chapter 10: General Troubleshooting

Chapter contents

- 10.1 Performing a system reset on page 38
- 10.2 LED diagnostics — Ray90 / Ray91 Base station on page 38

10.1 Performing a system reset

Note: Performing a reset will not reset MMSI and ATIS ID number.

From the Maintenance menu: **Menu > Set-up > Maintenance.**

1. Select **System reset.**
2. Select **Yes.**

The system is now reset to factory defaults.

Note: Performing the reset will delete all contacts in your phonebook and reset all user options.

System test

The system test menu can be used to show the status of the system and connected devices.

The System test menu show the status of the following system components and connected devices:

- GPS
- DSC
- Battery
- Hailer
- Remote handset
- **OK** is displayed next to each item that is either connected or enabled
- **No** is displayed next to items that are either not connected or disabled.

10.2 LED diagnostics — Ray90 / Ray91 Base station

Sequence	Color	Status
	Green	<ul style="list-style-type: none"> • SeaTalkng® Bus healthy, no communication faults. • All modules ready (GPS, VHF, AIS).
	Red	<ul style="list-style-type: none"> • SeaTalkng® Bus not connected. • NMEA 0183 not connected.
	Red	<ul style="list-style-type: none"> • Connected but not receiving data.
	Green	<ul style="list-style-type: none"> • VHF transceiver module initializing / not ready.
	Green	<ul style="list-style-type: none"> • GNSS (GPS) sensor initializing / not ready.
	Red	<ul style="list-style-type: none"> • Internal fault (No GNSS (GPS) signal, No antenna, lost signal).

Chapter 11: Technical support

Chapter contents

- 11.1 Raymarine product support and servicing on page 40
- 11.2 Viewing product information on page 41

11.1 Raymarine product support and servicing

Raymarine provides a comprehensive product support service, as well as warranty, service, and repairs. You can access these services through the Raymarine website, telephone, and e-mail.

Product information

If you need to request service or support, please have the following information to hand:

- Product name.
- Product identity.
- Serial number.
- Software application version.
- System diagrams.

You can obtain this product information using diagnostic pages of the connected MFD.

Servicing and warranty

Raymarine offers dedicated service departments for warranty, service, and repairs.

Don't forget to visit the Raymarine website to register your product for extended warranty benefits: <http://www.raymarine.co.uk/display/?id=788>.

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	<ul style="list-style-type: none">• E-Mail: emea.service@raymarine.com• Tel: +44 (0)1329 246 932
United States (US)	<ul style="list-style-type: none">• E-Mail: rm-usrepair@flir.com• Tel: +1 (603) 324 7900

Web support

Please visit the “Support” area of the Raymarine website for:

- **Manuals and Documents** — <http://www.raymarine.com/manuals>
- **Technical support forum** — <http://forum.raymarine.com>
- **Software updates** — <http://www.raymarine.com/software>

Worldwide support

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	<ul style="list-style-type: none">• E-Mail: support.uk@raymarine.com• Tel: +44 (0)1329 246 777
United States (US)	<ul style="list-style-type: none">• E-Mail: support@raymarine.com• Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)
Australia and New Zealand (Raymarine subsidiary)	<ul style="list-style-type: none">• E-Mail: aus.support@raymarine.com• Tel: +61 2 8977 0300
France (Raymarine subsidiary)	<ul style="list-style-type: none">• E-Mail: support.fr@raymarine.com• Tel: +33 (0)1 46 49 72 30
Germany (Raymarine subsidiary)	<ul style="list-style-type: none">• E-Mail: support.de@raymarine.com• Tel: +49 (0)40 237 808 0
Italy (Raymarine subsidiary)	<ul style="list-style-type: none">• E-Mail: support.it@raymarine.com• Tel: +39 02 9945 1001
Spain (Authorized Raymarine distributor)	<ul style="list-style-type: none">• E-Mail: sat@azimut.es• Tel: +34 96 2965 102
Netherlands (Raymarine subsidiary)	<ul style="list-style-type: none">• E-Mail: support.nl@raymarine.com• Tel: +31 (0)26 3614 905

Region	Contact
Sweden (Raymarine subsidiary)	<ul style="list-style-type: none"> E-Mail: support.se@raymarine.com Tel: +46 (0)317 633 670
Finland (Raymarine subsidiary)	<ul style="list-style-type: none"> E-Mail: support.fi@raymarine.com Tel: +358 (0)207 619 937
Norway (Raymarine subsidiary)	<ul style="list-style-type: none"> E-Mail: support.no@raymarine.com Tel: +47 692 64 600
Denmark (Raymarine subsidiary)	<ul style="list-style-type: none"> E-Mail: support.dk@raymarine.com Tel: +45 437 164 64
Russia (Authorized Raymarine distributor)	<ul style="list-style-type: none"> E-Mail: info@mikstmarine.ru Tel: +7 495 788 0508

11.2 Viewing product information

Product information can be found on the Startup screen.

1. Power up the radio.

The startup screen is displayed which shows the model and software version of the product.

Alternatively product information can also be displayed by selecting **About this unit** from the **Maintenance** menu: **Menu > Set-up > Maintenance**.

Appendix A MMSI Regulatory bodies and application submissions

Country	Regulatory Body	Website links
UK	Ofcom	http://www.ofcom.org.uk
USA	FCC (www.fcc.gov)	<ul style="list-style-type: none"> • www.boatus.com • www.seatow.com • www.usps4mmsi.com
Canada	Industry Canada	www.ic.gc.ca
Australia	Australian Maritime Safety Authority (AMSA)	http://www.amsa.gov.au/mmsi/
Holland	Agentschap Telecom	www.agentschaptelecom.nl
Belgium	Belgisch Instituut voor Postdiensten en Telecommunicatie	www.bipt.be
Germany	Bundesnetzagentur	https://www.bundesnetzagentur.de/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/SpezielleAnwendungen/Seefunk/Seefunk-node.html
Denmark	søfartsstyrelsen	www.sofartsstyrelsen.dk
France	Agence Nationale Des Fréquences	https://www.anfr.fr/licences-et-autorisations/radiomaritime/
Italy	Ministero dello sviluppo economico - Direzione generale per le attività territoriali	http://www.sviluppoeconomico.gov.it/images/stories/documenti/mmsinew.pdf
Spain	Ministero De Fomento	https://www.fomento.gob.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/MARINA_MERCANTE/RADIOCOMUNICACIONES/MMSI/
Sweden	PTS	www.pts.se
Finland	Viestintävirasto	https://www.viestintavirasto.fi/en/spectrum/radiolices/B0atingandnavigation.html
Iceland	Post and telecom administration in Iceland	www.pfs.is
New Zealand	Radio Spectrum Management	https://www.rsm.govt.nz/licensing/radio-operator-certificates-and-callsigns?searchterm=MMSI
Chile	Directemar	www.nauticentro.cl
Panama	Autoridad Maritima de Panama	www.amp.gob.pa/newside/spanish/puertos2/de-pima/ima.html

Appendix B VHF Channels

International Marine VHF Channels and Frequencies

CH No.	TX Freq	RX Freq (MHz)	Single Freq (MHz)	Use
01	156.050	160.650		Public correspondence, Port operations and Ship movement.
02	156.100	160.700		Public correspondence, Port operations and Ship movement.
03	156.150	160.750		Public correspondence, Port operations and Ship movement.
04	156.200	156.800		Public correspondence, Port operations and Ship movement.
05	156.250	156.850		Public correspondence, Port operations and Ship movement.
06	156.300	156.300	x	Intership. Coordinated search and rescue and ship stations working frequency
07	156.350	160.950		Public correspondence, Port operations and Ship movement.
08	156.400	156.400	x	Intership. Preferred intership channel
09	156.450	156.450	x	Intership, Port operations and Ship movement.
10	156.500	156.500	x	Intership, Port operations and Ship movement. SAR, Pollution incidents, MSI broadcasts coordinated with HMCG.
11	156.550	156.550	x	Port operations and Ship movement.
12	156.600	156.600	x	Port operations and Ship movement.
13	156.650	156.650	x	Intership navigation safety (Bridge-to-bridge). International navigation safety channel. May also be used for ship movement, port operations and limited coast stations.
14	156.700	156.700	x	Port operations and Ship movement.
15	156.750	156.750	x	On-board communications. 1 watt maximum power.
16	156.800	156.800	x	International Distress, Safety and Calling.
17	156.850	156.850	x	On-board communications. 1 watt maximum power.
18	156.900	161.500		Public correspondence, Port operations and Ship movement.
19	156.950	161.550		Public correspondence, Port operations and Ship movement.
1019	156.950	156.950	x	Port operations and Ship movement.
2019	161.550	161.550	x	Port operations and Ship movement. Channel is limited to coast stations only unless otherwise permitted by UK regulation.
20	157.000	161.600		Public correspondence, Port operations and Ship movement.
1020	157.000	157.000	x	Public correspondence, Port operations and Ship movement.
2020	161.600	161.600	x	Public correspondence, Port operations and Ship movement. Channel is limited to coast stations only unless otherwise permitted by UK regulation.
21	157.050	161.650		Public correspondence, Port operations and Ship movement. Available for VDSMS
22	157.100	161.700		Public correspondence, Port operations and Ship movement. Available for VDSMS
23	157.150	161.750		Safety. HNCG – SAR and MSI broadcasts.
24	157.200	161.800		Public correspondence, Port operations and Ship movement. Available for VDSMS

CH No.	TX Freq	RX Freq (MHz)	Single Freq (MHz)	Use
1024	157.200	157.200	x	For future use
2024	161.800	161.800	x	For future use
25	157.250	161.850		Public correspondence, Port operations and Ship movement. Available for VDSMS
1025	157.250	157.250	x	For future use
2025	161.850	161.850	x	For future use
26	157.300	161.900		Public correspondence, Port operations and Ship movement. Available for VDSMS
1026	157.300	157.300	x	For future use
2026	161.900	161.900	x	For future use
27	157.350	161.950		Public correspondence, Port operations and Ship movement. Available for testing of new AIS applications.
1027	157.350	157.350	x	Port operations and Ship movement.
2027	161.950	161.950	x	Application specific message (ASM1)
28	157.400	162.000		Public correspondence, Port operations and Ship movement. Available for testing of new AIS applications.
1028	157.400	157.400	x	Port operations and Ship movement.
2028	162.00	162.00	x	Application specific message (ASM2)
60	156.025	160.625		Public correspondence, Port operations and Ship movement.
61	156.075	160.675		Public correspondence, Port operations and Ship movement.
62	156.125	160.725		Public correspondence, Port operations and Ship movement.
63	156.175	160.775		Public correspondence, Port operations and Ship movement.
64	156.225	160.825		Public correspondence, Port operations and Ship movement.
65	156.275	160.875		UK National Coastwatch.
66	156.325	160.925		Public correspondence, Port operations and Ship movement.
67	156.375	156.375	x	Intership, Port operations and Ship movement. HMCG — SAR and Safety.
68	156.425	156.425	x	Port operations and Ship movement.
69	156.475	156.475	x	Intership, Port operations and Ship movement.
71	156.575	156.575	x	Port operations and Ship movement.
72	156.625	156.625	x	Intership. Preferred intership channel.
73	156.675	156.675	x	Intership, Port operations and Ship movement. HMCG — SAR and MSI broadcasts.
74	156.725	156.725	x	Port operations and Ship movement.
75	156.775	156.775	x	Intership Navigation related communications only with 1 watt maximum power.
76	156.825	156.825	x	Intership Navigation related communications only with 1 watt maximum power.
77	156.875	156.875	x	Intership. Preferred intership channel.
78	156.925	161.525		Public correspondence, Port operations and Ship movement.
1078	156.925	156.925	x	Port operations and Ship movement.

CH No.	TX Freq	RX Freq (MHz)	Single Freq (MHz)	Use
2078	161.525	161.525	x	Port operations and Ship movement. Channel is limited to coast stations only unless otherwise permitted by UK regulation.
79	156.975	161.575		Public correspondence, Port operations and Ship movement.
1079	156.975	156.975	x	Port operations and Ship movement.
2079	161.575	161.575	x	Port operations and Ship movement. Channel is limited to coast stations only unless otherwise permitted by UK regulation.
80	157.025	161.625		Public correspondence, Port operations and Ship movement. Also marinas and yacht clubs UK only. Available for VDSMS.
81	157.075	161.675		Public correspondence, Port operations and Ship movement. Available for VDSMS
82	157.125	161.725		Public correspondence, Port operations and Ship movement. Available for VDSMS
83	157.175	161.775		Public correspondence, Port operations and Ship movement. Available for VDSMS
84	157.225	161.825		Port operations and Ship movement. HMCG — SAR and MSI broadcasts.
1084	157.225	157.225	x	For future use
2084	161.825	161.825	x	For future use
85	157.275	161.875		Public correspondence, Port operations and Ship movement. Available for VDSMS
1085	157.275	157.275	x	For future use
2085	161.875	161.875	x	For future use
86	157.325	161.925		Port operations and Ship movement. HMCG — SAR and MSI broadcasts.
1086	157.325	157.325	x	For future use
2086	161.925	161.925	x	For future use
87	157.375	157.375	x	Port operations and Ship movement. Available for testing of new AIS applications.
88	157.425	157.425	x	Port operations and Ship movement. Available for testing of new AIS applications.

Please be aware that:

- Intership channels are for communications between ship stations. Intership communications should be restricted to channels 6, 8, 72 and 77. If these are not available, the other channels marked for Intership may be used.
- Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.

Note:

1. Channel 06 may also be used for communications between ship stations and aircraft engaged in coordinated search and rescue operations. Ship stations should avoid harmful interference to such communications on channel 06 as well as to communications between aircraft stations, ice breakers and assisted ships during ice seasons.
2. Within the European Maritime Area and in Canada, channels 10, 67 and 73 may also be used by the individual administrations concerned for communication between ship stations, aircraft stations and participating land stations engaged in coordinated search and rescue and anti-pollution operations in local areas. Channel 10 or 73 (depending on location) are also used for the broadcast of Marine Safety Information by the Maritime and Coast Guard Agency in the UK only.
3. Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications.

4. Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 Watt.
5. The use of channels 75 and 76 should be restricted to navigation related communications only and all precautions should be taken to avoid harmful interference to channel 16. Transmit power is limited to 1 Watt.

Private Channels (Europe only)

Country	Channel Designations	TX Freq	RX Freq	Channel Use
Belgium	96	162.425	162.425	Marina
Denmark	L1	155.500	155.500	Pleasure
	L2	155.525	155.525	Pleasure
Finland, Norway & Sweden	L1	155.500	155.500	Pleasure
	L2	155.525	155.525	Pleasure
	L3	155.650	155.650	Pleasure
Holland (Netherlands)	31	157.550	162.150	Marina
	37	157.850	157.850	Leisure
Denmark, Finland, Norway & Sweden	F1	155.625	155.625	Fishing
	F2	155.775	155.775	Fishing
	F3	155.825	155.825	Fishing
United Kingdom	M1	157.850	157.850	Marina
	M2	161.425	161.425	Marina

The national channels listed above have been allocated for the specific use within the countries listed. To use these channels you must have the appropriate license.

US Marine VHF Channels and Frequencies

Note:

Some of the channel numbers have recently changed. For completeness, both old and new numbers are shown in the table below.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Use
1001	01A	156.050	156.050	x	Port operations and commercial, VTS. Available only in New Orleans / Lower Mississippi area.
1005	05A	156.250	156.250	x	Port operations or VTS in the Houston, New Orleans and Seattle areas.
06	06	156.300	156.300	x	Intership Safety.
1007	07A	156.350	156.350	x	Commercial. VDSMS.
08	08	156.400	156.400	x	Commercial (Intership only). VDSMS.
09	09	156.450	156.450	x	Boater calling. Commercial and Non-commercial. VDSMS.
10	10	156.500	156.500	x	Commercial. VDSMS.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Use
11	11	156.550	156.55 0	x	Commercial. VTS in selected areas. VDSMS.
12	12	156.600	156.60 0	x	Port operations. VTS in selected areas.
13	13	156.650	156.65 0	x	Intership navigation safety (Bridge-to-bridge). Ships >20 metres in length maintain a listening watch on this channel in US waters.
14	14	156.700	156.700	x	Port operations. VTS in selected areas.
15	15	-	156.750	x	Environmental (Receive only). Used by Class 'C' EPIRBs.
16	16	156.800	156.80 0	x	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
17	17	156.850	156.85 0	x	State Control.
1018	18A	156.900	156.90 0	x	Commercial. VDSMS.
1019	19A	156.950	156.95 0	x	Commercial. VDSMS.
20	20	157.000	161.600		Port operations (duplex).
1020	20A	157.000	157.00 0	x	Port operations.
1021	21A	157.050	157.050	x	US Coast Guard only.
1022	22A	157.100	157.100	x	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
1023	23A	157.150	157.150	x	US Coast Guard only.
24	24	157.200	161.800		Public correspondence (Marine operator).
25	25	157.250	161.850		Public correspondence (Marine operator).
26	26	157.300	161.900		Public correspondence (Marine operator).
27	27	157.350	161.950		Public correspondence (Marine operator).
28	28	157.400	162.00 0		Public correspondence (Marine operator).
1063	63A	156.175	156.175	x	Port operations and commercial VTS, Available only in New Orleans / Lower Mississippi area.
1065	65A	156.275	156.275	x	Port operations.
1066	66A	156.325	156.325	x	Port operations.
67	67	156.375	156.375	x	Commercial. Used for bridge-to-bridge communications in lower Mississippi river (Intership only).
68	68	156.425	156.425	x	Non-commercial. VDSMS.
69	69	156.475	156.475	x	Non-commercial. VDSMS.
71	71	156.575	156.575	x	Non-commercial. VDSMS.
72	72	156.625	156.62 5	x	Non-commercial (Intership only). VDSMS.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Use
73	73	156.675	156.675	x	Port operations.
74	74	156.725	156.725	x	Port operations.
77	77	156.875	156.875	x	Port operations (Intership only).
1078	78A	156.925	156.925	x	Non-commercial. VDSMS.
1079	79A	156.975	156.975	x	Commercial. Non-commercial in Great Lakes only. VDSMS.
1080	80A	157.025	157.025	x	Commercial. Non-commercial in Great Lakes only. VDSMS.
1081	81A	157.075	157.075	x	US Government only – Environmental protection operations.
1082	82A	157.125	157.125	x	US Government only.
1083	83A	157.175	157.175	x	US Coast Guard only.
84	84	157.225	161.825		Public correspondence (Marine operator). VDSMS.
85	85	157.275	161.875		Public correspondence (Marine operator). VDSMS.
86	86	157.325	161.925		Public correspondence (Marine operator). VDSMS.
87	87	157.375	161.975		Public correspondence (Marine operator). VDSMS.
88	88	157.425	157.425		Commercial, Intership only. VDSMS.

Please be aware that:

- Recreational boaters normally use channels listed as Non-commercial: 68, 69, 71, 72 1078.
- Channel 70 is used exclusively for DSC and is not available for regular voice communications.
- Channels 75 and 76 are reserved as guards bands for channel 16 and are not available for regular voice communications.

Note:

1. Four digit channels indicate simplex use of the ship station transmit side of an international semi-duplex channel. Operations are different from that of international operations on that channel.
2. Channel 13 should be used to contact a ship when there is danger of collision. All ships of length 20 metres or greater are required to guard VHF channel 13, in addition to VHF channel 16, when operating within US territorial waters.
3. Channel 15 is receive only.
4. Channel 16 is used for calling other stations or for distress calls.
5. Channel 17 and channel 77 have a fixed power output of 1 watt.
6. Channel 13 and channel 67 have an initial power output of 1 watt. User can temporarily override this restrictions to transmit at high power.
7. VDSMS (VHF Digital Small Message Services). Transmissions of short digital messages in accordance with RTCM Standard 12301.1 is allowed.

WX Channels (North America only)

Weather Channel	Frequency in MHz
WX1	162.550
WX2	162.400

Weather Channel	Frequency in MHz
WX3	162.475
WX4	162.425
WX5	162.450
WX6	162.500
WX7	162.525
WX8	161.650
WX9	161.775
WX10	163.275

Canadian Marine VHF Channels and Frequencies

Note:

Some of the channel numbers have recently changed. For completeness, both old and new numbers are shown in the table below.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Areas of operation	Use
01	01	156.050	160.650		BCC	Public correspondence.
02	02	156.100	160.700		BCC	Public correspondence.
03	03	156.150	160.750		BCC	Public correspondence.
1004	04A	156.200	156.200	x	BCC, EC	Intership, Ship/Shore, Commercial and Safety DFO / Canadian Coast Guard only in BCC area. Commercial fishing in EC area.
1005	05A	156.250	156.250	x	AC, BCC, EC, GL, NL, INLD BC, WC	Ship movement.
06	06	156.300	156.300	x	All areas	Intership, Commercial, Non-Commercial and Safety Maybe used for search and rescue communications between ships and aircraft.
1007	07A	156.350	156.350	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore and Commercial.
08	08	156.400	156.400	x	EC, INLD BC, WC	Intership, Commercial and Safety. Also assigned for Intership in the Lake Winnipeg area.
09	09	156.450	156.450	x	AC, INLD PRA, BCC	Intership, Ship/Shore, Commercial, Non-commercial, Safety and Ship movement. Commercial — BCC area. May be used to communicate with aircraft and helicopters in predominantly maritime support operations.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Areas of op- eration	Use
10	10	156.50 0	156.50 0	x	AC, BCC, GL	Intership, Ship/Shore, Commercial, Non-commercial, Safety and Ship movement. Commercial — BCC area. May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
11	11	156.55 0	156.55 0	x	AC, BCC, GL	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. VTS — BCC area. Also used for pilotage purposes.
12	12	156.60 0	156.60 0	x	AC, BCC, GL, WC	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. VTS — BCC area. Port operations and pilot information and messages.
13	13	156.65 0	156.65 0	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Commercial, Non-commercial and Ship movement. VTS — BCC area. Bridge-to-bridge navigational traffic.
14	14	156.70 0	156.70 0	x	AC, BCC, GL	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. VTS — BCC area. Port operations and pilot information and messages.
15	15	156.75 0	156.75 0	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. Port operations and Ship movement — BCC area. All operations limited to 1 watt maximum power. May also be used for on-board communications.
16	16	156.80 0	156.80 0	x	All areas	International distress, safety and calling.
17	17	156.85 0	156.85 0	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. Port operations and Ship movement — BCC area. All operations limited to 1 watt maximum power. May also be used for on-board communications.
1018	18A	156.90 0	156.90 0	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore and Commercial. Towing — BCC area.
1019	19A	156.95 0	156.95 0	x	All areas	Intership and Ship/Shore. DFO / Canadian Coast Guard. Pacific Pilots — BCC area.
20	20	157.00	161.60 0		AC, BCC, EC, GL, NL, INLD BC, WC	Ship/Shore, Safety and Ship movement. Port operations only with 1 watt maximum power.
1021	21A	157.05 0	157.05 0	x	All areas	Intership and Ship/Shore. DFO / Canadian Coast Guard only.
2021	21B	-	161.65 0	x	All areas	Safety Continuous Marine Broadcast (CMB) service.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Areas of op- eration	Use
1022	22A	157.100	157.10 0	x	All areas	Intership, Ship/Shore, Commercial and Non-commercial. For communications between Canadian Coast Guard and non-Canadian Coast Guard stations only.
23	23	157.150	161.75 0		BCC, INLD BC	Ship/Shore and Public correspondence.
2023	-	-	161.75 0	x	GL	Safety Continuous Marine Broadcast (CMB) service.
24	24	157.20 0	161.80 0		All areas	Ship/Shore and Public correspondence.
25	25	157.25 0	161.85 0		BCC	Ship/Shore and Public correspondence.
2025	25B	-	161.85 0	x	AC	Safety Continuous Marine Broadcast (CMB) service.
26	26	157.30 0	161.90 0		All areas	Safety and Public correspondence.
27	27	157.35 0	161.95 0		AC, BCC, GL	Ship/Shore and Public correspondence.
28	28	157.40 0	162.00		BCC	Ship/Shore, Safety and Public correspondence.
2028	28B	-	162.00 0	x	AC, GL	Safety Continuous Marine Broadcast (CMB) service.
60	60	156.02 5	160.62 5		BCC	Ship/Shore and Public correspondence.
1061	61A	156.07 5	156.07 5	x	BCC	Intership, Ship/Shore and Commercial DFO / Canadian Coast Guard only in BCC area. Commercial fishing only in EC area.
1062	62A	156.125	156.12 5	x	BCC, EC	Intership, Ship/Shore and Commercial DFO / Canadian Coast Guard only in BCC area. Commercial fishing only in EC area.
1063		156.175	156.17 5	x	BCC	Intership, Ship/Shore and Commercial. Tow boats — BCC area.
64	64	156.22 5	160.82 5		BCC	Ship/Shore and Public correspondence.
1064	64A	156.22 5	156.22 5	x	EC	Intership, Ship/Shore and Commercial Commercial fishing only.
1065	65A	156.27 5	156.27 5	x	All areas	Intership, Ship/Shore, Safety, Commercial and Non-commercial. Search and rescue and antipollution operations on the Great Lakes. Towing on the Pacific coast. Port operations only in the St. Lawrence river area with 1 watt maximum power. Intership in INLD PRA area.
1066	66A	156.32 5	156.32 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Safety, Commercial and Non-commercial. Port operations only in the St. Lawrence river / Great Lakes areas with 1 watt maximum power. 1 watt marine channel in BCC area.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Areas of op- eration	Use
67	67	156.37 5	156.37 5	x	All areas	Intership Ship/Shore, Safety, Commercial and Non-commercial. May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations. Commercial fishing only in EC and INLD PRA areas. Pleasure craft — BCC area.
68	68	156.42 5	156.42 5	x	All areas	Intership, Ship/Shore and Non-commercial. For marinas, yacht clubs and pleasure craft.
69	69	156.47 5	156.47 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Commercial and Non-commercial. Commercial fishing only — EC area. Pleasure craft — BCC area.
71	71	156.57 5	156.57 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Safety, Commercial,, Non-commercial and Ship movement. Ship movement — BCC area. Marinas and yacht clubs — EC area and on Lake Winnipeg.
72	72	156.62 5	156.62 5	x	BCC, EC	Intership, Commercial and Non-commercial May be used to communicate with aircraft and helicopters in predominantly maritime support operations. Pleasure craft — BCC area.
73	73	156.67 5	156.67 5	x	All areas	Intership, Ship/Shore, Safety, Commercial and Non-commercial. May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations. Commercial fishing only in EC and INLD PRA areas.
74	74	156.72 5	156.72 5	x	BCC, EC	Intership, Ship/Shore, Commercial, Non-commercial and Ship movement. VTS and Ship movement — BCC area.
75		156.77 5	156.77 5	x	All areas	Intership, Ship/Shore, Commercial and Ship movement. Simplex port operation, ship movement and navigation related communication only. 1 watt maximum power.
76		156.82 5	156.82 5	x	All areas	Intership, Ship/Shore, Commercial and Ship movement. Simplex port operation, ship movement and navigation related communication only. 1 watt maximum power.
77	77	156.87 5	156.87 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore, Safety and Ship movement. Pilotage BCC area, 25 watts. Port operations only in the St. Lawrence River/Great Lakes areas with 1 watt maximum power.
1078	78A	156.92 5	156.92 5	x	BCC, EC	Intership, Ship/Shore and Commercial. Fishing industry — BCC area.
1079	79A	156.97 5	156.97 5	x	BCC, EC	Intership, Ship/Shore and Commercial. Fishing industry — BCC area.
1080	80A	157.02 5	157.02 5	x	BCC, EC	Intership, Ship/Shore and Non-commercial. Whale watching — BCC area.

(New) CH No.	(Old) CH No.	TX Freq (MHz)	RX Freq (MHz)	Single Freq	Areas of op- eration	Use
1081	81A	157.07 5	157.07 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership, Ship/Shore and Safety. DFO / Canadian Coast Guard use only.
1082	82A	157.125	157.12 5	x	AC, BCC, EC, GL, NL, INLD BC, WC	Intership and Ship/Shore. DFO / Canadian Coast Guard use only.
1083	83A	157.175	157.17 5	x	BCC, EC	Intership and Ship/Shore DFO / Canadian Coast Guard and other government agencies.
2083	83B	-	161.77 5	x	AC, BCC, GL	Safety Continuous Marine Broadcast (CMB) service.
84	84	157.22 5	161.82 5		BCC	Ship/Shore and Public correspondence.
85	85	157.27 5	161.87 5		AC, BCC, GL ,NL	Ship/Shore and Public correspondence.
86	86	157.32 5	161.92 5		BCC	Ship/Shore and Public correspondence.
87	87	157.37 5	157.37 5	x	AC, BCC, GL, NL	Intership, Non-commercial and Ship movement. Port operation and ship movement — EC area. Pleasure craft — BCC area.
88	88	157.42 5	157.42 5	x	AC, BCC, GL, NL	Intership, Commercial and Ship movement. Port operation and ship movement — BCC area.

Area of operation:

- **AC** — Atlantic Coast, Gulf and St. Lawrence River up to and including Montreal.
- **BCC** — British Columbia Coast (Pacific Coast).
- **EC** — East Coast: includes NL, AC, GL and Eastern Arctic areas.
- **GL** — Great Lakes: includes St. Lawrence above Montreal.
- **NL** — Newfoundland and Labrador.
- **WC** — West Coast: includes BCC, Western Arctic and Athabasca-Mackenzie Watershed areas.
- **INLD BC** — Inland waters of BC and the Yukon
- **INLD PRA** — Inland waters of MB, SK and AB

Note:

1. Four digit channels indicate simplex use of the ship station transmit side of an international semi-duplex channel. Operations are different from that of international operations on that channel.
2. Channel 16 is used for calling other stations or for distress calls.
3. Channel 70 is used exclusively for Digital Selective Calling and is not available for regular voice communications.

Appendix C Phonetic alphabet

To help make call letters more clearly understood, and to assist in spelling out similar sounding or unfamiliar word, radiotelephone users employ the international phonetic alphabet.

A	ALPHA	N	NOVEMBER
B	BRAVO	O	OSCAR
C	CHARLIE	P	PAPA
D	DELTA	Q	QUEBEC
E	ECHO	R	ROMEO
F	FOXTROT	S	SIERRA
G	GOLF	T	TANGO
H	HOTEL	U	UNIFORM
I	INDIA	V	VICTOR
J	JULIET	W	WHISKEY
K	KILO	X	X-RAY
L	LIMA	Y	YANKEE
M	MIKE	Z	ZULU

Appendix D Prowords

Prowords can be used to simplify and speed up radio communications.

Proword	Meaning
ACKNOWLEDGE	Have you received and understood?
CONFIRM	Is that correct?
CORRECTION	An error has been made?
I SAY AGAIN	I repeat (e.g. important information).
I SPELL	Phonetically spelling of the word.
OUT	End of communication.
OVER	I have completed this part of the message and am inviting you to reply.
RECEIVED	Receipt acknowledgement.
SAY AGAIN	Repeat your message.
STATION CALLING	Used when a station is uncertain of the identity of a station which is calling.

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