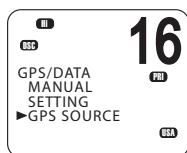


Selecting the GPS source

A valid GPS connection is required for DSC to function. The RS90S radio can use either its internal GPS system or an external GPS source.

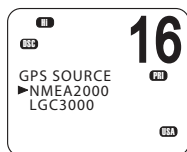
The internal GPS system requires an external GPS antenna to be installed. Installation instructions can be found in the RS90S Installation Manual.

External GPS sources can be derived from either NMEA 0183 or NMEA 2000 protocol to receive GPS data from a compatible GPS unit. Up to 4 sources can be connected.



1. Select GPS/DATA →GPS SOURCE.
2. Select the required GPS source, and then press [OK].

→ **Note:** NMEA 2000 SOURCE options will appear only if an NMEA 2000 network is connected to the radio and is operational.



Data / Source

LEVEL-2	LEVEL-3	Function	Options
GPS	SETTING	TIME OFFSET	+00:00
		TIME FORMAT	12 HR/24 HR
		TIME DISPLY	ON/OFF
		LL DISPLY	ON/OFF
		COG/SOG	ON/OFF
		GPS ALERT	ON/OFF
	GPS SOURCE	MANUAL	SET LAT / LON / TIME
		NMEA 2000	AUTO SELECT
			N2K-1
			N2K-2 etc. ...
		NMEA 0183	Set checksum (ON/OFF)
		INTERNAL GPS	Select
	GPS SIM	Set GPS simulator mode	ON/OFF
DEPTH	NONE		
	...		

DSC Setup

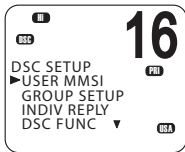
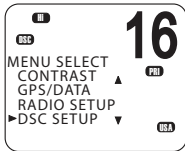
Entering or viewing your individual MMSI

The user MMSI (Marine Mobile Service Identity) is a unique 9 digit number, similar to a personal telephone number. It is used on marine transceivers that are capable of using the DSC system.

Contact the appropriate authorities in your country to obtain your user MMSI.

→ Notes:

- Entering the MMSI is a once-only operation. You can display and read your user MMSI at any time, but you can only enter it once.
- Enter the number carefully before pressing [OK] the second time. If you make a mistake, the radio will have to be sent back to the dealer to be reset.
- Your MMSI is also shown on the startup screen when you power on the transceiver.



1. Select MENU → DSC SETUP → USER MMSI.

If you have already entered your MMSI, it will be shown on screen.

If you are entering your MMSI, a dashed line appears.

2. Enter your MMSI along the dashed line, one number at a time.
3. Press [OK] to store your user MMSI.
4. Enter your user MMSI again as a password check, then press [OK] to permanently store the user MMSI.

Introduction to group MMSI

A group MMSI is a shared MMSI. When a DSC call is transmitted by one of the vessels in the group, all the radios that have the same MMSI entered will receive the message.

The RS90S radio can store up to 20 group MMSIs. In other words, you can be in 20 different groups.

A group MMSI always starts with 0.

For information on sending a DSC group call, see "Sending a group call" on page 48.

Creating a group MMSI

1. Select MENU → DSC SETUP → GROUP SETUP.

2. Select MANUAL NEW.

If this is the first time that you are entering a group name, a dashed line appears.

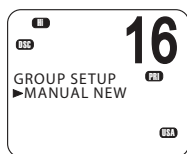
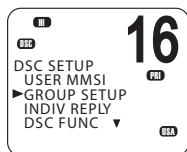
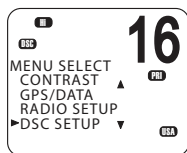
3. Enter the group name along the dashed line. It can be a maximum of 11 alphanumeric characters.

4. Press [OK] repeatedly if necessary to reach the MMSI line.

5. Enter the group MMSI. The first number is always a 0.

6. Press [OK] repeatedly until STORE/CANCEL is displayed.

7. Select STORE or CANCEL as required.



Editing or deleting a group MMSI

1. Select MENU → DSC SETUP → GROUP SETUP.

The display shows the list of existing group names.

2. Scroll to the group you want to edit and press [OK].

- To delete the group, select DELETE then YES. The group will be deleted immediately.
- To edit the group, select EDIT.

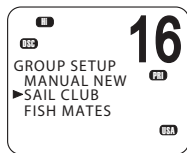
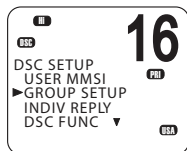
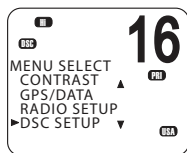
3. Edit the group name as required.

4. Press [OK] repeatedly if necessary until the cursor moves to the MMSI line.

5. Edit the MMSI. (Note that the first number is always a 0.)

6. Press [OK] repeatedly until STORE/CANCEL is displayed.

7. Scroll to STORE or CANCEL as required and press [OK].



Entering or checking your ATIS MMSI

EU models only.

The ATIS MMSI is a special MMSI that is used on inland waterways in Europe for identifying the ship or vessel that made a VHF radio transmission. The MMSI is transmitted on the VHF channel each time the radio operator finishes talking and releases the PTT key. For further information, see “ATIS” on page 62.

→ Notes:

- You can display and read your ATIS MMSI at any time, but you can only enter it once.
- Enter the number carefully before pressing [OK] the second time. If you make a mistake, the radio will have to be sent back to the dealer to be reset.

1. Select MENU → DSC SETUP → ATIS MMSI.

If you have already entered your ATIS MMSI, it is shown on screen.

If you are entering a new ATIS MMSI, a dashed line appears.

2. Enter your ATIS MMSI along the dashed line, one number at a time. An ATIS MMSI always starts with the number 9.
3. Press [OK].
4. Enter your ATIS MMSI again as a password check, then press [OK] to permanently store the ATIS MMSI.

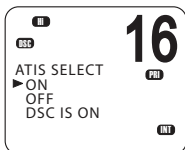
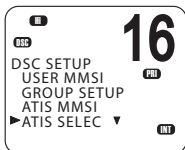
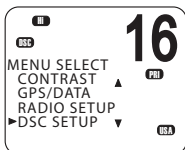
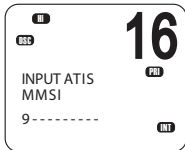
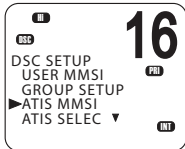
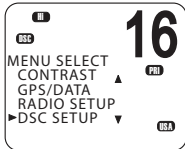
Enabling ATIS functionality

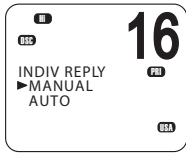
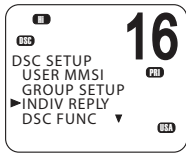
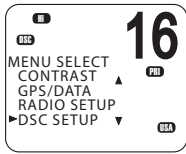
EU models only.

1. Select MENU → DSC SETUP → ATIS SELECT.
2. Scroll to ON or OFF as required and press [OK].

→ Notes:

- Before you can enable ATIS, you must enter an ATIS MMSI. See “Entering or checking your ATIS MMSI” above.
- Before you can enable ATIS, DSC must be turned off. See “Enabling DSC functionality” on page 98.
- When ATIS is enabled, the ATIS icon is displayed on screen.
- In some European countries, SCAN functionality is limited, and, if ATIS is enabled, the 3CH SCAN mode will be disabled.



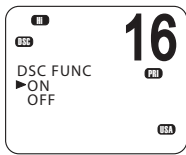
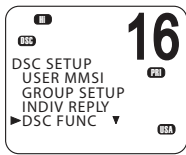
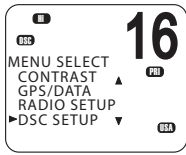


Individual DSC call - reply options

The reply to an incoming DSC individual call can be automatic or manual.

- An automatic reply sends an acknowledgement and then sets the requested working channel, ready for a conversation.
 - A manual reply prompts you to acknowledge the call.
1. Select MENU → DSC SETUP → INDIV REPLY.
 2. Scroll to MANUAL or AUTO as required and press [OK].

For information on receiving an individual DSC call, see “Receiving a DSC individual call” on page 59.



Enabling DSC functionality



Warning: DSC is an important safety function; disabling it is not recommended.

DSC is only available after a valid USER MMSI has been entered. For instructions on entering your MMSI, see “Entering or viewing your individual MMSI” on page 95.

1. Select MENU → DSC SETUP → DSC FUNC.
2. Scroll to ON or OFF as required and press [OK]

→ Notes:

- It is not possible to have both ATIS and DSC on at the same time. If you want to enable DSC, you must first switch ATIS off.
- When DSC functionality is selected, the **DSC** icon is displayed on screen.

LL polling calls - reply options

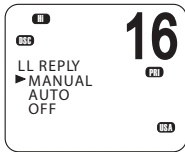
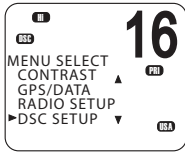
A DSC LL polling call is received by the radio when one of your buddies sends a request for your position—latitude and longitude request (LL request)—normally at regular intervals.

For information on LL requests (polling) see “Sending an LL request for the position of a buddy” on page 52.

You can set up the radio to respond to an LL polling request in one of three ways:

- **MANUAL**
Reply manually to any incoming LL polling requests.
- **AUTO**
Automatically reply to any incoming LL polling requests.
- **OFF**
Ignore all incoming LL polling requests.

1. Select MENU → DSC SETUP → LL REPLY.
2. Scroll to MANUAL, AUTO or OFF as required and press [OK].



Automatic channel switch options

When a DSC call is received, it may include a request to change to a specific channel for subsequent communications.

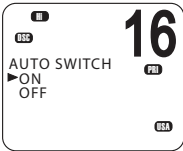
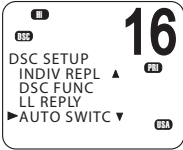
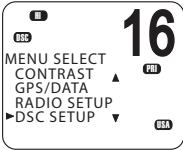
With Auto Switch set to ON, when receiving a DSC call, the radio will automatically switch to the requested channel if not cancelled within 10 seconds. This might disrupt important communications that are already in progress on the current working channel. To avoid this, you can prevent the radio from automatically switching channel by setting the AUTO SWITCH feature to OFF.

If Auto Switch is set to OFF, the  icon will be displayed on screen to remind you that this feature is set to off.

Additionally, the text “AUTO SW OFF” will be included in an All Ships or Group call.

To enable or disable automatic channel switching:

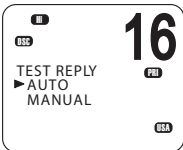
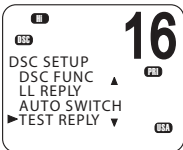
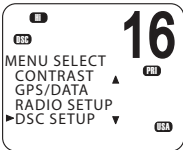
1. Select MENU → DSC SETUP → AUTO SWITCH.
2. Scroll to ON or OFF as required and press [OK].



Setting up DSC test reply

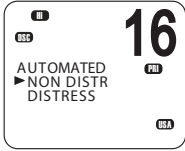
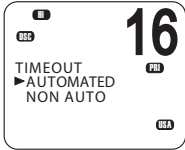
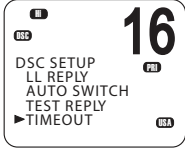
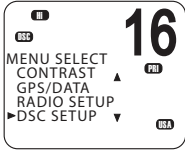
You can set up the radio to respond to incoming DSC TEST calls with an automatic or manual response.

1. Select MENU → DSC SETUP → TEST REPLY.
2. Scroll to AUTO or MANUAL as required and press [OK].



- **AUTO**
On receiving a DSC TEST call, waits for 10 seconds, and then automatically acknowledges the call.
- **MANUAL**
On receiving a DSC TEST call, requires you to press the [ACK] soft key to acknowledge the call.

For information on receiving a DSC test call, see “Receiving a DSC test call” on page 61.



Setting up the DSC inactivity timer

The inactivity timer causes the radio to automatically exit a procedure after a specified period of inactivity.

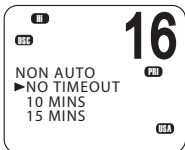
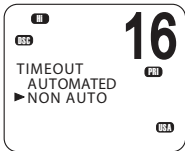
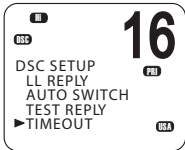
AUTOMATED

You can set the radio to exit any automated procedure after a period of non-activity.

There are two categories:

- DISTRESS options: NO TIMEOUT, 5 MINS, or 10 MINS
- NON-DISTR options: NO TIMEOUT, 10 MINS, or 15 MINS

1. Select MENU → DSC SETUP → TIMEOUT → AUTOMATED.
2. Select NON DISTRESS or DISTRESS.
3. Scroll to the required timeout period, and then press [OK]



NON AUTO

You can set the radio to exit any non-automated procedure after a period of non-activity.


1. Select MENU → DSC SETUP → TIMEOUT → NON AUTO.
2. Scroll to the timeout period: NO TIMEOUT, 10 MINS or 15 MINS, then press [OK]

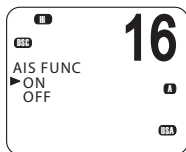
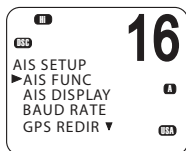
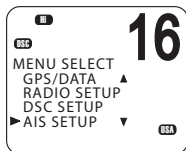
AIS Setup

→ **Note:** The wired HS has a shortcut key to access AIS SETUP (Shift 2).

Enabling AIS functionality

1. Select MENU → AIS SETUP → AIS FUNC.
2. Scroll to ON or OFF as required and press [OK].

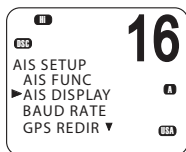
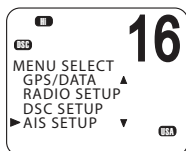
→ **Note:** When AIS functionality is enabled, the  icon is shown on screen.



Setting up AIS display format

When viewing the PPI screen, AIS targets can be displayed with the vessel's name or MMSI.

1. Select MENU → AIS SETUP → AIS DISPLAY.
2. Scroll to SHIP MMSI or SHIP NAME as required and press [OK].

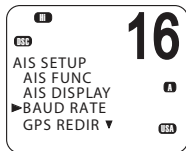
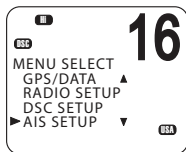


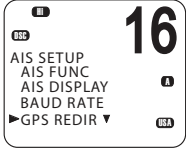
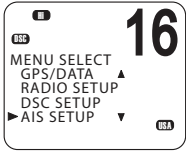
Setting up AIS baud rate

AIS data can be output to a compatible chart plotter, multi-function device (MFD) or PC via the NMEA port.

The NMEA port baud rate can be set to 4800 or 38400. The default setting is 38400. If 4800 is selected, a warning that data may be lost will be displayed.

1. Select MENU → AIS SETUP → BAUD RATE.
2. Scroll to 4800 or 38400 as required and press [OK].

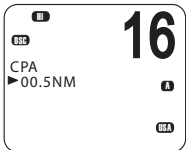
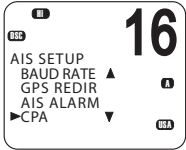
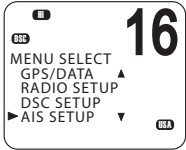




GPS REDIR

GPS redirection option set to output the GPS information to the chart plotter, eliminating the need for an additional multiplexer.

1. Select MENU → AIS SETUP → GPS REDIR.
 2. Scroll to YES or NO as required and press [OK].
 - If you select YES, the string \$RMC will be redirected to the chart plotter once it is received.
- **Note:** The REDIR function will only redirect RMC and GLL messages from NMEA 0183 input port to the AIS output port.



Setting up the CPA distance

Closest point of approach (CPA) is the calculated closest distance between you and a target vessel based on the current speed and course.

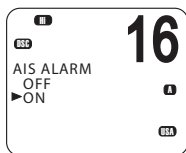
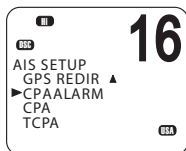
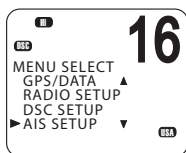
If the radio detects that a target vessel will come closer than the set distance and within the set T/CPA time, the CPA alarm will sound a two-tone alert.

1. Select MENU → AIS SETUP → CPA.
 2. Use the ▲ and ▼ keys to raise or lower the CPA distance limit.
 3. Press [OK].
- **Note:** The CPA distance is always in nautical miles.

Enabling the CPA alarm

You can enable or disable the CPA alarm.

1. Select MENU → AIS SETUP → CPA ALARM.
2. Scroll to ON or OFF as required, and then press [OK].

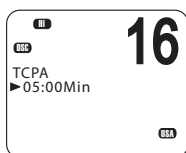
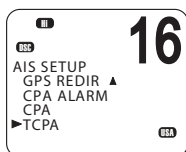
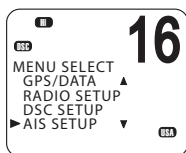


Setting up the T/CPA time

Time to closest point of approach (T/CPA) is the calculated time for a target vessel to arrive at the closest point of approach based on the current speed and course.

If the radio detects that a vessel will arrive at the closest point of approach within the set time and the CPA distance, the CPA alarm will sound a two-tone alert.

1. Select MENU → AIS SETUP → TCPA.
2. Use the ▲ and ▼ keys to raise or lower the T/CPA time limit.
3. Press [OK].



GPS setup

If a GPS receiver is connected to the NMEA port of the RS90S, the radio will automatically receive the vessel's position and local time from the GPS.

If GPS data is not available for some reason, the radio will sound the NO GPS alert for 2 minutes (or until you press any key).

If the GPS data becomes older than 4 hours, the NO GPS alert will sound, and it can only be silenced manually or by the reception or manual entry of new GPS data.

If the vessel's GPS data is older than 23.5 hours, the data will be erased and the NO GPS alert will sound.

Manually entering position and UTC time

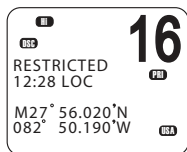
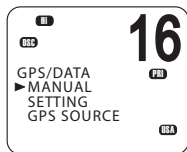
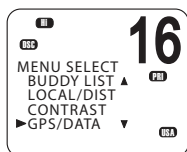
→ **Note:** this function is only shown when there is no GPS receiver connected.

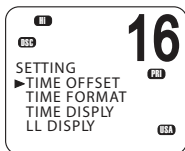
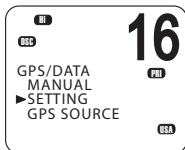
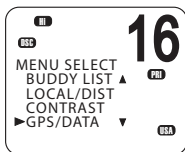
1. Select MENU → GPS/DATA → MANUAL.
2. Enter the latitude, then the longitude, then the UTC.

When you have finished, the latitude, longitude and UTC time will be shown on the standby screen. The prefix M indicates a manual entry.

→ **Notes:**

- Manual entries are cancelled if a real GPS position is received.
- A warning will be displayed after 4 hours to remind you that the current position information was manually entered.





Setting up local time offset

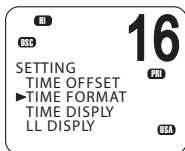
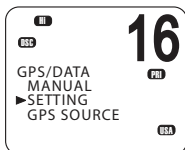
If your position and time data are being updated through a GPS receiver, you can enter the time difference between UTC and local time. Then the local time will be displayed on the screen.

1. Select MENU → GPS/DATA → SETTING → TIME OFFSET
 2. Enter the difference between UTC and local time.
You can set in quarter-hour increments up to a maximum offset of ± 13 hours.
- **Note:** When local time is being displayed, LOC is displayed after the time on the standby screen.

Time format options

Time can be shown in 12 or 24 hour format.

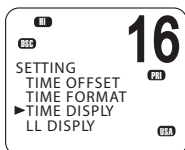
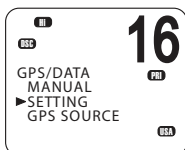
1. Select MENU → GPS/DATA → SETTING → TIME FORMAT.
 2. Select 12- or 24-hour as required.
- **Note:** When the 12-hour format has been selected, the time is displayed with an AM or PM suffix.



Time display options

You can toggle on or off the time display on the handset screens.

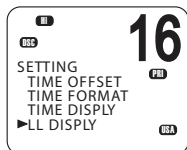
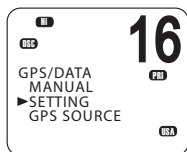
3. Select MENU → GPS/DATA → SETTING → TIME DISPLY.
4. Select ON or OFF as required.



Position display options

You can display or hide your vessel's position on screen.

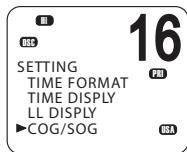
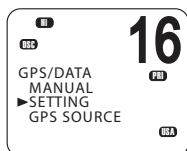
1. Select MENU → GPS/DATA → SETTING → LL DISPLY.
2. Select ON or OFF as required.



Course and speed display options

If position and time are being updated through a GPS navigation receiver, you can display or hide your course over ground (COG) and speed over ground (SOG) data on screen.

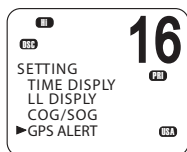
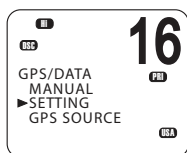
1. Select MENU → GPS/DATA → SETTING → COG/SOG.
2. Select ON or OFF as required.



GPS alert options

If the GPS Alert setting is ON and no GPS signal is received for a period of 10 minutes, the alarm will sound for 2 minutes.

1. Select MENU → GPS/DATA → SETTING → GPS ALERT.
 2. Select ON or OFF as required.
- **Note:** The default setting is ON for the RS90S EU and OFF for the RS90S US.



General setup

Radio sensitivity

LOCAL/DIST allows you to set the sensitivity of the radio as follows:

- LOCAL
Recommended for use in areas of high radio noise; for example, close to cities. It is not recommended for open sea conditions. Local is displayed on the handset screen.
- DISTANT
Recommended for open sea conditions.

1. Select MENU → LOCAL/DIST.
 2. Scroll to DISTANT or LOCAL as required.
 3. Press [OK].
- **Note:** See also “Adjusting squelch” on page 22.

Display contrast level

Select MENU → CONTRAST.

1. Use the ▲ or ▼ keys to raise or lower the contrast.
2. Press [OK] to accept the setting.

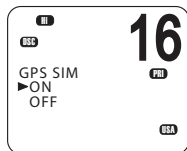
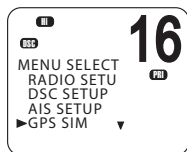
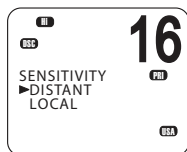
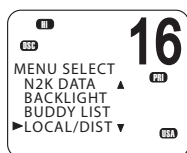
GPS simulator

The GPS simulator creates GPS data for test purposes.

1. Select MENU → GPS SIM.
2. Select ON or OFF as required.

→ **Notes:**

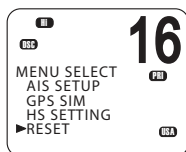
- The GPS simulator is set to OFF whenever the radio is turned on or whenever real GPS data is available through the COM port.
- The radio will be blocked from sending DSC calls while the GPS simulator is on.



Reset to factory defaults

This option returns every setting in the RS90S to factory default values.

However, MMSI settings and entries in your buddy list are preserved.



1. Select MENU → RESET.
2. Select YES to confirm and reset the radio, or NO to exit without resetting.



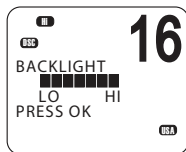
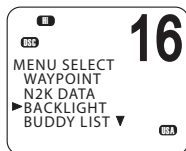
Backlight level

This option sets the brightness of the LCD screen and keypad.

1. Select MENU → BACKLIGHT → LEVEL.
2. Use the ▲ and ▼ keys to set the level required.
3. Press [OK] to enable the setting and return to the menu.

→ Notes:

- The DISTRESS key backlight cannot be turned down.
- If the backlight setting is set to level 0 (off), the backlight will automatically turn ON at level 1 if the radio detects any DSC activity, or any buttons are pressed. The backlight will return to level 0 (off) after 10 seconds of inactivity.



9

Appendices

Appendix 1 - Troubleshooting

1. The radio will not power up.

A fuse may have blown or there is no voltage getting to the transceiver.

Check the power cable for cuts, breaks, or squashed sections.

After checking the wiring, replace the 10 Amp fuse.

Check the battery voltage. This must be at least 10.5V.
2. The transceiver blows the fuse when the power is switched on.

The power wires may have been reversed.

Check that the red wire is connected to the positive battery terminal, and the black wire is connected to the negative battery terminal.
3. The speaker makes popping or whining noises when the vessel's engine is running.

Electrical noise may be interfering with the transceiver.

Re-route the power cables away from the engine.

Add a noise suppressor to the power cable.

Use resistive spark plug wires and/or use an alternator whine filter.
4. No sound from the external speaker.

Check that the external speaker is enabled in Setup. See "External speaker" on page 90.

Check that the external speaker cable is physically connected.

Check the soldering of the external speaker cable.
5. Transmissions are always on low power, even when high (Hi) power is selected.

The antenna may be faulty.

Test the transceiver with a different antenna.

Have the antenna checked out.

6. Battery symbol is displayed.

The power supply is too low.

Check the battery voltage. This should be at least 10.5 V ± 0.5 V DC.

Check the alternator on the vessel.

7. GPS alarm sounds and LCD shows: Please check GPS link! The NO GPS symbol is shown.

GPS data has been lost. This sequence will repeat every 4 hours until GPS data from an operational GPS receiver is available. The GPS cable may faulty or the GPS setting may be incorrect:

Check that the GPS cable is physically connected.

Check the polarity of the GPS cable.

Check the baud rate setting of the GPS if applicable. The baud rate setting should be 4800. Parity should be set to NONE.

Appendix 2 - Keys reference

Key	Reference
VOL	The volume control is on the side of RS90S handset. This key also adjusts the volume of an external speaker, if connected.
16/9	Press [16/9] to immediately switch to the priority channel. Press again to return to your original channel. The default Priority Channel is CH16. In the USA, you can toggle between Channel 16 and Channel 9 as the priority channel. Hold down [16/9] until a beep sounds and the required priority channel is displayed.
DISTRESS	The red [DISTRESS] key on top of the handset sends a DSC distress call. DSC must be switched on and an MMSI must have been entered into the radio. For more information, see "Introduction to DSC" on page 40.
PTT	The Push to Talk (PTT) key enables the microphone and transmits your voice over the selected channel, see "PTT Key" on page 23.
OK	This key has multiple functions depending on the operation you are doing: Sets the high/low transmission power. The Hi or Lo icon on the display changes. In menus, press to confirm the selection.
▲ and ▼	Used for changing channel and for scrolling through menu options.
◀ and ▶	Used for adjusting squelch and moving the cursor when entering data on a wired handset.

X - Exit	When navigating menus, use [X] to clear incorrect entries, exit from a menu without saving changes, or go back to the previous screen.
CALL/ MENU	Short press to enter the DSC CALL menu and make DSC calls. See “Introduction to DSC” on page 40. Long press and hold to display the main menu. See “Using the menus” on page 23.
WX	<u>US models</u> In USA and Canadian waters, short press [WX] to hear the most recently selected weather station. For further information, see “Receiving weather alerts (US model only)” on page 27. <u>For all other models</u> The [WX] key can be programmed to a channel of your choice. For further information see “Favourite channel (non-US models)” on page 28.
NAV	Hold down for about 1 second to enter Navigation mode, which displays information about a destination waypoint on the standby screen, see “Navigating to a waypoint” on page 38.
3CH	Press to toggle between your three favourite channels, see page 29. Also used to zoom in the PPI screen, see page 64.
SCAN	See “Scanning channels” on page 29. The SCAN key is also used as the button for a softkey in DSC mode, see “Softkeys” on page 41. Also used to zoom out the PPI screen, see page 64.
AIS	Press to enter AIS mode. For AIS functionality, see “AIS procedures” on page 63. For AIS setup, see “AIS Setup” on page 102.
IC	Hold down [AIS/IC] until the Hailer menu appears, see “Using the intercom” on page 34.

Alphanumeric keys are used for entering numbers and names. (Wired handset only).

Appendix 3 - Beep tones and call alerts

Name	Description
Error	2 short beeps
Acknowledge	1 long beep
Alarm	Two-tone ring; repeated for 2 minutes or until any key is pressed
LL position call alert	Friendly 5-tone ring sequence; press [SILENC] to cancel
WX alert/SAME alert	Ear-catching multi-tone sequence
ROUTINE call alert	Friendly 5-tone ring sequence; press [SILENC] to cancel
URGENCY call alert	Two-tone ring; repeated for 2 minutes or until [SILENC] pressed
SAFETY call alert	Two-tone ring; repeated for 2 minutes or until [SILENC] pressed
DISTRESS call alert	Two-tone ring; repeated for 2 minutes or until [SILENC] pressed

Appendix 4 - Warning Messages

Warning	Message
<i>GPS DATA LOST!!</i>	The GPS signal has been lost. The connection may be broken.
<i>DSC FUNCTION DISABLED ENABLE IN SETUP</i>	The DSC function is disabled. For further information, see “Enabling DSC functionality” on page 98.
<i>ATIS MODE DISABLE SCAN</i>	Scan is automatically disabled in ATIS mode. For further information, see “ATIS” on page 62
<i>EXCESSIVE VOLTAGE!!!</i>	This warning will be displayed if the input voltage to the transceiver exceeds 16 V.

Appendix 5 - AIS information

There are several types of AIS devices as follows:

Class A transceivers

Class A transceivers are similar to class B transceivers, but they are designed to be fitted on large vessels such as cargo ships and large passenger vessels. Class A transceivers transmit at a higher VHF signal power than class B transceivers and therefore can be received by more distant vessels, and also transmit more frequently. Class A transceivers are mandatory on all vessels over 300 gross tonnes on international voyages and certain types of passenger vessels under the international Safety of Life at Sea (SOLAS) regulations.

Class B transceivers

Similar to class A transceivers in many ways, but are normally lower cost due to the less stringent performance requirements. Class B transceivers transmit at a lower power and at a lower reporting rate than class A transceivers.

AIS transceivers

AIS transceivers are used by Vessel Traffic Systems to monitor and control the transmissions of AIS transceivers.

Aids to Navigation (AtoN) transceivers

AtoN transceivers are mounted on buoys or other hazards to shipping in order to transmit details of their location to the surrounding vessels.

The RS90S VHF radio includes an AIS receiver-only function.

AIS Static and dynamic information

Defined transmit rates for Class A vessels shown below are provided for reference purposes only. The frequency of messages received vary due to a number of factors including but not limited to such factors as antenna height, gain and signal interference.

Static information is either broadcast every 6 minutes, when data has been amended, or upon request.

Dynamic information is broadcast depending on speed and course alteration based on the following tables:

Ship's dynamic conditions	Normal reporting interval
At anchor or moored	3 Minutes
0-14 knots	10 Seconds
0-14 knots and changing course	3 1/3 Seconds
14-23 knots	6 Seconds
14-23 knots and changing course	2 Seconds
Ship faster than 23 knots	2 Seconds
Ship faster than 23 knots and changing course	2 Seconds
Platform's condition	Normal reporting interval
Class B Shipborne mobile equipment not moving faster than 2 Knots	3 Minutes
Class B Shipborne mobile equipment moving 2-14 Knots	30 Seconds
Class B Shipborne mobile equipment moving 14-23 Knots	15 Seconds
Class B Shipborne mobile equipment moving faster than 23 Knots	5 Seconds
Search and Rescue aircraft (airborne mobile equipment)	10 Seconds
Aids to Navigation	3 Minutes
AIS transceiver	10 Seconds

Source of information for above table 1-1, 1-2: (ITU recommendations technical document: ITU-R M.1371-1)

Appendix 6 - Technical specification

General

Standard operation temperature	-20°C to +55°C (-4°F to 131°F)
Normal working voltage	12 VDC (10.8 to 15.6 VDC) battery system (negative ground)
Low battery detect voltage	10.5 V
Rx current drain at max audio power	≤1.5 A (one station only)
	Stand-by ≤0.35 A
	Hailer power ≤4 A
Tx current drain	Hi power ≤6 A (@13.6 VDC)
	Lo power ≤1.5 A (@13.6 VDC)
Dimensions	211.2 x 195.7 x 65.0 mm
Weight of transceiver	1.55 kg
VHF frequency range	Transmit 156.025 to 157.425 MHz (default)
	Receive 156.025 to 163.275 MHz (default)
Modulation	FM (16K0G3E) DSC (16K0G2B)
Usable channels	International, USA, Canada, Weather (country specific)
Channel spacing	25 KHz
Frequency stability	±5 PPM
Digital Selectivity Calling (DSC)	Class-D (EN301025) with dual receiver (individual CH70)
DSC standards	ITU-R M.493-13 (US models), EN 300-338-3 (EU models)
AIS standards	ITU-R M.1371-4
Other standards	EN 60950-1:2006 /A1:2010
LCD display	128 x 256 pixel LCD FSTN – 1.3" x 2.6"
Contrast control	Yes
Dimming control	Yes; can be dimmed to no backlight
Antenna connector	SO-239 (50 ohm)
NMEA 2000 connector	Micro-C (5 pin)
Waterproof	JIS-7 (totally submersible)
Compass safe distance	0.5 m (1.5')

Receiver

Intermediate frequency	1st 21.4 MHz
	2nd 450 KHz
Sensitivity	12dB SINAD dBuV \leq -6 BuV
Squelch sensitivity	\leq -4 dBuV
Spurious response rejection ratio	\geq 70 dB
Adjacent channel selectivity	\geq 70 dB
Intermodulation response	\geq 68 dB
S/N at 3KHz deviation	\geq 40 dB
Audio output power at THD 10%	5W (external speaker output)
	0.5 W handset
Audio distortion	\leq 5%
Audio response	+1 to -3 dB of 6 dB/octave from 300 Hz to 3 kHz

Transmitter

Frequency error	\pm 5 PPM
RF power	Hi: 23 ± 2 W
	Lo: 0.8 ± 0.2 W
Maximum deviation	± 5 KHz
S/N at 3 KHz deviation	40 dB
Modulation distortion \pm 3 KHz	\leq 5%
Audio response at 1KHz deviation	+1 to -3 dB of 6 dB/octave from 300 Hz to 3 kHz
Spurious/harmonic emissions	Hi/Lo <0.25 uW
Modulation sensitivity	\leq 20 mV
Transmitter protection	Open/short circuit of antenna

Communications

Comm. port NMEA 0183	NMEA 0183, 4800 baud
Comm. port NMEA 2000	NMEA 2000
NMEA 0183 input (receive)	RMC, GGA, GLL, GNS
NMEA 0183 output (transmit)	DSC (for DSC call), DSE (for enhanced position). AIVDM (AIS) 38400 Baud

Hailer

Audio power out	30 W @ 4 Ohms
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AIS

AIS function	Dual receivers only
Receiver frequency	CH87 - 161.975 MHz
	CH88 - 162.025 MHz (default channel)
Supported AIS Information	Status/Destination/ETA, Vessel Name, Type of vessel, Call sign, MMSI number, IMO number, Draft/Size of vessel, Vessel position, SOG/COG/Rate of turn/Heading

HS90 wireless handset

Rx Frequency	2401~2480 MHz
Rx channel number	80
Rx Sensitivity @ PER <=1%	-92 dBm
Rx current	<60 mA
Nominal transmit power/peak power	18+/-2 dBm
Tx frequency error	<+/-30 ppm
Tx current	<150 mA
Functional range	200 m
HS90 cradle voltage	12 VDC battery system (negative ground)
HS90 cradle current drain	≤0.5 A
Handset battery	Lithium Polymer, 7.4 V, 1500 mAh (11.1 Wh)
Handset charging method	Inductive charging built into cradle

Built-in GPS receiver

Receiving frequency	1575.42 MHz
Tracking code	C/A code
Number of channels	72 channels
Horizontal accuracy	<10 m
Position fixing time	Warm start: 30s / Cold start: 90s
Position update interval	1 second typical

→ **Note:** Specifications are subject to change without notice.

RS90S NMEA 2000 PGNS

- 126992 System Time
- 127250 Vessel Heading
- 127258 Magnetic Variation
- 129025 Position, Rapid Update
- 129026 COG & SOG, Rapid Update
- 129029 GNSS Position Data
- 129033 Time & Date
- 129038 Class A position report (Rx,Tx)
- 129039 Class B position report (Rx,Tx)
- 129040 Class B extended position report (Rx, Tx)
- 129041 AIS Aids to Navigation (AtoN) Report
- 129283 Cross Track Error
- 129284 Navigation Data
- 129285 Navigation Route/WP Information
- 129539 GNSS DOPs
- 129540 GNSS Sats in View
- 129792 DGNSB Broadcast binary message (Tx)
- 129793 UTC and date report (Tx)
- 129794 Class A static and voyage related data (rx, tx)
- 129795 Addressed binary message (tx)
- 129796 Acknowledge (tx)
- 129797 Binary broadcast message (tx)
- 129798 SAR Aircraft Position report (tx)
- 129799 Radio Frequency/Mode/Power
- 129800 UTC/Date enquiry (tx)
- 129801 Addressed safety msg (rx,tx)
- 129802 Broadcast safety msg (rx,tx)
- 129803 Interrogation (tx)
- 129804 Assignment Mode Command (tx)
- 129805 Data Link Management message (tx)
- 129807 AIS Group Assignment
- 129808 DSC Call Information
- 129809 AIS Class B "CS" Static Data Report, Part A
- 129810 AIS Class B "CS" Static Data Report, Part B
- 130074 Route and WP Service - WP List - WP Name & Position
- 130840 Source Selection
- 130842 AIS and VHF Messages (Simrad Proprietary for AIS Class B 'CS')
- 130850 Event Command

Appendix 7 - Channel charts

The following channel charts are provided for reference only and may not be correct for all regions. It is the operator's responsibility to ensure correct channels and frequencies are used for local regulations.

EU and INTERNATIONAL channel chart

The following is a table of transmitting frequencies in the VHF maritime mobile band.

- **Note:** For assistance in understanding the Table, see Notes a) to zz) below. (WRC-15)
- **Note:** The Table below defines the channel numbering for maritime VHF communications based on 25 kHz channel spacing and use of several duplex channels. The channel numbering and the conversion of two-frequency channels for single-frequency operation shall be in accordance with Recommendation ITU-R M.1084-5 Annex 4, Tables 1 and 3. The Table below also describes the harmonized channels where the digital technologies defined in the most recent version of Recommendation ITU-R M.1842 could be deployed. (WRC-15)

Channel designator	Transmitting frequencies (MHz)					
	From ship stations	From coast stations	S/D/R	Channel name	Restriction	Notes
01	156.050	160.650	D	TELEPHONE		m)
02	156.100	160.700	D	TELEPHONE		m)
03	156.150	160.750	D	TELEPHONE		m)
04	156.200	160.800	D	PORT OPS		m)
05	156.250	160.850	D	PORT OPS/VTS		m)
06	156.300	156.300	S	SAFETY		f)
07	156.350	160.950	D	PORT OPS		m)
08	156.400	156.400	S	COMMERCIAL		
09	156.450	156.450	S	CALLING		i)
10	156.500	156.500	S	COMMERCIAL		h), q)
11	156.550	156.550	S	VTS		q)
12	156.600	156.600	S	PORT OPS/VTS		
13	156.650	156.650	S	BRIDGE COM		k)
14	156.700	156.700	S	PORT OPS/VTS		
15	156.750	156.750	S	PORT OPS	1W	g)
16	156.800	156.800	S	DISTRESS		f)
17	156.850	156.850	S	SAR	1W	g)

18	156.900	161.500	D	PORT OPS		m)
19	156.950	161.550	D	SHIP-SHORE		t), u), v)
20	157.000	161.600	D	PORT OPS		t), u), v)
21	157.050	161.650	D	PORT OPS		w), y)
22	157.100	161.700	D	PORT OPS		w), y)
23	157.150	161.750	D	TELEPHONE		w), x), y)
24	157.200	161.800	D	TELEPHONE		w), ww), x), y)
25	157.250	161.850	D	TELEPHONE		w), ww), x), y)
26	157.300	161.900	D	TELEPHONE		w), ww), x), y)
27	157.350	161.950	D	TELEPHONE		z)
28	157.400	162.000	D	TELEPHONE		z)
60	156.025	160.625	D	TELEPHONE		m)
61	156.075	160.675	D	PORT OPS		m)
62	156.125	160.725	D	PORT OPS		m)
63	156.175	160.775	D	PORT OPS		m)
64	156.225	160.825	D	TELEPHONE		m)
65	156.275	160.875	D	PORT OPS		m)
66	156.325	160.925	D	PORT OPS		m)
67	156.375	156.375	S	BRIDGE COM		h)
68	156.425	156.425	S	SHIP-SHIP		
69	156.475	156.475	S	PORT OPS		
71	156.575	156.575	S	PORT OPS		
72	156.625	156.625	S	SHIP-SHIP		i)
73	156.675	156.675	S	PORT OPS		h), i)
74	156.725	156.725	S	PORT OPS		
75	156.775	156.775	S	PORT OPS	1W	n), s)
76	156.825	156.825	S	SHIP-SHIP	1W	n), s)
77	156.875	156.875	S	SHIP-SHIP		
78	156.925	161.525	D	SHIP-SHORE		t), u), v)
79	156.975	161.575	D	PORT OPS		t), u), v)
80	157.025	161.625	D	PORT OPS		w), y)
81	157.075	161.675	D	TELEPHONE		w), y)
82	157.125	161.725	D	TELEPHONE		w), x), y)
83	157.175	161.775	D	TELEPHONE		w), x), y)
84	157.225	161.825	D	TELEPHONE		w), ww), x), y)
85	157.275	161.875	D	TELEPHONE		w), ww), x), y)
86	157.325	161.925	D	TELEPHONE		w), ww), x), y)
87	157.375	157.375	S	TELEPHONE		z)
88	157.425	157.425	S	TELEPHONE		z)
1019	156.950	156.950	S	TELEPHONE		
1020	157.000	157.000	S	TELEPHONE		
1078	156.925	156.925	S	TELEPHONE		
1079	156.975	156.975	S	TELEPHONE		
2006	160.900	160.900	S	TELEPHONE		r)
2019	161.550	161.550	S	TELEPHONE		

2020	161.600	161.600	S	TELEPHONE		
2078	161.525	161.525	S	TELEPHONE		
2079	161.575	161.575	S	TELEPHONE		

Editorial note: The note numbering below is provisional and will be aligned during final preparations of the new edition of the Radio Regulations.

Notes referring to the Table

General notes:

- a) Administrations may designate frequencies in the inter-ship, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations under the conditions specified in Nos. **51.69, 51.73, 51.74, 51.75, 51.76, 51.77** and **51.78**. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.
- b) The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.
- c) The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may be used for direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations. (WRC-12)
- d) The frequencies in this table may also be used for radio communications on inland waterways in accordance with the conditions specified in No. **5.226**.
- e) Administrations may apply 12.5 kHz channel interleaving on a non-interference basis to 25 kHz channels, in accordance with the most recent version of Recommendation ITU-R M.1084, provided:
 - it shall not affect the 25 kHz channels of the present Appendix maritime mobile distress and safety, automatic identification system (AIS), and data exchange frequencies, especially the channels 06, 13, 15, 16, 17, 70, AIS 1 and AIS 2, nor the technical characteristics set forth in Recommendation ITU-R M.489-2 for those channels;

- implementation of 12.5 kHz channel interleaving and consequential national requirements shall be subject to coordination with affected administrations. (WRC-12)

Specific notes

- f) The frequencies 156.300 MHz (channel 06), 156.525 MHz (channel 70), 156.800 MHz (channel 16), 161.975 MHz (AIS 1) and 162.025 MHz (AIS 2) may also be used by aircraft stations for the purpose of search and rescue operations and other safety-related communication. (WRC-07)
- g) Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters.
- h) Within the European Maritime Area and in Canada, these frequencies (channels 10, 67, 73) may also be used, if so required, 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, under the conditions specified in Nos. **51.69, 51.73, 51.74, 51.75, 51.76, 51.77** and **51.78**.
- i) The preferred first three frequencies for the purpose indicated in Note **a)** are 156.450 MHz (channel 09), 156.625 MHz (channel 72) and 156.675 MHz (channel 73).
- j) Channel 70 is to be used exclusively for digital selective calling for distress, safety and calling.
- k) Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications. It may also be used for the ship movement and port operations service subject to the national regulations of the administrations concerned.
- l) These channels (AIS 1 and AIS 2) are used for an automatic identification system (AIS) capable of providing world wide operation, unless other frequencies are designated on a regional basis for this purpose. Such use should be in accordance with the most recent version of Recommendation ITU-RM.1371. (WRC-07)
- m) These channels may be operated as single frequency channels, subject to coordination with affected administrations. The following conditions apply for single frequency usage:

- The lower frequency portion of these channels may be operated as single frequency channels by ship and coast stations.
- Transmission using the upper frequency portion of these channels is limited to coast stations.
- If permitted by administrations and specified by national regulations, the upper frequency portion of these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, 2027* and 2028*. (WRC-15)

* From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2.

- n) With the exception of AIS, the use of these 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, by limiting the output power to 1W. (WRC-12)
- o) (SUP - WRC-12)
- p) Additionally, AIS 1 and AIS 2 may be used by the mobile-satellite service (Earth-to-space) for the reception of AIS transmissions from ships. (WRC-07)
- q) When using these channels (10 and 11), all precautions should be taken to avoid harmful interference to channel 70. (WRC-07) In the maritime mobile service, this frequency is reserved for experimental use for future applications or systems (e.g. new AIS applications, man over board systems, etc.). If authorized by administrations for experimental use, the operation shall not cause harmful interference to, or claim protection from, stations operating in the fixed and mobile services. (WRC-12)
- r) Channels 75 and 76 are also allocated to the mobile-satellite service (Earth-to-space) for the reception of long-range AIS broadcast messages from ships (Message 27; see the most recent version of Recommendation ITU-RM.1371). (WRC-12)
- w. In Regions 1 and 3:

Until 1 January 2017, the frequency bands 157.200-157.325 MHz and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) may be used for digitally modulated emissions, subject to coordination with affected administrations. Stations using these channels or frequency bands for digitally modulated emissions shall not cause harmful interference to, or claim protection from, other stations operating in accordance with Article 5.

From 1 January 2017, the frequency bands 157.200-157.325 MHz and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) are identified for the utilization of the VHF Data Exchange System (VDES) described in the most recent version of Recommendation ITU-R M.2092. These frequency bands may also be used for analogue modulation described in the most recent version of Recommendation ITU-R M.1084 by an administration that wishes to do so, subject to not causing harmful interference to, or claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations. (WRC-15)

- ww. In Region 2, the frequency bands 157.200-157.325 and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions in accordance with the most recent version of Recommendation ITU-R M.1842.

In Canada and Barbados, from 1 January 2019 the frequency bands 157.200-157.275 and 161.800-161.875 MHz (corresponding to channels: 24, 84, 25 and 85) may be used for digitally modulated emissions, such as those described in the most recent version of Recommendation ITU-R M.2092, subject to coordination with affected administrations. (WRC-15)

- x) From 1 January 2017, in Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Democratic Republic of the Congo, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe, the frequency bands 157.125-157.325 and 161.725-161.925 MHz (corresponding to channels: 82, 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.

From 1 January 2017, in China, the frequency bands 157.150 - 157.325 and 161.750 - 161.925 MHz (corresponding to channels: 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions. (WRC-12)

- y) These channels may be operated as single or duplex frequency channels, subject to coordination with affected administrations. (WRC-12)
- z) Until 1 January 2019, these channels maybe used for possible testing of future AIS applications without causing harmful interference to, or claiming protection from, existing applications and stations operating in the fixed and mobile services.

From 1 January 2019, these channels are each split into two simplex channels. The channels 2027 and 2028 designated as ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092. (WRC-15)

AAA) From 1 January 2019, the channels 24, 84, 25 and 85 may be merged in order to form a unique duplex channel with a bandwidth of 100 kHz in order to operate the VDES terrestrial component described in the most recent version of Recommendation ITU-R M.2092. (WRC-15)

mm) Transmission on these channels is limited to coast stations. If permitted by administrations and specified by national regulations, these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, 2027* and 2028*. (WRC-15)

* From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2.

w1) In Regions 1 and 3:

Until 1 January 2017, the frequency bands 157.025-157.175 MHz and 161.625-161.775 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) may be used for digitally modulated emissions, subject to coordination with affected administrations. Stations using these channels or frequency bands for digitally modulated emissions shall not cause harmful interference to, or claim protection from, other stations operating in accordance with Article 5.

From 1 January 2017, the frequency bands 157.025-157.100 MHz and 161.625-161.700 MHz (corresponding to channels: 80, 21, 81 and 22) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842 using multiple 25 kHz contiguous channels.

From 1 January 2017, the frequency bands 157.150-157.175 MHz and 161.750-161.775 MHz (corresponding to channels: 23 and 83) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842 using two 25 kHz contiguous channels. From 1 January 2017, the frequencies 157.125 MHz and 161.725 MHz (corresponding to channel: 82) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842.

The frequency bands 157.025-157.175 MHz and 161.625-161.775 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) can also be used for analogue modulation described in the most recent version of Recommendation ITU-R M.1084 by an administration that wishes to do so, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations. (WRC-15)

- zx) In the United States, these channels are used for communication between ship stations and coast stations for the purpose of public correspondence. (WRC-15)
- zz) From 1 January 2019, channels 1027, 1028, 87 and 88 are used as single-frequency analogue channels for port operation and ship movement. (WRC-15)

Source: ITU Radio Regulations (2016); reproduced with permission from ITU

USA channel chart

Channel designator	Transmitting frequencies (MHz)		S/D/R	Channel name	Restrictions
	From ship stations	From coast stations			
6	156.300	156.300	S	SAFETY	
8	156.400	156.400	S	COMMERCIAL	
9	156.450	156.450	S	CALLING	
10	156.500	156.500	S	COMMERCIAL	
11	156.550	156.550	S	VTS	
12	156.600	156.600	S	PORT OPS/VTS	
13	156.650	156.650	S	BRIDGE COM	1W
14	156.700	156.700	S	PORT OPS/VTS	
15	--	156.750	R	ENVIRONMENTAL	RX ONLY
16	156.800	156.800	S	DISTRESS	
17	156.850	156.850	S	SAR	1W
20	157.000	161.600	D	PORT OPS	
24	157.200	161.800	D	TELEPHONE	
25	157.250	161.850	D	TELEPHONE	
26	157.300	161.900	D	TELEPHONE	
27	157.350	161.950	D	TELEPHONE	
28	157.400	162.000	D	TELEPHONE	
67	156.375	156.375	S	BRIDGE COM	1W
68	156.425	156.425	S	SHIP-SHIP	
69	156.475	156.475	S	SHIP-SHIP	
71	156.575	156.575	S	SHIP-SHIP	
72	156.625	156.625	S	SHIP-SHIP	
73	156.675	156.675	S	PORT OPS	
74	156.725	156.725	S	PORT OPS	
75	156.775	156.775	S	PORT OPS	1W
76	156.825	156.825	S	PORT OPS	1W
77	156.875	156.875	S	PORT OPS	1W
84	157.225	161.825	D	TELEPHONE	
85	157.275	161.875	D	TELEPHONE	
86	157.325	161.925	D	TELEPHONE	
87	157.375	157.375	S	TELEPHONE	
88	157.425	157.425	S	INTER-SHIP	
1001	156.050	156.050	S	PORT OPS/VTS	
1005	156.250	156.250	S	PORT OPS/VTS	

1007	156.350	156.350	S	COMMERCIAL	
1018	156.900	156.900	S	COMMERCIAL	
1019	156.950	156.950	S	COMMERCIAL	
1020	157.000	157.000	S	PORT OPS	
1021	157.050	157.050	S	US COAST GRD	
1022	157.100	157.100	S	US COAST GRD	
1023	157.150	157.150	S	US COAST GRD	
1063	156.175	156.175	S	PORT OPS/VTS	
1065	156.275	156.275	S	PORT OPS	
1066	156.325	156.325	S	PORT OPS	
1078	156.925	156.925	S	SHIP-SHIP	
1079	156.975	156.975	S	COMMERCIAL	
1080	157.025	157.025	S	COMMERCIAL	
1081	157.075	157.075	S	RESTRICTED	
1082	157.125	157.125	S	RESTRICTED	
1083	157.175	157.175	S	RESTRICTED	

USA weather channels

Channel designator	Transmitting frequencies (MHz)		S/D/R	Channel name	Restrictions
	From ship stations	From coast stations			
WX1	---	162.550	R	NOAA WX1	RX ONLY
WX2	---	162.400	R	NOAA WX2	RX ONLY
WX3	---	162.475	R	NOAA WX3	RX ONLY
WX4	---	162.425	R	NOAA WX4	RX ONLY
WX5	---	162.450	R	NOAA WX5	RX ONLY
WX6	---	162.500	R	NOAA WX6	RX ONLY
WX7	---	162.525	R	NOAA WX7	RX ONLY

CANADA channel chart

Channel designator	Frequencies		S/D/R	Channel Name:	RESTRICTIONS
	MHz (ship)	MHz (coast)			
1	156.050	160.650	D	TELEPHONE	
2	156.100	160.700	D	TELEPHONE	
3	156.150	160.750	D	TELEPHONE	
4	156.200	160.800	D	CANADIAN CG	
5	156.250	160.850	D	TELEPHONE	
6	156.300	156.300	S	SAFETY	
7	156.350	160.950	D	TELEPHONE	
8	156.400	156.400	S	COMMERCIAL	
9	156.450	156.450	S	VTS	
10	156.500	156.500	S	VTS	
11	156.550	156.550	S	VTS	
12	156.600	156.600	S	PORT OPS/VTS	
13	156.650	156.650	S	BRIDGE COM	1W
14	156.700	156.700	S	PORT OPS/VTS	
15	156.750	156.750	S	COMMERCIAL	1W
16	156.800	156.800	S	DISTRESS	
17	156.850	156.850	S	SAR	1W
18	156.900	161.500	D	TELEPHONE	
19	156.950	161.550	D	CANADIAN CG	
20	157.000	161.600	D	CANADIAN CG	1W
21	157.050	161.650	D	CANADIAN CG	
22	157.100	161.700	D	TELEPHONE	
23	157.150	161.750	D	TELEPHONE	
24	157.200	161.800	D	TELEPHONE	
25	157.250	161.850	D	TELEPHONE	
26	157.300	161.900	D	TELEPHONE	
27	157.350	161.950	D	TELEPHONE	
28	157.400	162.000	D	TELEPHONE	
60	156.025	160.625	D	TELEPHONE	
61	156.075	160.675	D	CANADIAN CG	
62	156.125	160.725	D	CANADIAN CG	
63	156.175	160.775	D	TELEPHONE	
64	156.225	160.825	D	TELEPHONE	
65	156.275	160.875	D	TELEPHONE	

66	156.325	160.925	D	TELEPHONE	
67	156.375	156.375	S	COMMERCIAL	
68	156.425	156.425	S	SHIP-SHIP	
69	156.475	156.475	S	COMMERCIAL	
71	156.575	156.575	S	VTS	
72	156.625	156.625	S	SHIP-SHIP	
73	156.675	156.675	S	COMMERCIAL	
74	156.725	156.725	S	VTS	
75	156.775	156.775	S	PORT OPS	1W
76	156.825	156.825	S	PORT OPS	1W
77	156.875	156.875	S	PORT OPS	1W
78	156.925	161.525	D	TELEPHONE	
79	156.975	161.575	D	TELEPHONE	
80	157.025	161.625	D	TELEPHONE	
81	157.075	161.675	D	TELEPHONE	
82	157.125	161.725	D	CANADIAN CG	
83	157.175	161.775	D	CANADIAN CG	
84	157.225	161.825	D	TELEPHONE	
85	157.275	161.875	D	TELEPHONE	
86	157.325	161.925	D	TELEPHONE	
87	157.375	157.375	S	PORT OPS	
88	157.425	157.425	S	PORT OPS	
1001	156.050	156.050	S	COMMERCIAL	
1005	156.250	156.250	S	PORT OPS/VTS	
1007	156.350	156.350	S	COMMERCIAL	
1018	156.900	156.900	S	COMMERCIAL	
1019	156.950	156.950	S	CANADIAN CG	
1020	157.000	157.000	S	PORT OPS	
1021	157.050	157.050	S	RESTRICTED	
1022	157.100	157.100	S	CANADIAN CG	
1024	157.200	157.200	S	PORT OPS	
1025	157.250	157.250	S	PORT OPS	
1026	157.300	157.300	S	PORT OPS	
1027	157.350	157.350	S	CANADIAN CG	
1061	156.075	156.075	S	CANADIAN CG	
1062	156.125	156.125	S	CANADIAN CG	
1063	156.175	156.175	S	TELEPHONE	
1064	156.225	156.225	S	RESTRICTED	

1065	156.275	156.275	S	PORT OPS	
1066	156.325	156.325	S	PORT OPS	
1078	156.925	156.925	S	SHIP-SHIP	
1079	156.975	156.975	S	COMMERCIAL	
1080	157.025	157.025	S	COMMERCIAL	
1083	157.175	157.175	S	RESTRICTED	
1084	157.225	157.225	S	PORT OPS	
1085	157.275	157.275	S	CANADIAN CG	
1086	157.325	157.325	S	PORT OPS	
2019	--	161.550	R	PORT OPS	RX ONLY
2020	--	161.600	R	PORT OPS	RX ONLY
2023	--	161.750	R	SAFETY	RX ONLY
2026	--	161.900	R	PORT OPS	RX ONLY
2078	--	161.525	R	PORT OPS	RX ONLY
2079	--	161.575	R	PORT OPS	RX ONLY
2086	--	161.925	R	PORT OPS	RX ONLY

Canada weather channels

Channel designator	Transmitting frequencies (MHz)		S/D/R	Channel name	Restrictions
	From ship stations	From coast stations			
WX1	--	162.550	R	CANADA WX	Rx only
WX2	--	162.400	R	CANADA WX	Rx only
WX3	--	162.475	R	CANADA WX	Rx only

EAS (Emergency Alert Systems) alerts

National Codes Nature of Activation	Event Codes	Message
Emergency Action Notification (National only)	EAN	WARNING
	EAT	ADVISORY
National Information Center	NIC	ADVISORY
National Periodic Test	NPT	TEST
Required Monthly Test	RMT	TEST
Required Weekly Test	RWT	TEST

State and Local Codes Nature of Activation	Event Codes	Message
Avalanche Warning	AVW	WARNING
Avalanche Watch	AVA	WATCH
Blizzard Warning	BZW	WARNING
Child Abduction Emergency	CAE	WARNING
Civil Danger Warning	CDW	WARNING
Civil Emergency Message	CEM	WARNING
Coastal Flood Warning	CFW	WARNING
Coastal Flood Watch	CFA	WATCH
Dust Storm Warning	DSW	WARNING
Earthquake Warning	EQW	WARNING
Evacuation Immediate	EVI	WARNING
Fire Warning	FRW	WARNING
Flash Flood Warning	FFW	WARNING
Flash Flood Watch	FFA	WATCH
Flash Flood Statement	FFS	ADVISORY
Flood Warning	FLW	WARNING
Flood Watch	FLA	WATCH
Flood Statement	FLS	ADVISORY
Hazardous Materials Warning	HMW	WARNING
High Wind Warning	HWW	WARNING
High Wind Watch	HWA	WATCH
Hurricane Warning	HUW	WARNING
Hurricane Watch	HUA	WATCH
Hurricane Statement	HLS	ADVISORY
Law Enforcement Warning	LEW	WARNING
Local Area Emergency	LAE	WARNING
911 Telephone Outage Emergency	TOE	WARNING
Nuclear Power Plant Warning	NUW	WARNING
Radiological Hazard Warning	RHW	WARNING
Severe Thunderstorm Warning	SVR	WARNING
Severe Thunderstorm Watch	SVA	WATCH
Severe Weather Statement	SVS	ADVISORY

State and Local Codes Nature of Activation	Event Codes	Message
Shelter in Place Warning	SPW	WARNING
Special Marine Warning	SMW	WARNING
Special Weather Statement	SPS	ADVISORY
Tornado Warning	TOR	WARNING
Tornado Watch	TOA	WATCH
Tropical Storm Warning	TRW	WARNING
Tropical Storm Watch	TRA	WATCH
Tsunami Warning	TSW	WARNING
Tsunami Watch	TSA	WATCH
Volcano Warning	VOW	WARNING
Winter Storm Warning	WSW	WARNING
Winter Storm Watch	WSA	WATCH

For more information about the Emergency Alert System and event codes, visit: http://www.nws.noaa.gov/os/eas_codes.shtml Simrad

Special channels

Country	Item	Chart	Primary Channel
EU Standard, France, Greece, Spain, Portugal	DSC ON	EUR Default	
UK	DSC ON	EUR Default	M, M2
Belgium	DSC ON	EUR Default	31, 37, 96 (1W)
	ATIS ON	EUR Default	31, 96 (1W)
Norway, Finland	DSC ON		L1, L2, L3, F1, F2, F3
Sweden, Denmark	DSC ON		L1, L2, F1, F2, F3
Italy	DSC ON		
Italy (with coast)	DSC ON		A0, A1, A2, A3, A4, A5, A6, C0, C1, C2, C3, C4, C5, C6, C7, C8, C9
Holland	DSC ON		31 (1W), 37
	ATIS ON	EUR Default	31 (1W)
Germany	DSC ON		
	ATIS ON	EUR Default	
Austria	DSC ON	EUR Default	
	ATIS ON	EUR Default	