

# Chapter 5: Digital Selective Calling (DSC)

The Ray49 includes equipment for Class “D” Digital Selective Calling (DSC). DSC protocol is a globally applied system used to send and receive digital calls. DSC uses a unique Maritime Mobile Service Identity (MMSI) number to direct DSC calls directly to your radio, much like a telephone number.

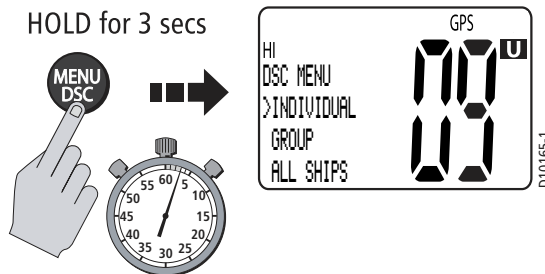
**Note:** An MMSI number is required to operate the DSC equipment in this radio. You can obtain an MMSI from BoatUS ([www.boatus.com](http://www.boatus.com)). Once obtained, you can program the MMSI number yourself one time only using the operation described in “My MMSI ID” on page 81. Otherwise, your Raymarine dealer can program or change the number for you.

The Ray49 includes a separate dedicated receiver just for DSC communications on channel 70. When a DSC call is received, the radio automatically responds based on the type of call. When receiving a DSC call from another vessel or a coast station, an alert sounds and DSC data appears in the LCD—such as time of a call, the caller and the type and priority of a call.

## 5.1 DSC Call Menu

You access DSC functions via the DSC menu. Press and hold the MENU/DSC key for 3 seconds to enter DSC call mode.

**Note:** Distress calls are made using the DISTRESS key.



The Ray49 can make the following type of DSC calls:

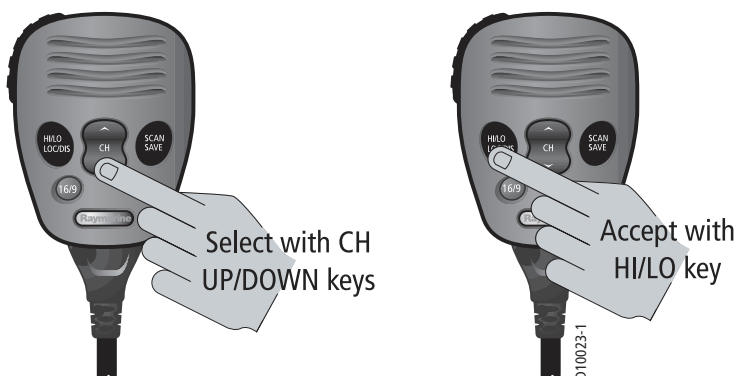
DSC Call Type	Description
DISTRESS	Sends out your MMSI number, the nature of your Distress, and the position and time information currently displayed. This information is from NMEA data, if available, or the position data you have entered manually. This digital information lets other ships and shore stations equipped with appropriate DSC equipment know where you are and that you are in a Distress situation. Distress Calls are made using the DISTRESS key.
INDIVIDUAL	Makes a ROUTINE DSC call to a specific station identified by its MMSI number.

DSC Call Type	Description
GROUP	Sends transmissions that are only received by radios sharing a common Group MMSI number. Up to 3 Group MMSI numbers can be stored and called.
ALL SHIPS	Sends out a message to all stations within range that you have important information but the situation is not serious enough for a Distress Call. All Ships calls should only be used if hailing for assistance on channel 16 fails. There are two types of All Ships Calls: SAFETY for advisory alerts and URGENCY for assistance when life is not in immediate danger.
POSITION REQUEST	This option enables you to request GPS position information from any vessel for which an MMSI number is known. You can specify the target vessel either by selecting it from your MMSI phonebook or by manually entering its MMSI number. You can also be requested to send out your position to someone else.
RECEIVED CALLS	Three separate logs listing all received DSC Call types by number and time of call. Entries are separated into the following: Distress Log, Call Log for all other types of DSC Calls, and Position Log. NOTE: You can place a call directly from a log to the station that is currently displayed. You can also add the displayed station to the DSC Phonebook.

## Making DSC Menu and Programming Selections

There are two ways to make DSC menu and character selections in your radio:

1. Most examples in this chapter describe making selections using the **CH/OK** knob on the transceiver.
2. However, you can also press the microphone up/down keys to make your selections and then press the microphone **HI/LO** key to accept.



## 5.2 Distress Calls

For a Distress Call transmission, the Ray49 takes the position and time information (either from NMEA or manually input) along with your MMSI and converts it into a digital "packet". When transmitted, this digital information lets other ships and shore stations equipped with appropriate DSC equipment know where you are and that you are in a Distress situation.

Your call can specify the nature of the Distress (designated call) or not (undesignated call).

### Sending a Distress Call

Lift the spring-loaded door on the front panel of the transceiver.

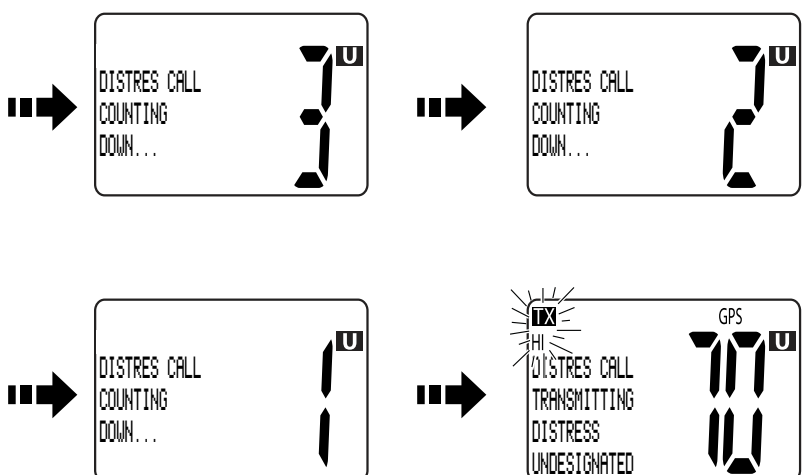
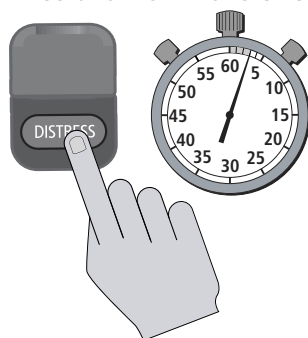


### Undesignated (Quick) Distress Call

To send a distress call without specifying its nature:

- Press and hold the red **DISTRESS** key for 3 seconds to initiate the call. During this time, the radio beeps, the display flashes and a timer counts down 03...02...01.

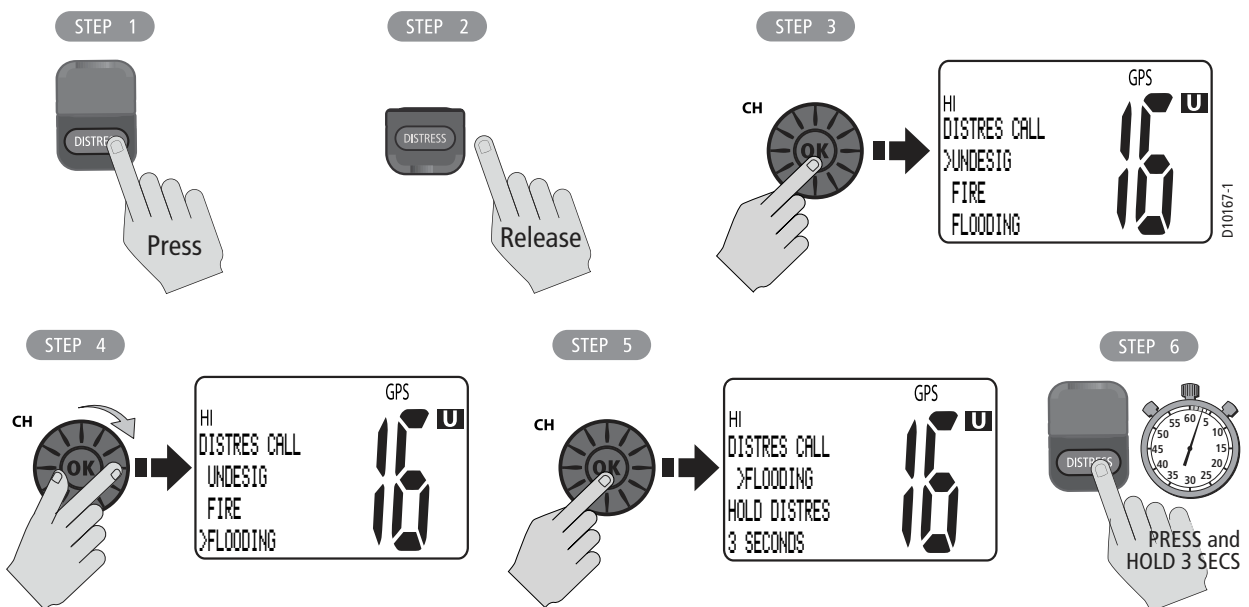
PRESS and HOLD for 3 SECS



## Designated Distress Call

To send a distress call and specify its nature:

1. Press the red **DISTRESS** key.
2. Release the **DISTRESS** key.  
The Distress Call screen appears.
3. Rotate the **CH/OK** knob until the type of Distress you wish to designate is highlighted:
  - UNDESIG(NATED)
  - FIRE
  - FLOODING
  - COLLISION
  - GROUNDING
  - LISTING
  - SINKING
  - ADRIFT
  - ABANDONING
  - PIRACY
  - MANOVERBD
  - EXIT
4. Press the **CH/OK** knob to choose that type of Distress.
5. Press and hold the **DISTRESS** key for 3 seconds to initiate the call. During this time, the radio beeps, the display flashes and a timer counts down 03...02...01... , just as with the Undesignated Distress Call illustrated above.



## Transmitting

After the Distress transmission, the radio is automatically set to channel 16 at high power to listen for and respond to voice replies from Coast Guard or other vessels that may have received your Distress Call.

### To mute the alarm:

Press **CLR/WX**.

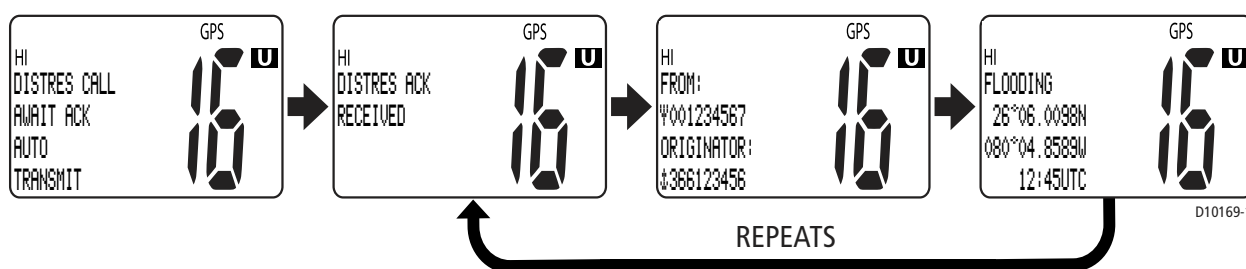
### To manually cancel the automatic Distress resend:

Press **CLR/WX** a second time.

The Distress Call is resent randomly every 3.5 – 4.5 minutes until an acknowledgement is received or the call is manually cancelled.

## Receiving Acknowledgement

After the call is sent, the radio waits for acknowledgement. The display stops flashing and the alarm sounds continuously until muted or an ACK is received.



## Cancelling a Distress Call Made in Error

If the countdown has not been completed, release the DISTRESS key before the countdown has completed.

If the countdown has completed and the distress call has been sent in error, you should make an announcement as soon as possible that the distress situation does not exist.

1. Immediately press **CLR/WX** two times to cancel the Distress Call. The radio returns to the state before the Distress Call.
2. Press the **16/9** key. The radio switches to the Priority Channel.
3. Make a broadcast to all stations giving your ship's name, call sign and MMSI number and cancel the false distress alert. For example:

"All Stations, All Stations, All Stations. This is NAME, CALL SIGN, MMSI ID, POSITION. Cancel my distress alert of DATE, TIME, NAME, CALL SIGN."


## Receiving a Distress Call

The Ray49 receives distress messages sent by another vessel and/or acknowledgments (ACK) sent by a coast station to another vessel in distress. The radio also receives distress relays.

**Note:** Class “D” DSC radios such as the Ray49 are forbidden by law from automatically acknowledging or relaying DSC distress calls. Upon receiving a distress call, you may hail the vessel in distress on channel 16 and standby to lend assistance if requested.

When a Distress Call is received, the Ray49 automatically tunes to channel 16 and sounds the Distress Alarm Tone. (If you have disabled automatic channel changing, as described on page 84, you are first prompted whether to accept the call.)

Two alternating screens appear in the display. When position data and time is included within the signal, it is displayed on the first screen in the text area of the LCD. The second screen shows the nature of the distress and time it was sent.

The 2 alternating pages of data are recorded in the Distress Log. The envelope icon () blinks until you accept the call, reject the call, or open the resulting unread message stored in the Log. See page “Received Calls (Logs)” on page 79.

### To merely mute the alert tone:

Press **CLR/WX**.

### To ignore the Distress Call:

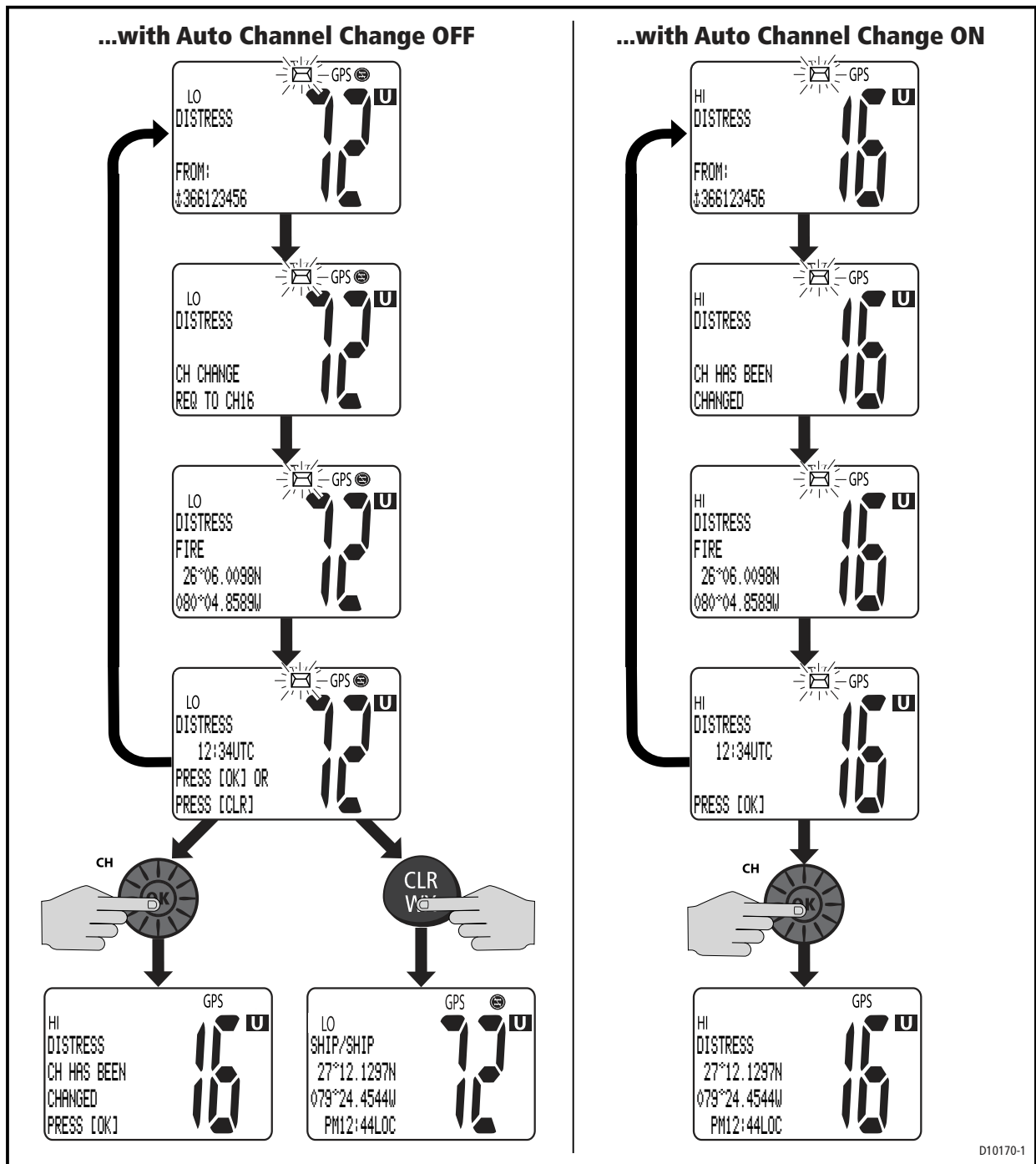
Press **CLR/WX** a second time. The envelope icon disappears, the call is interrupted, the radio declines the channel change and returns to normal operation.

### To accept a Distress Call when Auto Channel Change is OFF

1. Press the **CH/OK** knob. The alert tone is muted, the envelope icon disappears and the radio accepts the channel change and switches to channel 16.
2. Press **CH/OK** again to clear the message that the channel has been changed. Press **PTT** to communicate on channel 16.

### To accept a Distress Call when Auto Channel Change is ON

Press **CH/OK**. The alert tone is muted, the envelope icon disappears and the radio automatically switches to channel 16. Press **PTT** to communicate.



**Note:** The AUTO CH CHG option determines whether you want your radio automatically switched to channel 16 to receive the call or instead to be prompted to manually receive or decline the channel change. See page 84.

## Receiving a Distress Relay Sent by Another Station

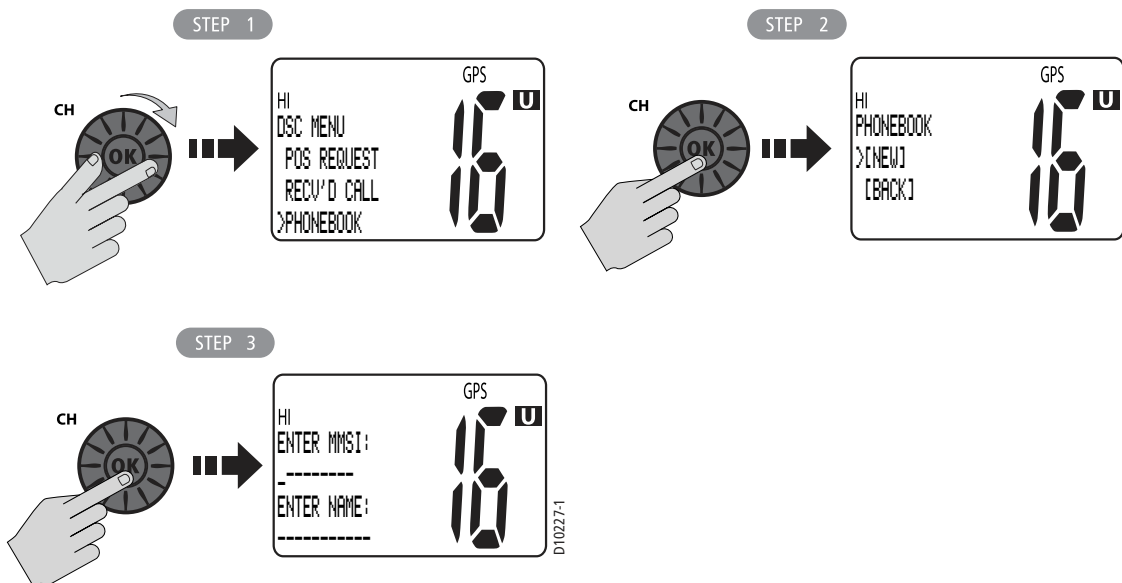
When a Distress Relay is received, an alarm sounds, the envelope icon blinks, and the LCD displays two alternating screens. Page 1 displays the Name/MMSI ID of the station sending the message. Page 2 displays the Name/MMSI ID of the vessel in distress and its lat/lon position. The radio does not resend distress relay messages.

## 5.3 DSC Phonebook

The Phonebook stores up to 31 preprogrammed MMSI numbers that you can select for making an Individual Call. The numbers are stored by name and contain the station's MMSI number. You can add, edit and delete entries from the Phonebook, much as you would on a cellular telephone. The NAME field can be up to 10 alpha-numeric characters (all capitals) in length. 13 symbols are also available. Rotate the **CH/OK** knob to make an item appear on the dot matrix display and then press in **CH/OK** to select that item.

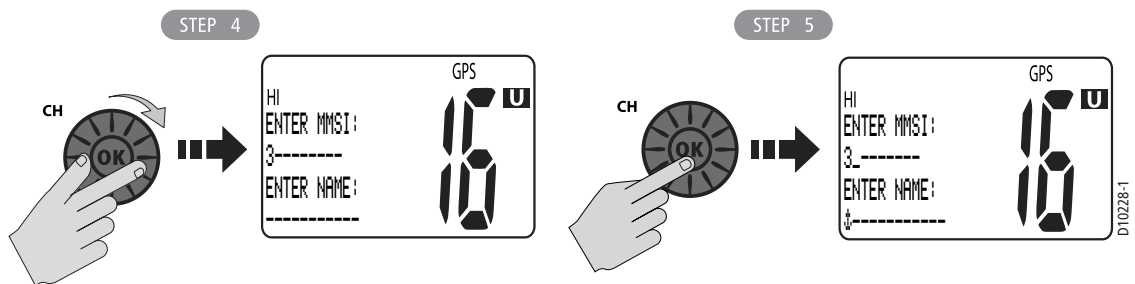
### Adding a new Entry

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to PHONEBOOK.
2. Press in the **CH/OK** knob to select.  
The list of Phonebook entries appears. The arrow is pointing to <NEW>. If no entries have yet been entered, this is your only choice.
3. Press the **CH/OK** knob again to select. You are prompted to enter the MMSI number for the new entry. The first character space to be modified is highlighted with a flashing underline.

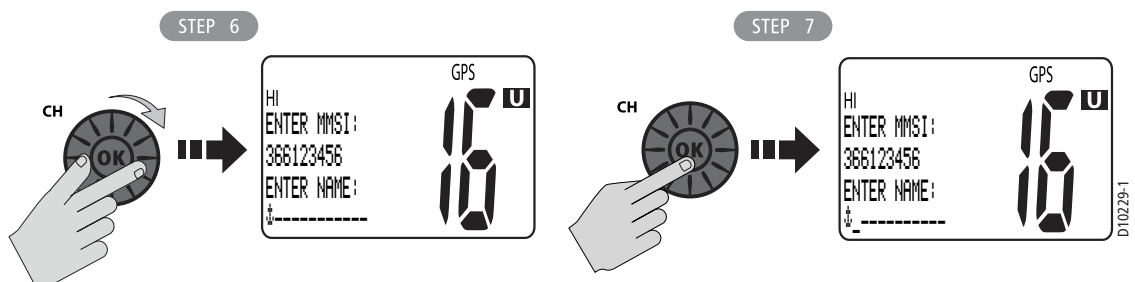


4. Rotate the **CH/OK** knob. The flashing underline is replaced with a numeric character. Continue rotating the knob to scroll through the selections.
5. When the appropriate number appears, press the **CH/OK** knob to accept. The next character to be filled in sequence is then underlined.





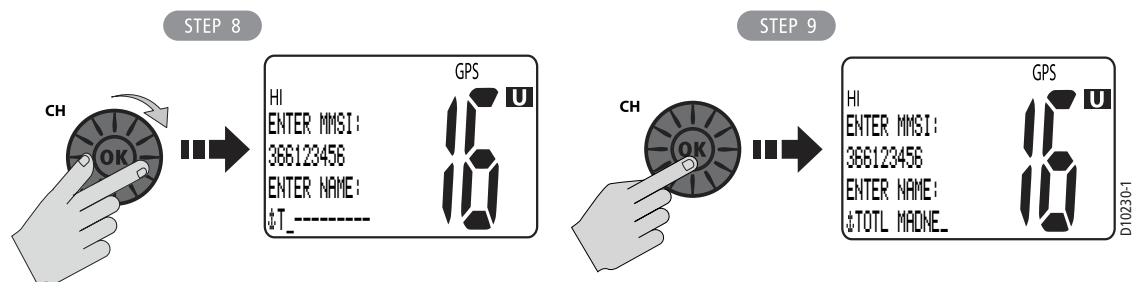
6. Continue this process until all MMSI digits have been entered.
7. When you press **CH/OK** to accept the final MSSI ID digit, the cursor moves on to the NAME field. The first character in this line is a symbol assigned by the radio, based on the MMSI number you entered.



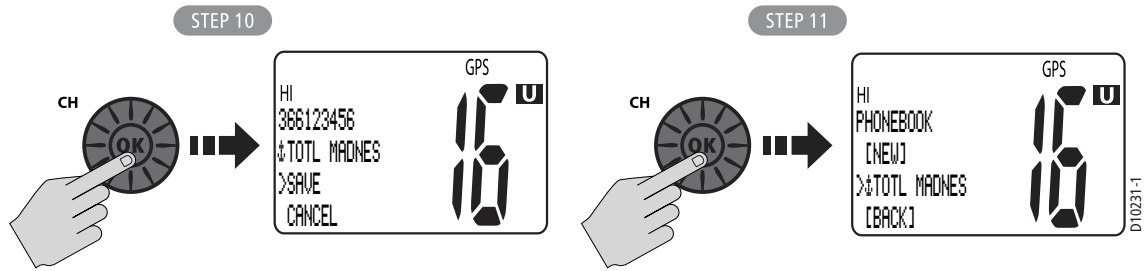
Coast Stations are identified by "00" at the beginning of the station name. If you enter 00 as the leading digits of the MMSI ID, the radio recognizes this as a coast station and automatically enters a tower symbol ( $\Psi$ ).

If you enter a number other than 0 in the initial position of the MMSI ID, an anchor symbol ( $\downarrow$ ) is entered as a prefix to the name, identifying this as a Ship Station.

8. The first character space to be modified is highlighted with a flashing underline. Using the same procedure as above, rotate the **CH/OK** knob to select the NAME characters. All alpha and numeric characters are available, as well as 13 symbols: ! # % ' ( ) : ? / . , + -
9. Press **CH/OK** to accept. Continue this process until all NAME characters have been entered.



10. When complete, press **CH/OK** to accept.
11. Press **CH/OK** again to SAVE. The new entry appears in the list.



## Editing an Existing Entry

1. From the Phonebook, rotate the **CH/OK** knob until the arrow is pointing to the entry you wish to edit.
2. Press **CH/OK**. The list of options appear.
3. Rotate the **CH/OK** knob until the arrow is pointing to EDIT
4. Press **CH/OK** to select.
5. Make your changes to the NAME and MMSI ID, using **CH/OK**.
6. When finished, press **CH/OK** to save your changes. The revised name or MMSI number appears in the list.

## Deleting an Existing Entry

1. From the Phonebook, rotate the **CH/OK** knob until the arrow is pointing to the entry you wish to edit.
2. Press **CH/OK**. The list of options appear.
3. Rotate the **CH/OK** knob until the arrow is pointing to DELETE.
4. Press **CH/OK** to confirm your selection. The entry is removed from the list.

## 5.4 Individual Calls

The Ray49 can make Individual Routine calls.

### Making DSC Calls to Coast Stations

The examples in this handbook illustrate making DSC calls to Ship Stations. However, the procedures for making Individual Calls to a Coast Station are different. Calls to a Ship Station require that you enter a subsequent working channel chosen from a pre-programmed list offered to you by the Ray49. Calls to a Coast Station remove this step from the operating procedures. The Coast Station controls and indicates the subsequent working channel within its acknowledgement.

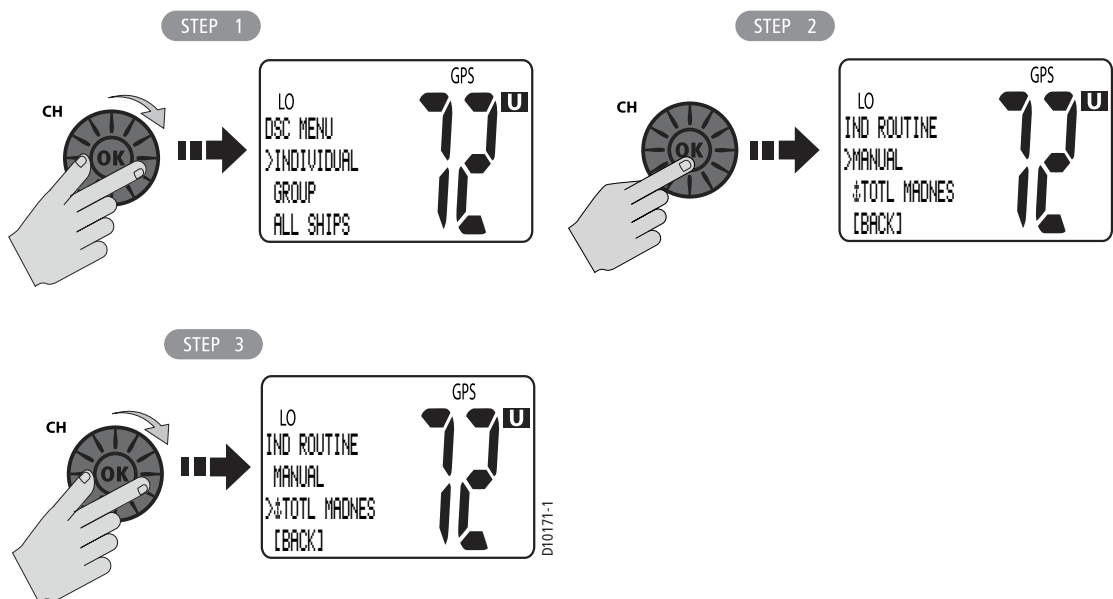
The Ray49 automatically detects the correct procedures for you based on the type of MMSI number you enter manually or with or the phonebook. If "00" is detected as the first two characters of the MMSI, Coast Station procedures are implemented automatically.

**Note:** When making a call to a coast station, you will not be asked to select a working channel because that will be provided by the coast station.

## Transmitting an Individual Call

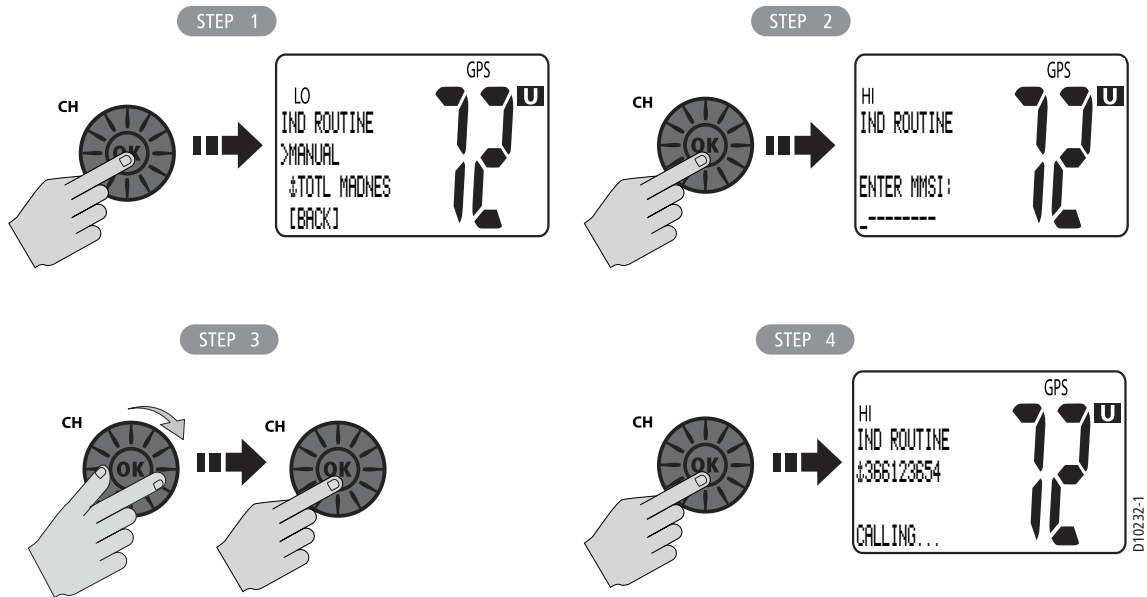
To make an Individual Call to a ship or coast station, you must select the specific MMSI number to contact and the working channel to be used for the call. The MMSI ID can be entered manually or selected from a Phonebook list of preprogrammed numbers specified using the MENU function, as follows:

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to INDIVIDUAL.
2. Press **CH/OK**. The Individual Routine menu appears, which displays any Phonebook entries you have saved and <MANUAL> for manual number entry.
3. Rotate the **CH/OK** knob until the arrow points to the desired individual name.



### If using MANUAL MMSI ID entry:

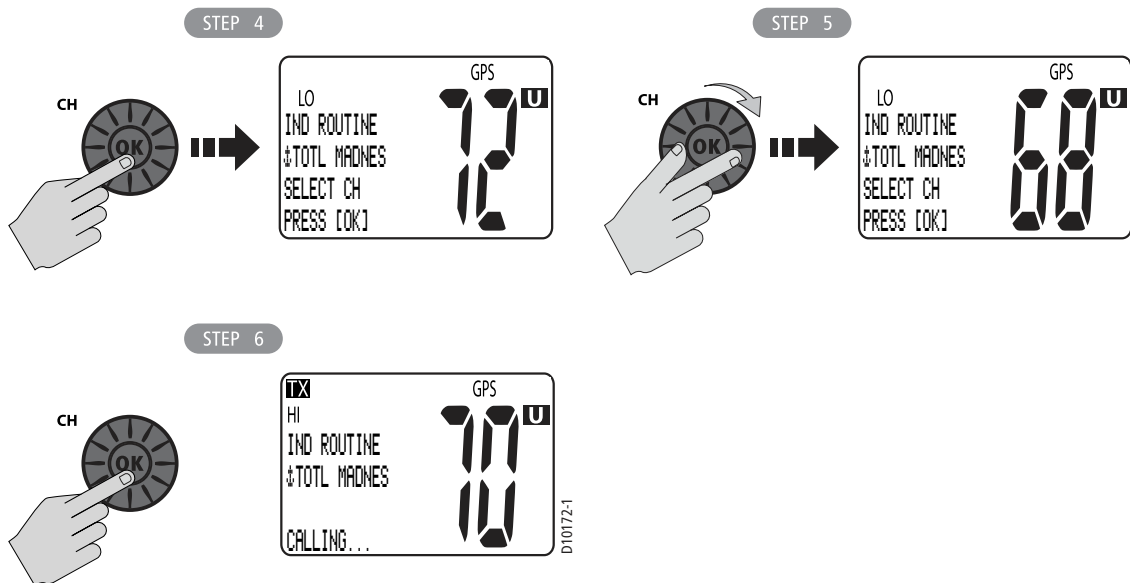
Enter the MMSI number using the **CH/OK** knob. Rotate **CH/OK** to select each character and then press in to accept. The next position to be modified is indicated by a blinking underline. A more-detailed description of manual character entry can be found in "Adding a new Entry" on page 64.



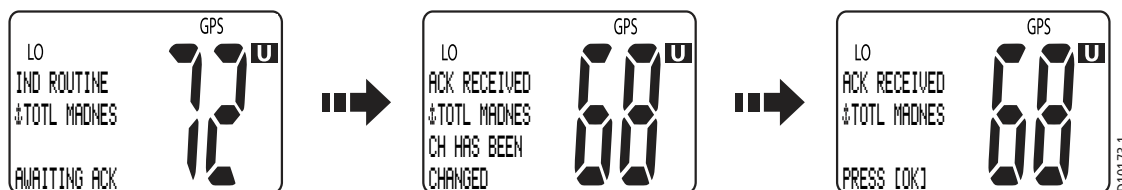
4. When the desired name is highlighted, press SELECT.
5. Rotate the **CH/OK** knob to select the working channel to be used for the Individual Call and then press in **CH/OK** to accept. Select from 06, 08, 09, 10, 13, 16, 17, 67, 68, 69, 71, 72, 73 or 77.

**Note:** Individual Calls to a Coast Station remove this step from the operating procedures. The Coast Station controls and indicates the working channel within its ACK.

6. Press **CH/OK** to transmit the call. The Individual Call is transmitted on channel 70, the radio tunes to the original channel and waits for acknowledgement. During this period you are still able to receive calls.



7. When the acknowledgement is received, the radio automatically switches to the selected working channel and sounds a DSC Call alert ring. Press **CH/OK** to confirm.

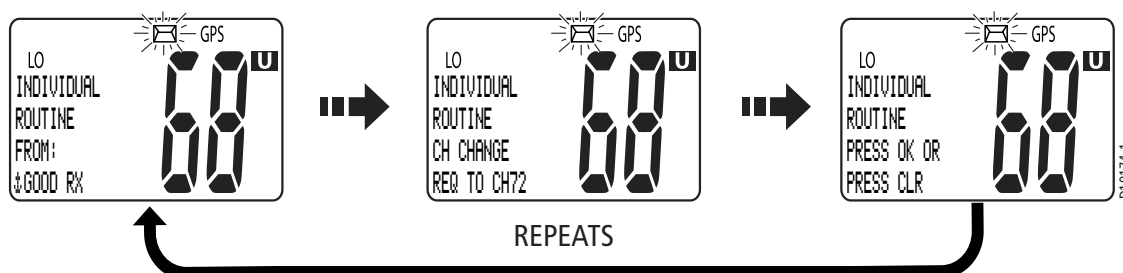


Press **PTT** to communicate on the specified channel. Pressing PTT at any time before an ACK is received cancels the Individual Call

## Receiving Individual Calls

When an Individual Call is received, an alert tone sounds, the envelope icon blinks and the LCD alternates among 3 screens displaying the name (or MMSI ID) of the station initiating the call and that a request for a change of working channels is being made. The channel does not change until you accept.

The 3 alternating pages of data are recorded in the Call Log. The envelope icon (✉) blinks until you accept the call, reject the call, or open the resulting unread message stored in the Log. See page "Received Calls (Logs)" on page 79.



### To mute the alert tone:

Press **CLR/WX**. Automatic cancellation takes place after 2 minutes.

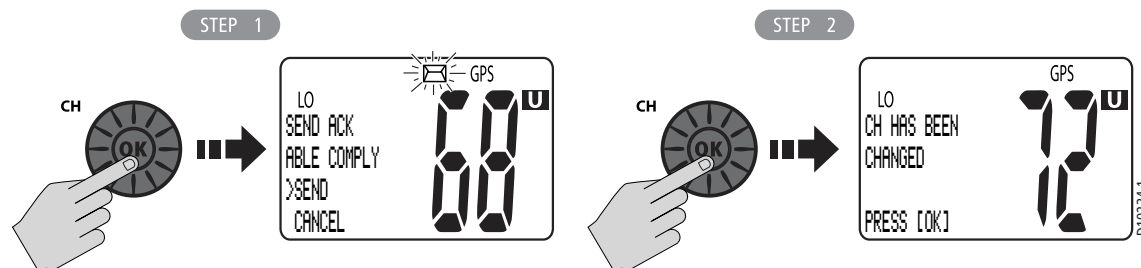
### To ignore the Individual Call:

Press **CLR/WX** a second time. The envelope icon disappears, the call is interrupted and the normal screen appears on the LCD.

### To accept an Individual Call:

1. Press **CH/OK** to change channels to the one designated by the caller. The alert tone is muted and the envelope icon disappears.
2. If the caller requests an acknowledgement, press **CH/OK** to send.
3. When the caller responds to the ACK, press **CH/OK** to return to standby mode. Establish voice communications on the designated channel by pressing **PTT**.

If the caller requests that you change to an unsupported working channel the message INVALID CHANNEL appears on the LCD. If an acknowledgement is sent, the originating station is sent the message UNABLE TO COMPLY, indicating that your radio could not make the requested channel change.



## 5.5 Group Calls

The Group Call feature sends transmissions that are only received by radios sharing a common Group MMSI number, such as a flotilla or racing fleet. The Ray49 sends Group Routine calls.

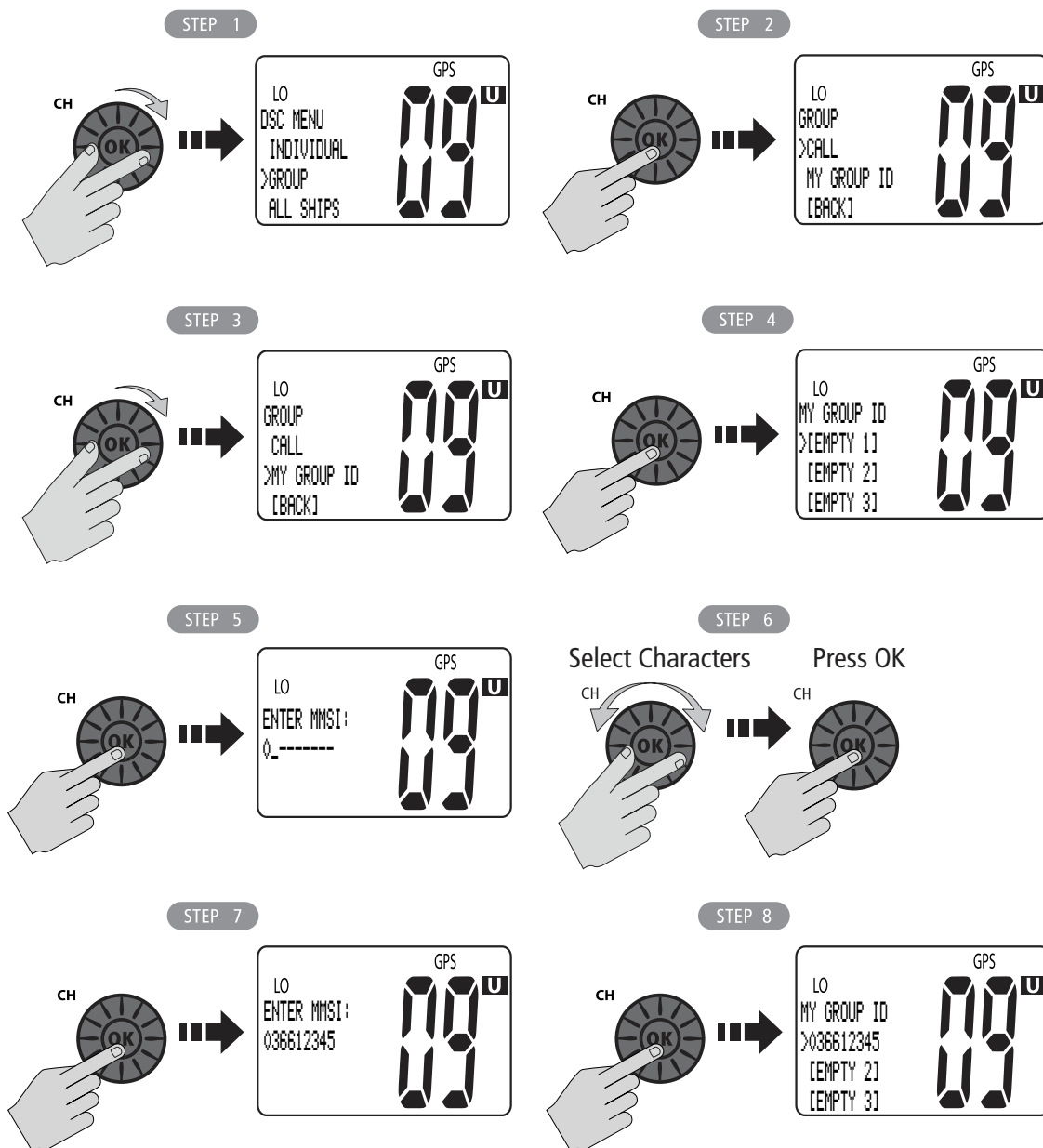
### Group MMSI Setup

You can program up to three Group MMSI ID numbers. Group MMSI ID numbers always begin with a zero (0). You only enter the last 8 digits of the Group ID number; the initial "0" is automatically entered for you.

#### Adding a New Group

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to GROUP.
2. Press **CH/OK** to select. Group options appear, with the arrow pointing to CALL.
3. Rotate **CH/OK** until the arrow points to MY GROUP ID.
4. Press **CH/OK** to select. If existing Group MMSI ID numbers are already stored, those values appear. If blank, <EMPTY 1>, <EMPTY 2>, etc. are shown to indicate that the Group IDs have not yet been programmed. Select the first available empty group location.
5. Press **CH/OK** to select. The GROUP MMSI field appears. The initial "0" is automatically entered for you, indicating that this is a Group MMSI ID. The first character space that you can modify is highlighted with a flashing underline.
6. Fill in the GROUP MMSI fields one number at a time, using the **CH/OK** knob:
  - Rotate to **CH/OK** display the desired character.
  - Press in **CH/OK** to accept and move on to the next character space. Repeat this process to fill in all MMSI numbers. (A more-detailed description of manual character entry can be found in "Adding a new Entry" on page 64.)
7. Press **CH/OK** to accept.
8. When complete, press **CH/OK** to confirm. The new entry appears in the list.

Use the same procedure to edit an existing entry in the list.

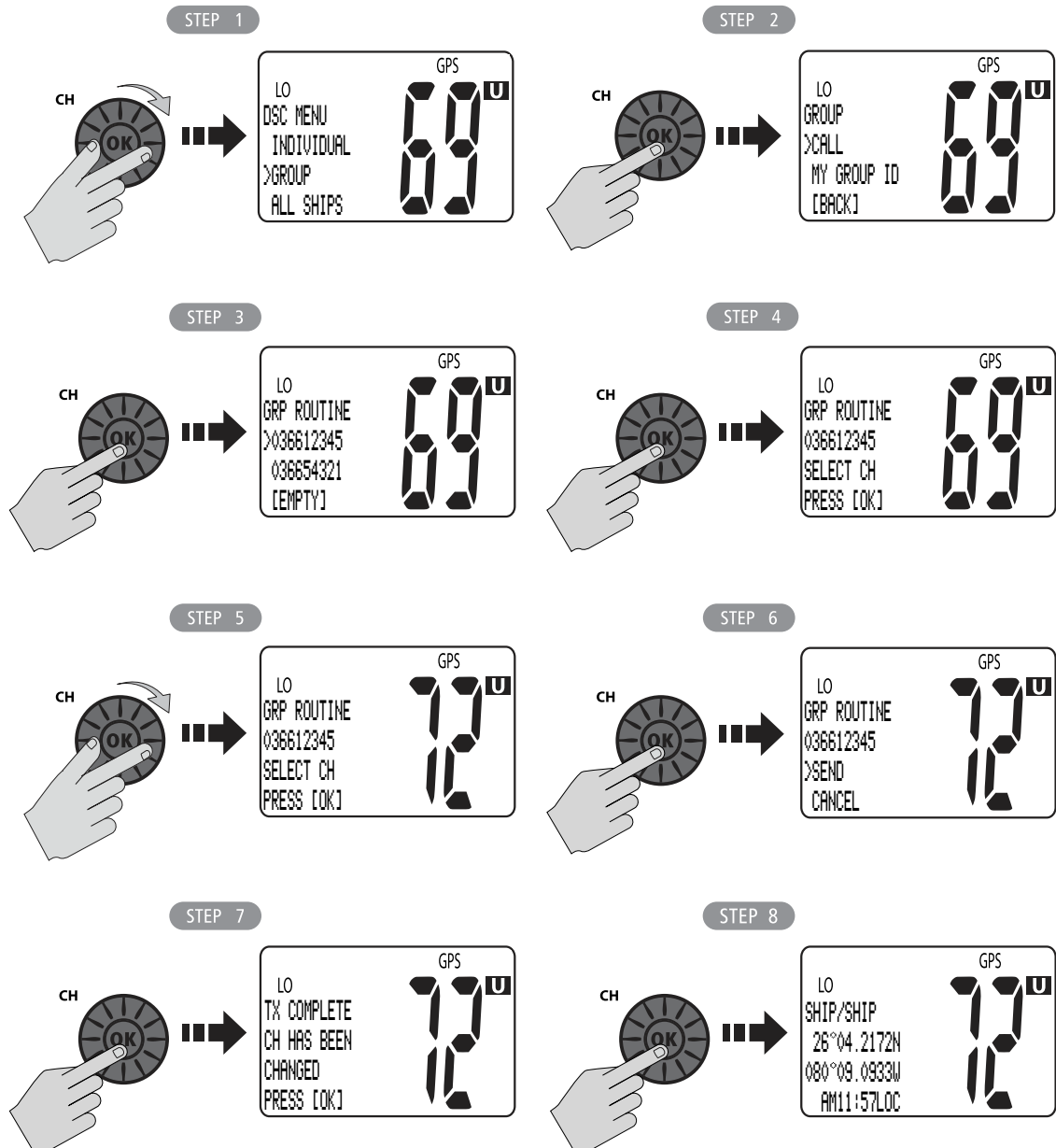


## Transmitting a Group Call

To call another vessel in the group, select the Group Name to contact from the list of numbers described in the preceding section and the working channel to be used for the Group Call.

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to GROUP.
2. Press **CH/OK** to select. Group options appear, with the arrow pointing to CALL.
3. Press the **CH/OK** knob to select CALL. The group entries that you have saved appear. Point to the group name you wish to call.
4. Press **CH/OK** to select.

5. Rotate **CH/OK** to select the working channel to be used for the call.
6. Press **CH/OK** to select. You are prompted to send the call or cancel the call.
7. Press **CH/OK** to transmit the Group Call.  
The Group Call is transmitted on channel 70, and the radio tunes to the designated working channel to be used for the Group Call.
8. Press **CH/OK** to confirm and converse on the designated channel.



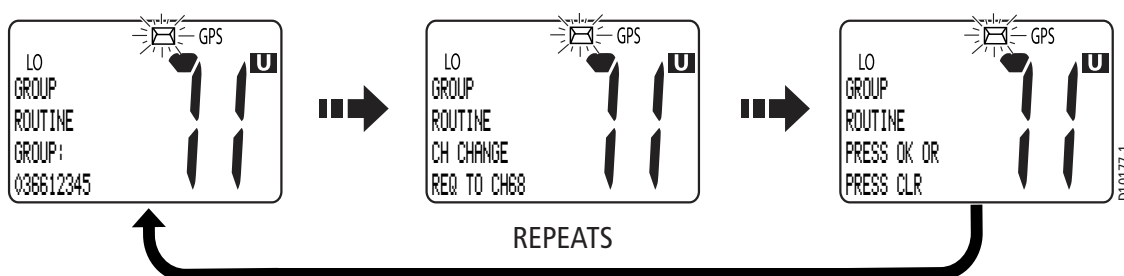


## Receiving Group Calls

The Ray49 can receive Group Routine Calls from anyone in your prearranged group.

When a Group Call is received, the LCD alternates among 3 screens displaying the or MMSI ID of the station in the group initiating the call and that a request for a change of working channels is being made.

The 3 alternating pages of data are recorded in the Call Log. The envelope icon (✉) blinks until you accept the call, reject the call, or open the resulting unread message stored in the Log. See page "Received Calls (Logs)" on page 79.



### To mute the alert tone:

Press **CLR/WX**. Automatic cancellation takes place after 2 minutes.

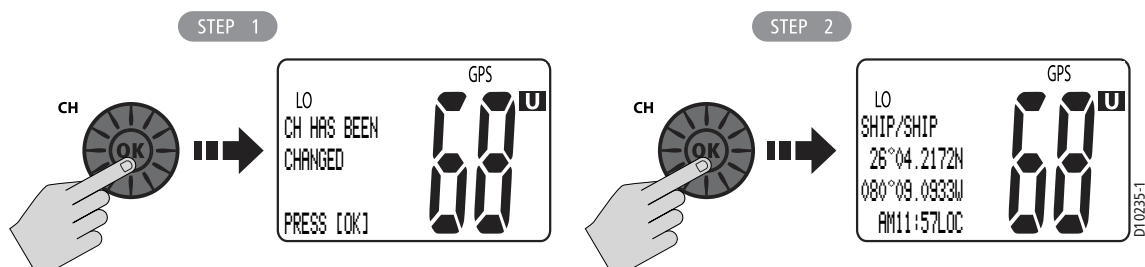
### To ignore the Group Call:

Press **CLR/WX** a second time. The envelope icon disappears, the call is interrupted and the normal screen appears on the LCD.

### To accept the Group Call:

1. Press **CH/OK** to change channels to the one designated by the caller. The alert tone is muted and the envelope icon disappears.
2. Press **CH/OK** to return to the standby mode. Establish voice communications on the designated channel by pressing **PTT**.

If the caller requests that you change to an unsupported working channel the message **INVALID CHANNEL** appears on the LCD. If an acknowledgement is sent, the originating station is sent the message **UNABLE TO COMPLY**, indicating that your radio could not make the requested channel change.

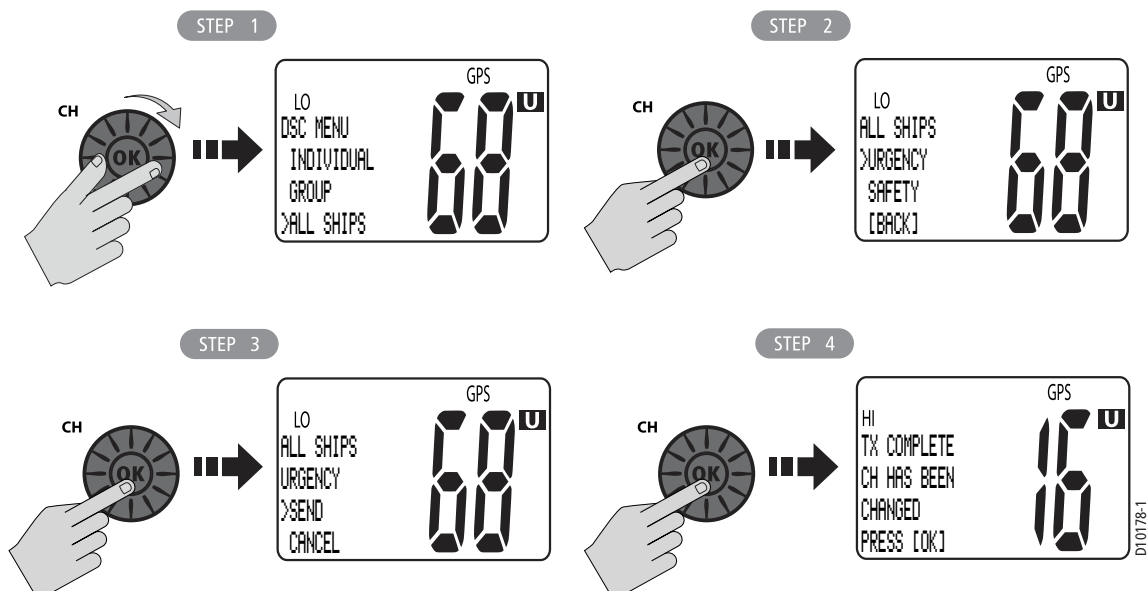


## 5.6 All Ships Calls

An All Ships Call sends out a message to all stations within range. The Ray49 can make All Ships Safety Calls for advisory alerts and Urgency Calls when assistance is required but life is not in danger. For example, you might send a Safety Call to warn others there is a large floating object that may be a hazard to navigation. A sample Urgency Call might be that you have an illness or an accident on board. The All Ships Call is made on channel 70, and then the radio automatically switches to channel 16 at high power for voice communications.

### Transmitting an All Ships Call

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to ALL SHIPS.
2. Press **CH/OK** to select. Choose the type of call you wish to make: URGENCY or SAFETY.
3. Press **CH/OK** again to transmit the call. The call is transmitted on channel 70, and then the radio tunes to channel 16 at high power.
4. Press **CH/OK** to reconfirm the All Ships Call. The radio returns to standby mode.  
Press **PTT** to communicate on channel 16.



### Receiving an All Ships Call

How the radio processes an incoming All Ships Call depends upon the call's priority. Routine and Safety calls have a lower priority than All Ships Urgency and Distress calls.

## All Ships Routine or Safety

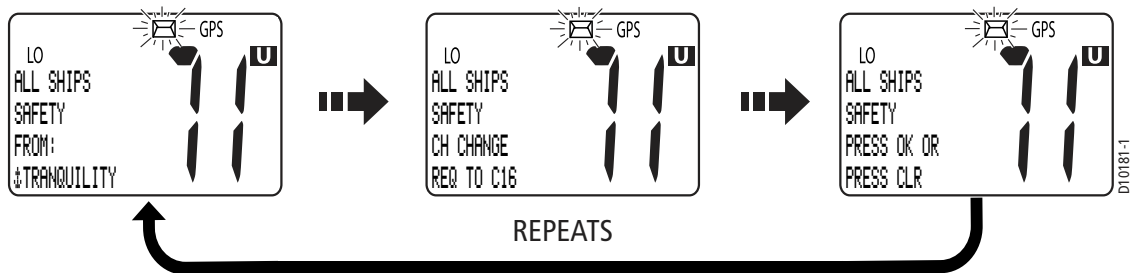
When an All Ships Routine or Safety Call is received, the LCD alternates among 3 screens displaying the name (or MMSI ID) of the station initiating the call and that a change of channels has been made. The 3 alternating pages of data are recorded in the Call Log. The envelope icon (✉) blinks until you accept the call, reject the call, or open the resulting unread message stored in the log. See page “Received Calls (Logs)” on page 79.

### To mute the alert tone:

Press **CLR/WX**. Automatic cancellation takes place after 2 minutes.

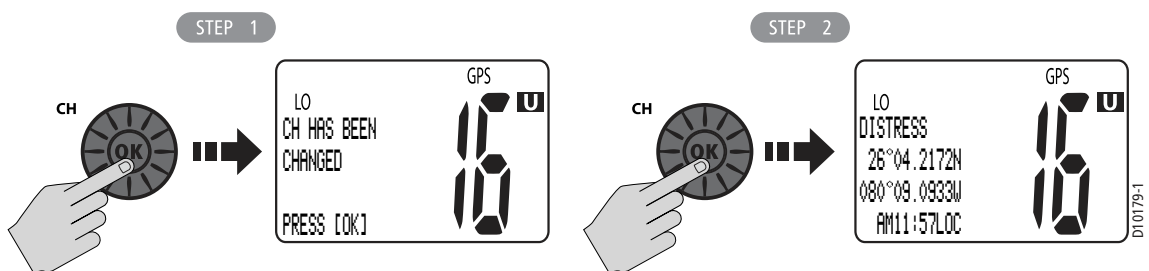
### To ignore the All Ships Call:

Press **CLR/WX** a second time. The envelope icon disappears, the call is interrupted and the normal screen appears on the LCD.




### To accept an All Ships Routine or Safety Call:

1. Press the **CH/OK** knob. The alert tone is muted, the envelope icon disappears and the radio switches to channel 16.
2. Press **CH/OK** again to confirm the channel change. The radio returns to standby mode. Press **PTT** to communicate on channel 16.



## All Ships Urgency or Distress Call

For an Urgency or Distress Call, the Automatic Channel Change option (see page 84) determines how the call is handled. If set ON, the radio automatically switches to Priority Channel 16 for voice communications. If OFF, you are prompted to manually accept or decline the call and channel change by pressing **CH/OK** or **CLR/WX**, respectively. When set OFF, the  icon appears.



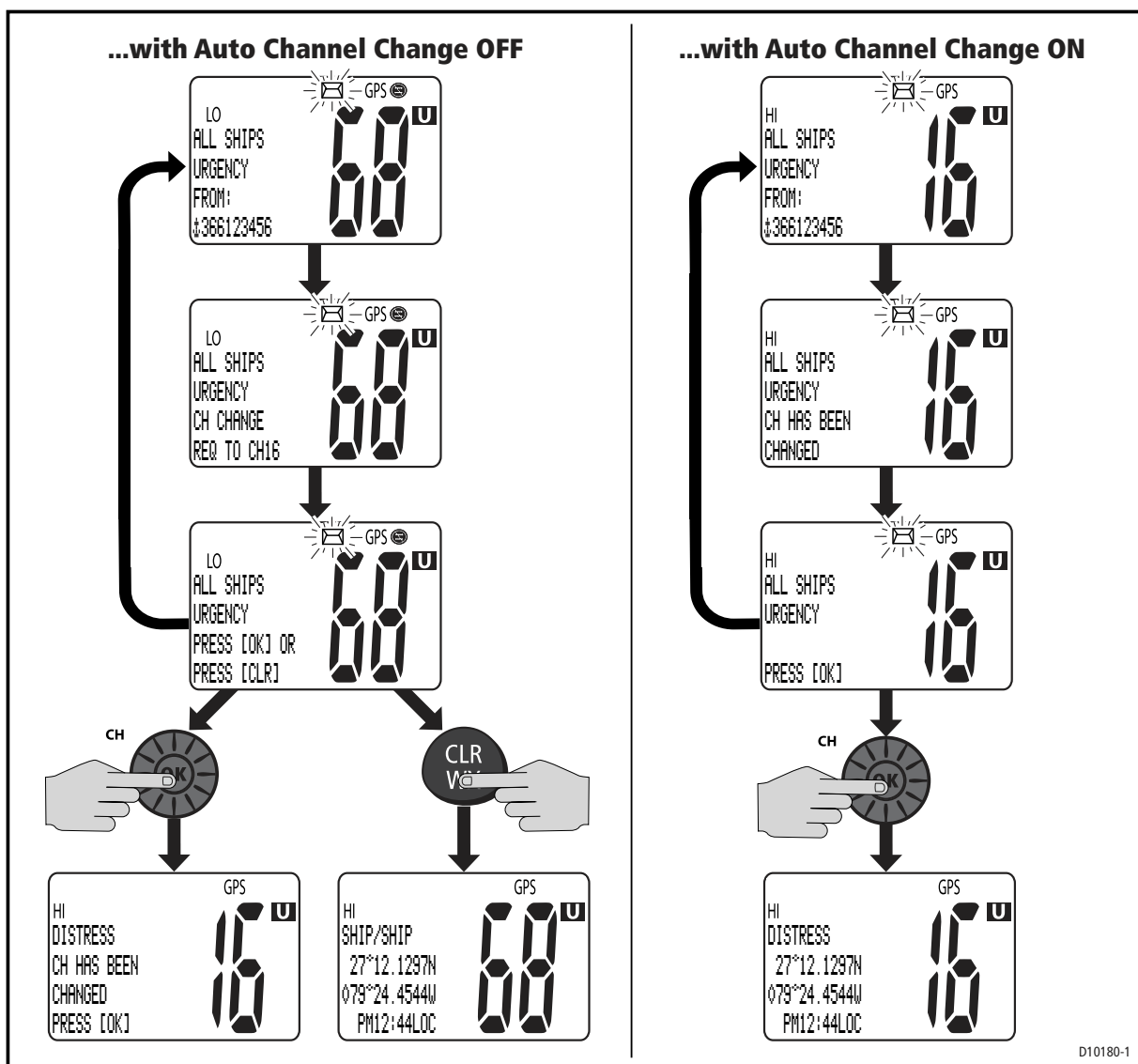
### To accept an All Ships Urgency or Distress Call when Auto Channel Change is OFF

1. Press **CH/OK**. The alert tone is muted, the envelope icon disappears and the radio switches to channel 16.
2. Press **CH/OK** again to confirm the channel change. The radio returns to standby mode. Press **PTT** to communicate on channel 16.

### To accept an All Ships Urgency or Distress Call when Auto Channel Change is ON

Press the **CH/OK** knob. The alert tone is muted, the envelope icon disappears and the radio automatically switches to channel 16. Press **PTT** to communicate.

If the caller requests that you change to an unsupported working channel the message INVALID CHANNEL appears on the LCD. If an acknowledgement is sent, the originating station is sent the message UNABLE TO COMPLY, indicating that your radio could not make the requested channel change.

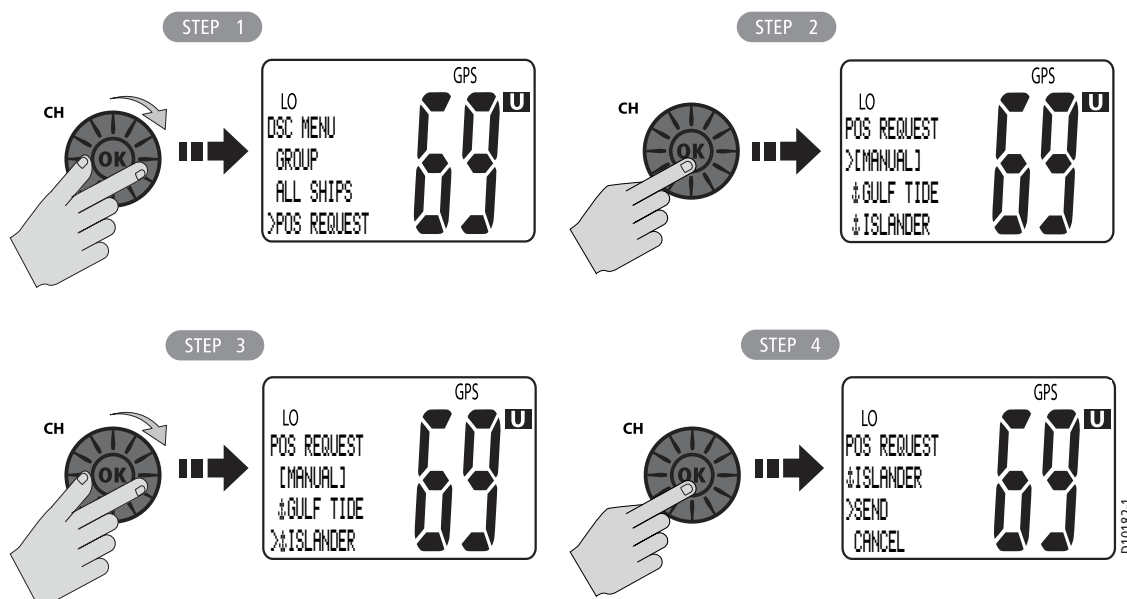


## 5.7 Position Request

With this option you can request GPS position information from any station capable of responding to this type of call and for which an MMSI number is known. You can specify the target station either by selecting it from your MMSI phonebook or by manually entering its MMSI number.

### Specifying the Target Vessel

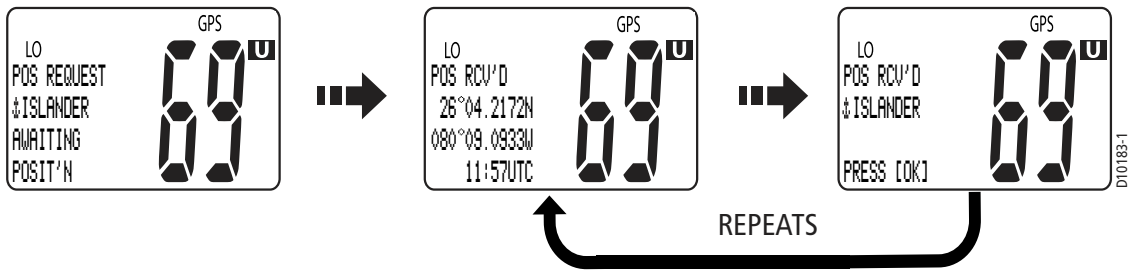
1. Select POS REQUEST from the DSC menu.
2. Select the target station name from the phonebook.  
—or—  
Select <MANUAL> and enter the target station's MMSI number, as described in "Adding a new Entry" on page 64.
3. Press SEND to transmit the Position Request Call.  
The call is transmitted on channel 70, and then the radio tunes to the original channel and waits for acknowledgement. During this period you are still able to receive calls.



#### When the Position Request is accepted by the receiving station:

When the position request is received, the Ray49 shows that the call has been accepted by the requested station. The radio sounds a Call Alert tone. Press any key to mute the alert tone. It shuts off automatically after two minutes.

Press **CLR/WX** to exit to normal radio operation. You can retrieve the position information later using DSC MENU > RECV'D CALLS > POSIT'N LOG.



## Retrieving the Last Received Position Data

1. From the DSC Menu, select **RCV'D CALLS**.
2. Rotate the **CH/OK** knob or press the up down arrow keys to select **POSIT'N LOG**.
3. Press **CH/OK**. The last received position request data (LAST CALL) is displayed.

**Note:** Only the last position is saved. The next received position will overwrite the existing position data.

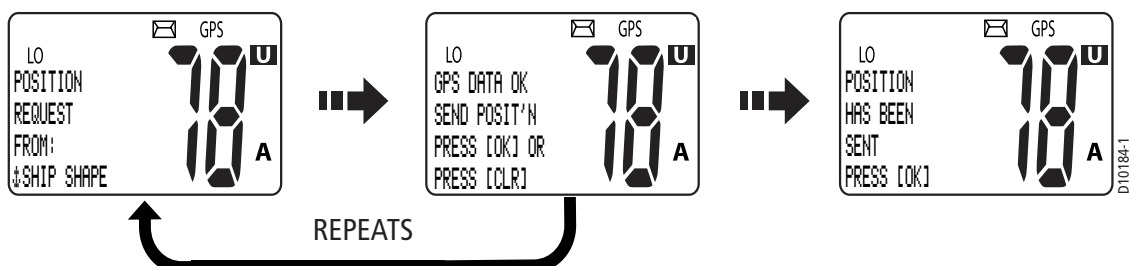
Press **BACK** or the **CLR/WX** key to exit.

## Receiving a Position Request From Another Station

If you receive a position request from another station, how the Ray49 responds depends on the option you have set in the Position Reply menu item (see page 85). **OFF** will not send position data under any circumstances. **AUTO** sends out your vessel's position data as soon as it is requested. **MANUAL** sends out the data only after you respond to the request.

The 2 alternating pages of data are recorded in the Posit'n Log. The envelope icon (✉) blinks until automatically accepted or you manually accept the call, reject the call, or open the resulting unread message stored in the Log. See page "Received Calls (Logs)" on page 79.

When a Manual Position Reply is received, the requesting station's MMSI number or station name (if entered in the Phonebook) is displayed. Press **CH/OK** to accept the request to send your position data. Decline the request by pressing the **CLR/WX** key.



## 5.8 Received Calls (Logs)

The radio maintains lists of the last received DSC call types by number and time of call. Separate logs are maintained for the following:

1. Distress (up to 10 entries, per log)
  - Distress Log
  - Distress ACK Log
  - Distress Relay Log
2. Call Log (up to 20 total entries)
  - Individual Calls
  - All Ship Calls
  - Group Calls
3. Position Log
  - Last call received

If the calling vessel or station is listed in your DSC Phonebook, the vessel or station name appears in the display as it is listed. If the caller is not listed in your directory, the caller's MMSI ID number appears in the display.



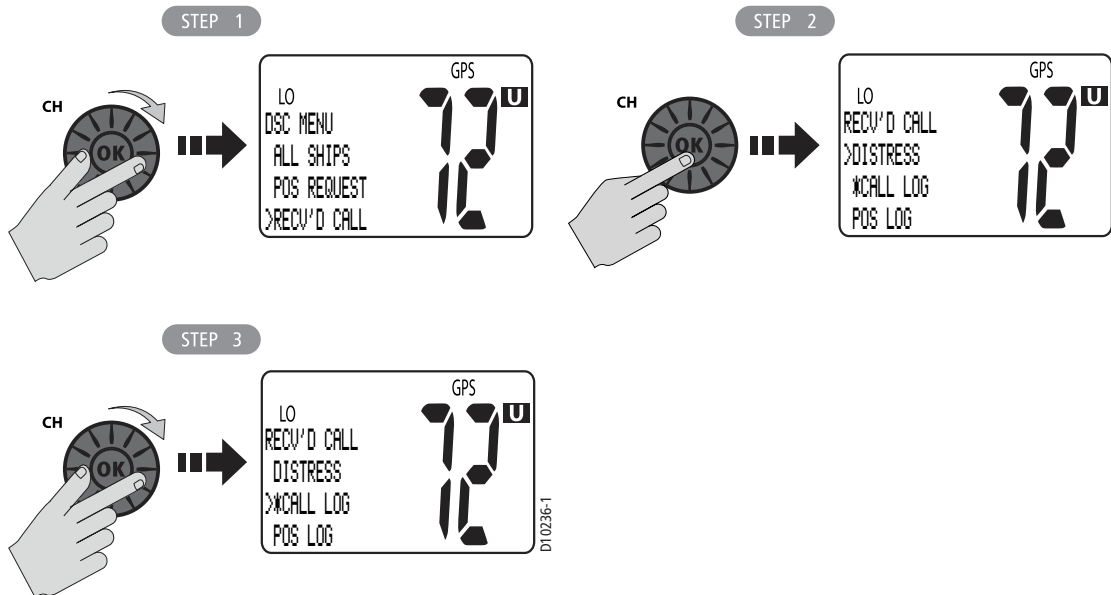
When a DSC Call is received, the envelope icon blinks on the LCD and an asterisk (\*) appears to the left of the appropriate log. The envelope icon and arrow symbol disappear when the log is opened.

Coast Stations are identified by MMSI ID numbers beginning with "00". If you have assigned a name for a Coast Station in the phonebook, a tower symbol (Ψ) precedes the name field in the log to identify it as such. Similarly, Group Stations have a single "0" in the initial MMSI number position. If the MMSI ID begins with any number other than "0", an anchor symbol (⚓) is entered as a prefix to the name, identifying this as a Ship Station.

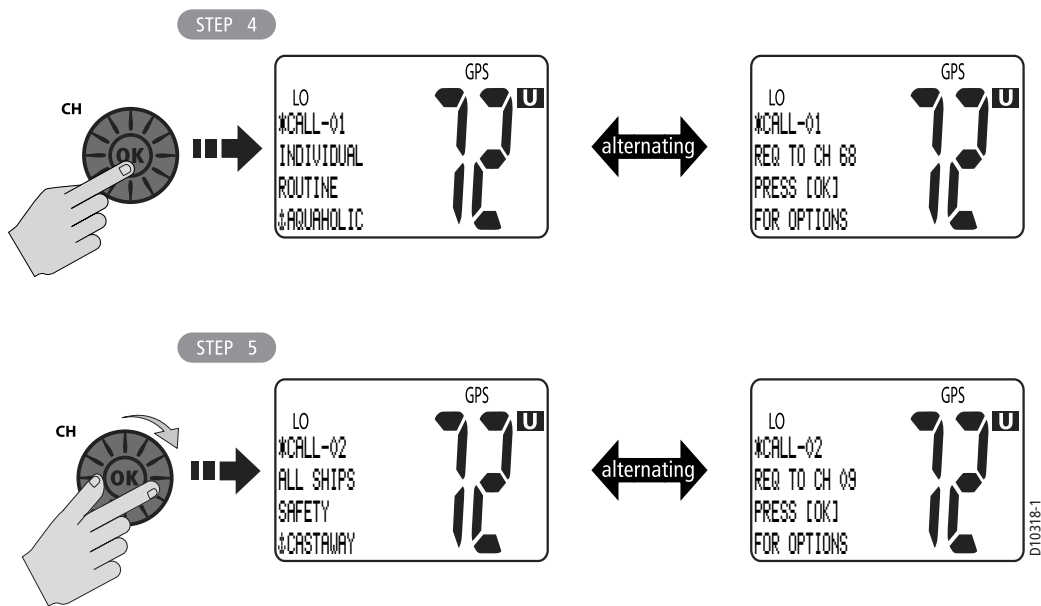
Station Type	MMSI ID Layout	Phonebook/ Log Symbol
Ship	xxxxxxxx	⚓
Group	0xxxxxxxx	none
Coast	00xxxxxxxx	Ψ

**To view the Received Call Logs:**

1. From the DSC menu, rotate the **CH/OK** knob until the arrow points to **RECV'D CALL**.
2. Press **CH/OK**. Three log categories appear: **DISTRESS**, **CALL LOG** and **POSIT'N LOG**. If any of these logs contain an unread item, an asterisk (\*) appears to the left of the log name.
3. Rotate the **CH/OK** knob until the arrow points to the desired log.



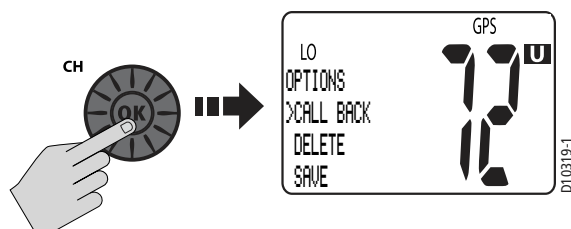
4. Press **CH/OK** to select. Entry 01 appears first with call type and time of the last call. This is the most recent call.
5. Using the **CH/OK** knob on the transceiver or **CH** up/down arrows on the microphone, scroll down the list of up to 30 entries.





## Log Entry Options

The DSC Call Logs provide additional options for each entry. When the prompt appears PRESS [OK] FOR MORE OPTIONS, press the **CH/OK** knob. Select from the following:



- Call Back. Makes a routine Individual Call to the caller listed in the entry.
- Delete. Remove this entry from the log.
- Save. Stores any undefined MMSI number into the Phonebook and enables you to assign a corresponding name to it. If a name is already assigned for this MMSI number in the phonebook, you are prompted to edit the name.

## 5.9 DSC Setup

The DSC Setup menu item is used to determine the following functions:

- the radio's MMSI ID number
- how your radio responds to a Position Reply request
- whether your radio automatically changes channels for incoming Distress and All Ships Urgency Calls

### To adjust the DSC settings:

1. Press and hold the **MENU/DSC** key for 3 seconds to enter DSC Menu mode.
2. Rotate the **CH/OK** knob until the arrow points to DSC SETUP.
3. Press **CH/OK** to accept. The DSC Setup screen appears.

Make your selection from the following options:

- MY MMSI ID
- AUTO CH CHG
- POS REPLY

### My MMSI ID

This operation stores the MMSI number required for DSC communications, including Distress Calls. If you try to access a DSC function before entering the MMSI number, an error message appears and you are prompted to enter the MMSI ID.

**Note:** You can obtain an MMSI number from BoatUS ([www.boatus.com](http://www.boatus.com)).

This is a one time operation. After the MMSI number is programmed:

- you will not be able to change it
- only your dealer/distributor can change it
- after entering your MMSI ID, accessing this menu item will merely display the programmed number

**To enter or view the MMSI ID number:**

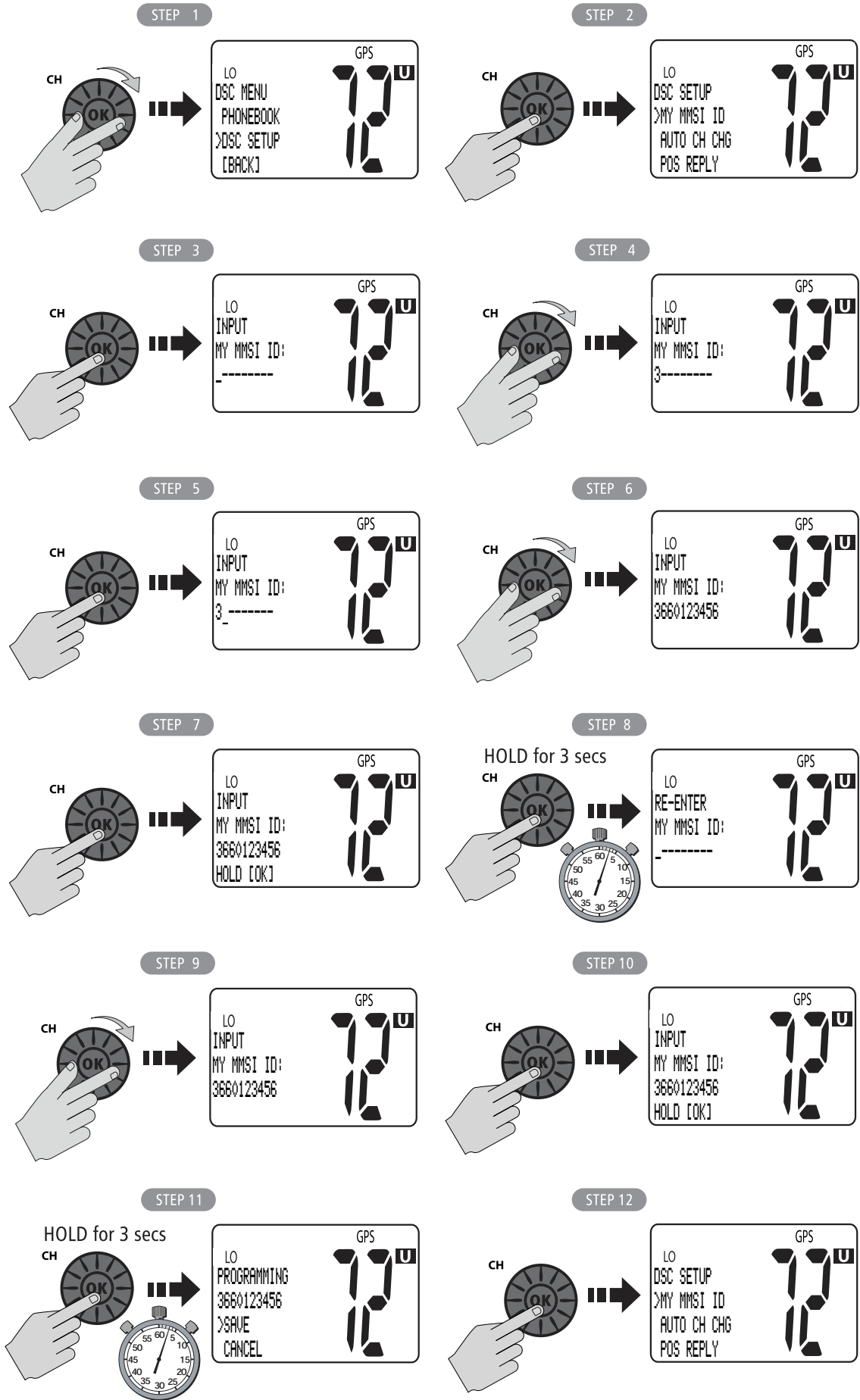
1. From DSC MENU, rotate the **CH/OK** knob until the arrow points to DSC SETUP.
2. Press the **CH/OK** knob to accept. The DSC SETUP menu items appear.
3. Press **CH/OK** to select MY MMSI ID.  
If an existing MMSI ID is stored, the value appears. If the MMSI ID is blank, dashes appear, indicating that one has yet to be entered. The first character space to be modified is highlighted with a flashing underline.
4. Rotate the **CH/OK** knob. The flashing underline is replaced with a numeric character. Continue rotating the knob to scroll through the selections.
5. When the appropriate number appears, press **CH/OK** to accept. The next character to be filled in sequence is then underlined.
6. Continue this process until all MMSI characters have been entered.

**Note:** If you accidentally select an incorrect digit, press CLR to move the cursor back to the left.

7. When all digits have been selected, press **CH/OK** to accept.
8. Press and hold the **CH/OK** knob. You are prompted to re-enter the MMSI number.
9. Using the **CH/OK** knob, re-enter all nine MMSI digits to confirm.
10. Press **CH/OK** to accept your selections.  
If the second entry does not match the first entry, a warning message is displayed and you are prompted to retry.
11. When complete, press and hold **CH/OK** to accept.
12. Press **CH/OK** one last time to SAVE the MMSI ID number and return to the DSC SETUP screen.


**Note:**

- You cannot begin the MMSI ID number with "0" (single zero), as this prefix indicates a GROUP ID.
- You cannot begin the MMSI ID number with "00" (double zero), as this prefix indicates a COAST STATION.



## Automatic Channel Changing for Incoming Calls


For incoming Distress and All Ships Urgency Calls, this option determines whether your radio automatically switches to Priority Channel 16 to receive the call or prompts you to manually accept or decline the channel change.

The default setting is to ENABLE the auto channel change. If set OFF, the  icon appears on the LCD.

This feature is useful for preventing your radio from automatically switching channels while you are maintaining a continuous watch on a certain channel (for example, in a VTS controlled area) or working with other vessels (for example, for towage).

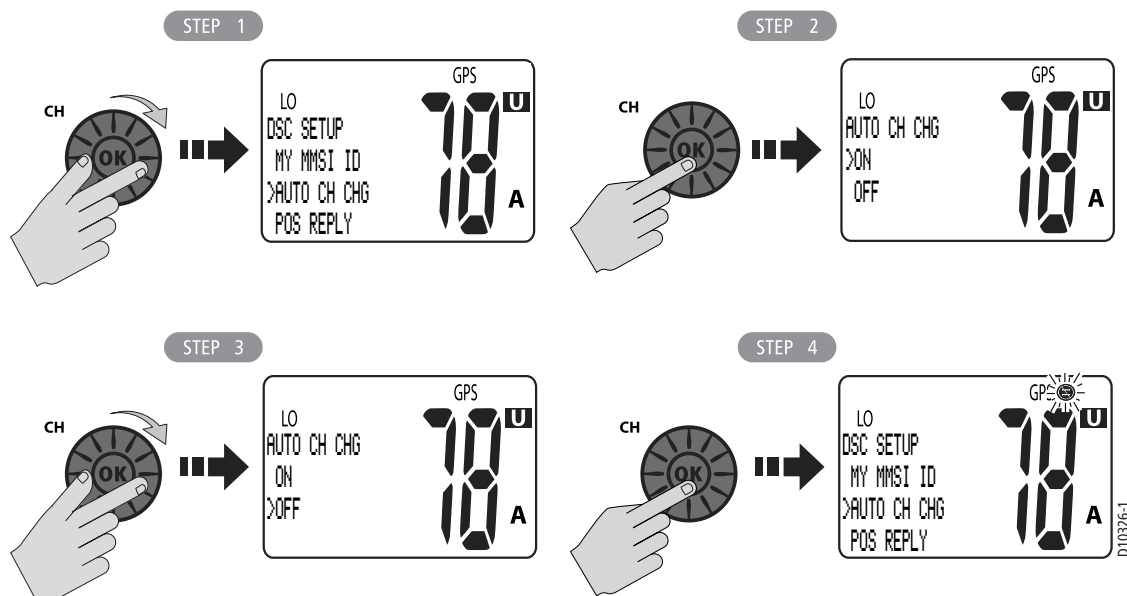
**Note:** *This feature can disable automatic channel switching for incoming DSC Distress and All Ships Urgency Calls. If enabled, you are responsible for determining whether manually declining the call is appropriate.*

### To enable/disable automatic channel change:

1. From DSC SETUP, rotate the **CH/OK** knob until the arrow points to AUTO CH CHG.
2. Press the **CH/OK** knob to accept.
3. Rotate the **CH/OK** knob until the arrow points to your selection:
  - If you accept ON (the default), your Ray49 automatically changes to channel 16 when a Distress or All Ships Urgency Call is received.
  - If you accept OFF, on receipt of a Distress or All Ships Urgency Call you are presented with brief details of the call and advised that a change to channel 16 has been requested. You can either accept the channel change or decline, thereby continuing to monitor your current channel. When set OFF, the  icon appears on the LCD.

If you accept the request, the call is received, a tone sounds and the radio is changed to channel 16. Pressing any key disables the alarm. If you ignore the call, after 5 minutes the radio declines the call, records the call in the Call Log and maintains normal operation.

4. Press **CH/OK** to accept.



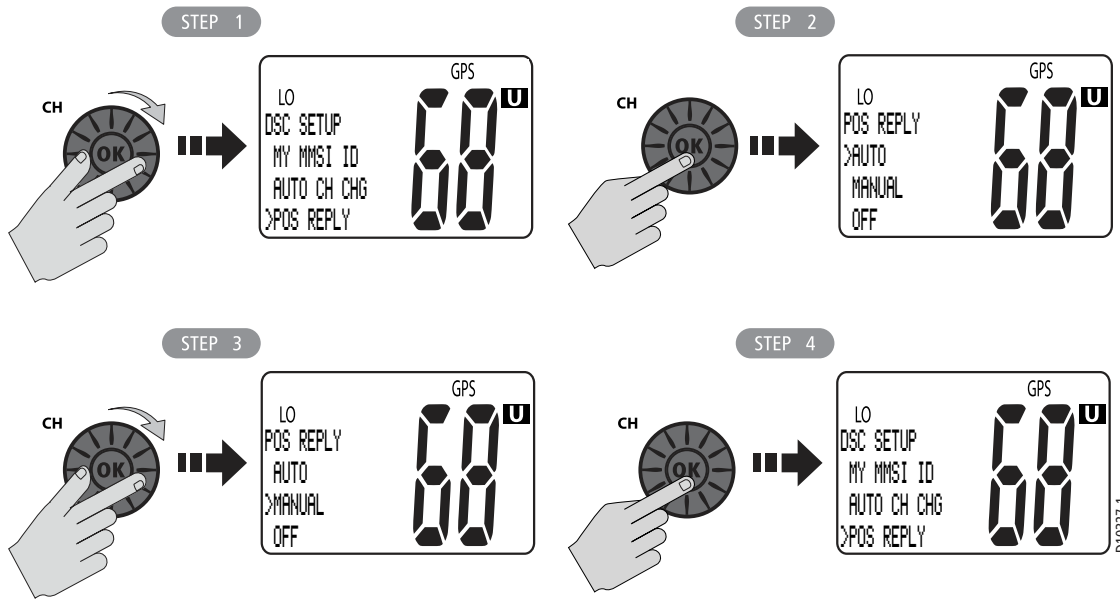
## Position Reply

This option enables you to determine how your radio responds to a request for your GPS position information (lat/lon) from another station.

### To enable/disable Position Reply:

1. From DSC SETUP, rotate the **CH/OK** knob until the arrow points to POS REPLY.
2. Press the **CH/OK** knob to accept.
3. Rotate the **CH/OK** knob until the arrow points to your selection:
  - AUTO sends out your vessel's position data as soon as it is requested.
  - MANUAL sends out the data only after you respond to the request.
  - OFF will not send position data under any circumstances, nor notify you that the request has been made.
4. Press **CH/OK** to accept.

The default setting is MANUAL, which is described in "Position Request" on page 77.



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# Chapter 6: Customer Service

This chapter provides information on service for your Ray49.

## 6.1 How to Contact Raymarine

### On the Internet

Visit the Raymarine World Wide Web site for the latest information on Raymarine electronic equipment and systems at:

[www.raymarine.com](http://www.raymarine.com)

### Customer Support

Navigate to the Customer Support page for links for:

- Finding Factory Service locations and Authorized Dealers near you
- Registering your Raymarine products
- Accessing handbooks in Adobe Acrobat format
- Downloading RayTech software updates
- Accessing the Raymarine solution database

Clicking the Find Answers link routes you to our solution database. Search questions and answers by product, category, keywords, or phrases. If the answer you are seeking is not available, click the Ask Raymarine tab to submit your own question to our technical support staff, who will reply to you by e-mail.

### Product Repair and Service

In the unlikely event your Raymarine unit should develop a problem, please contact your authorized Raymarine dealer/distributor for assistance. The dealer is best equipped to handle your service requirements and can offer timesaving help in getting the equipment back into normal operation.

In the event that repairs can not be obtained conveniently, product service may also be obtained by returning the unit to:

Raymarine, Inc.  
Product Repair Center  
21 Manchester Street  
Merrimack, NH 03054-4801

The Product Repair Center is open Monday through Friday 8:15 a.m. to 5:00 p.m. Eastern Time. All products returned to the Repair Center are registered upon receipt. Should you wish to inquire about the repair status of your unit, contact the Product Repair Center at:

603-881-5200 ext. 2118

Please have the product reference number, or unit serial number, ready when you call. We will do everything possible to repair and return your unit quickly.

## **Accessories and Parts**

Many Raymarine accessory items and parts can be obtained directly from your authorized Raymarine dealer.

However, if you are in need of an item not available from the retailer, please contact Raymarine Technical Services at:

603-881-5200 ext. 2333

Please have the Raymarine item or part number ready when calling if placing an order. If you are not sure which item is appropriate for your unit, you should first contact the Technical Support Department to verify your requirements.

## **Technical Support**

For technical support, call:

603-881-5200 ext. 2444

Our Technical Support Specialists are available to answer questions about installing, operating and trouble-shooting all Raymarine products. Technical Service is available Monday through Friday 8:00 AM to 6:00 PM Eastern Time.

Questions can be sent directly to our Technical Support Department via the Internet. Point your browser to [www.raymarine.com](http://www.raymarine.com) and click on the Customer Support link. From there, select Find Answers and click the Ask Raymarine tab.



# Appendix A: Specifications

## General

Mounting	Bracket or flush mount	
Size (H x W x D): Ray49		
Flush Mounted	2.87 x 6.57 x 6.89in (73 x 167 x 175mm)	
Bracket Mounted	3.56 x 7.05 x 6.89in (90.3 x 179 x 175mm)	
Weight, Ray49: Transceiver & Microphone	2.5 lbs (1.13 kg)	
Power	12 VDC system (13.6 VDC, typical)	
Environmental: Operating Range Storage Range Humidity	Waterproof to IPX7 -10°C to +50°C -20°C to +70°C up to 95%	
Frequency Range: Transmit: Receive	156.050 to 157.425 MHz 156.050 to 163.275 MHz	
Oscillate Mode	PLL	
Modulation	FM (16K0G3E) DSC (16K0G2B)	
Channel Spacing	25 kHz Increments	
Frequency Stability	+/- 10 PPM (+/- 0.001%)	
Audio Output Power	3.5 watts, typical (at 10% distortion with 4 ohm load), 5 watts peak.	
Antenna Port Impedance	50 ohms, typical	
NMEA Port Impedance	100 ohms	
External Speaker Impedance	4 ohms	
NMEA IN Sentences supported (NMEA 0183 ver. 3.01):	GLL	Geographic position, Latitude/Longitude
	GGA	GPS fix data
	RMA	Recommended minimum data for LORAN
	RMC	Recommended minimum data for GPS
	GNS	GNSS fix data
NMEA OUT Sentences (NMEA 0183 ver. 3.01):	DSC	DSC data
	DSE	Extended DSC data

## Transmitter

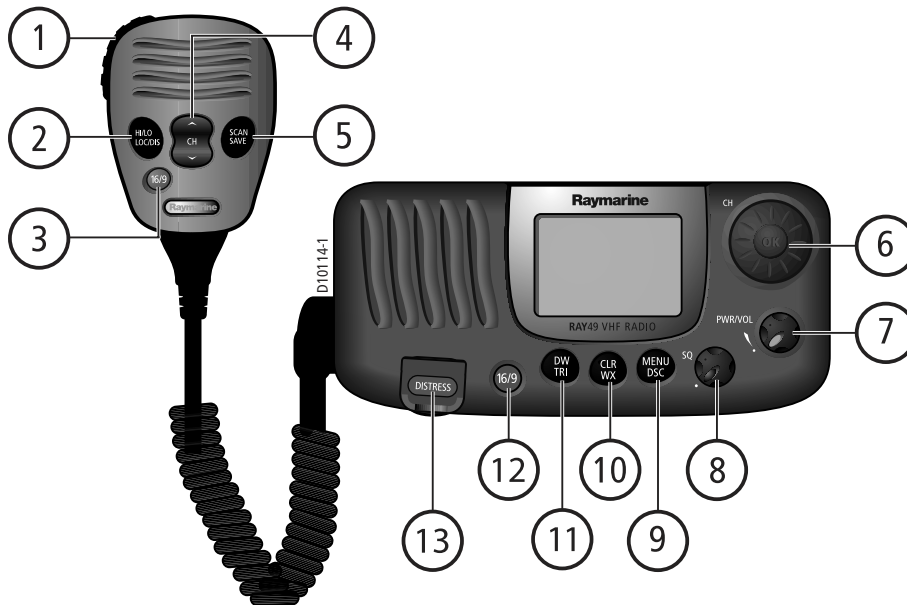
Frequency Error	10 ppm
RF Power (at 13.6 VDC):	
Hi Mode	25 W
Lo Mode	1 W
Maximum Deviation	$\pm 5$ KHz
FM Hum and Noise Level	less than -40 dB below audio level
Audio Distortion	less than 10%
Adjacent Channel Power	more than 70 dB
Spurious/Harmonic Emissions	less than -70 dBc
Current Drain:	
Hi Power at 13.6V DC	less than 6 A

## Receiver

Sensitivity @ 12db SINAD	0.28 $\mu$ V, typical
Hum and Noise	less than -40 dB below audio level
Audio Distortion	less than 10%
Adjacent Channel Rejection	more than 70 dB, typical
Intermodulation Rejection Ratio	more than 68 dB, typical
Spurious Image Rejection	more than 70 dB, typical
Squelch Sensitivity @ 12db SINAD	
at tight	less than 1 $\mu$ V,
at threshold	less than 0.28 $\mu$ V

# Appendix B: Radio Controls

This section is a quick reference to your radio's controls.



## Microphone Keys

Key Name	Press & Release	Press & Hold 3 seconds
1. PTT	Push-to-Talk	Push-to-Talk
2. HI/LO LOC/DIS	TX Power High/Low and ACCEPT key for menu item selections	Toggles between full receiver sensitivity (Distant mode) and attenuated receiver sensitivity (Local mode).
3. 16/9	Switch between the Priority and Working Channels	Switch to Secondary Priority CH (9); If already tuned to secondary channel, program a new secondary Priority Channel.
4. UP/DOWN	Channel changing and navigating menu item selections	Rapid channel change and navigating menu item selections
5. SCAN/ SAVE	Initiate Priority Saved Scan mode or terminate any active scan.	SAVE/DELETE channel to/from memory

## Transceiver Controls

Key Name	Function
6. CH/OK	Rotate to change channels or navigate menu items. Press to accept menu item selections.
7. PWR/VOL	Power radio ON / OFF and adjust volume level
8. SQ	Adjust squelch threshold level

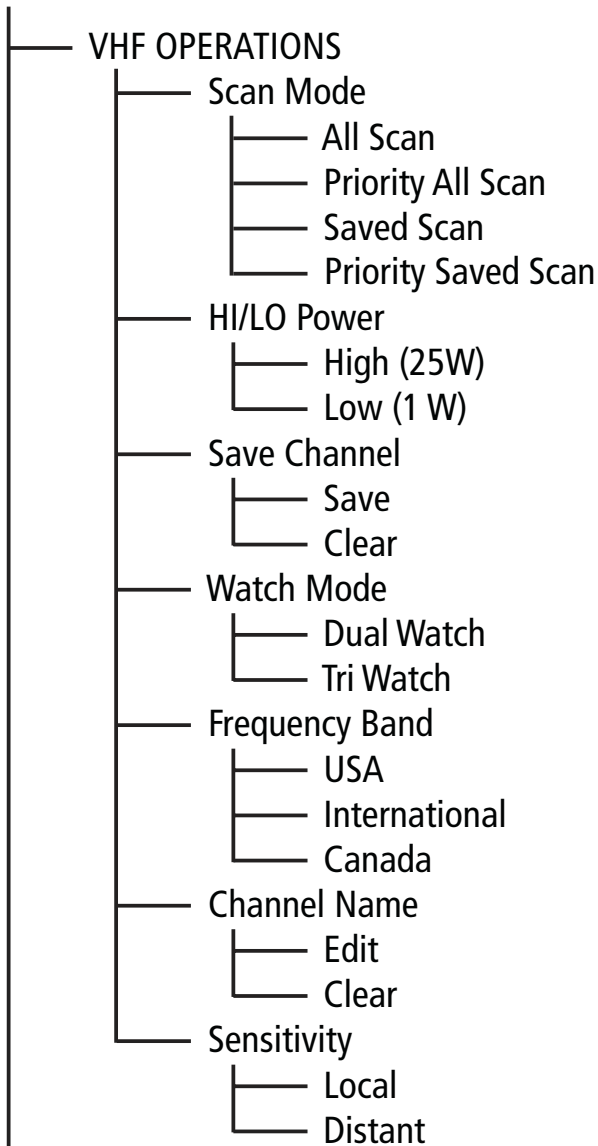
## Transceiver Push Keys

Key Name	Press & Release	Press & Hold 3 seconds
9. MENU/DSC	Activate Menu functions	Activate DSC functions
10. CLR/WX	Cancel function	Weather Channel Mode
11. DW/TRI	Activate Dual Watch	Activate Tri Watch
12. 16/9	Switch between the Priority and Working Channels	Switch to secondary Priority CH (9); If already tuned to secondary channel, program a new secondary Priority Channel.
13. DISTRESS	Designate Distress Type	Make Distress Call

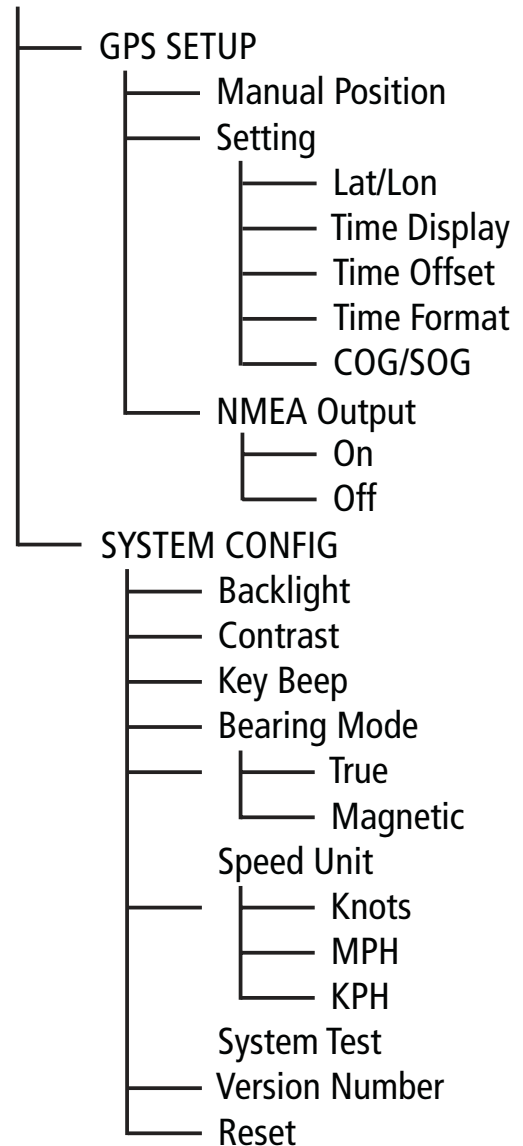
# Appendix C: Menu Structure

Following is the structure of the menu that appears when the **MENU/DSC** key is pressed and then immediately released.

## MENU



## MENU (continued)

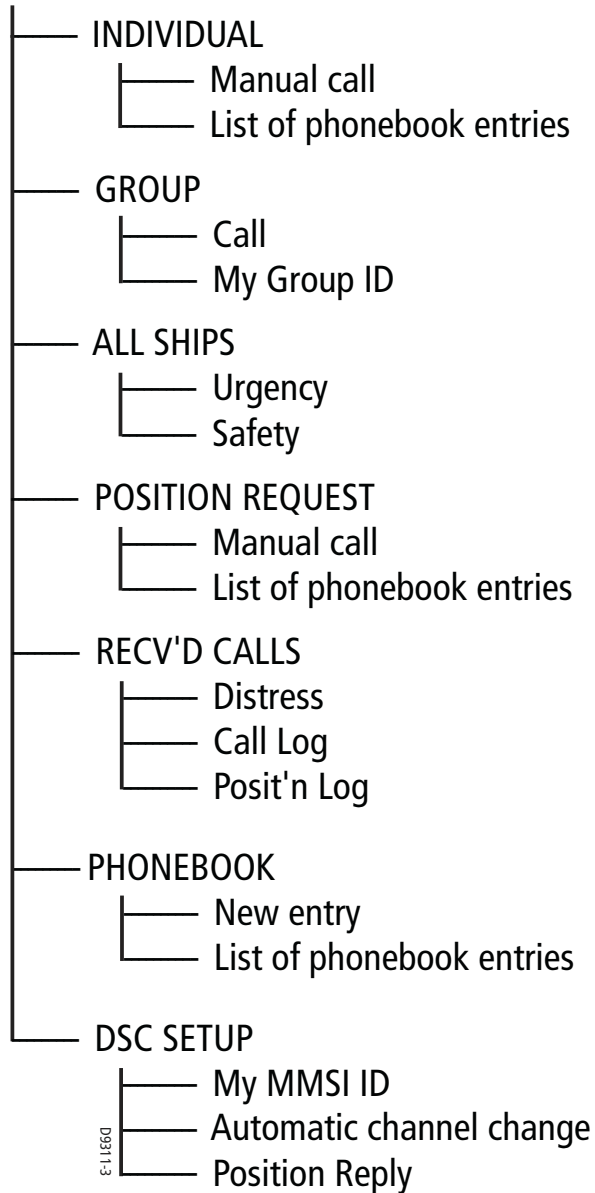


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(continued in next column)

Following is the structure of the menu that appears when the **MENU/DSC** key is pressed and held for 3 seconds.

## DSC



# Appendix D: Channel List

## U.S. Marine VHF Channels and Frequencies

CH. No	XMIT Freq	RCV Freq	Single Freq	Use
01A	156.050	156.050	x	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area. <sup>1</sup>
03A	156.150	156.150	x	U.S. Government only
05A	156.250	156.250	x	Port Operations or VTS in the Houston, New Orleans and Seattle areas.
06	156.300	156.300	x	Intership Safety
07A	156.350	156.350	x	Commercial
08	156.400	156.400	x	Commercial (Intership only)
09	156.450	156.450	x	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	x	Commercial
11	156.550	156.550	x	Commercial. VTS in selected areas.
12	156.600	156.600	x	Port Operations. VTS in selected areas.
13	156.650	156.650	x	Intership Navigation Safety (Bridge-to-bridge). Ships >20meters in length maintain a listening watch on this channel in US waters. <sup>2,6</sup>
14	156.700	156.700	x	Port Operations. VTS in selected areas.
15	–	156.750	x	Environmental (Receive only). Used by Class 'C' EPIRBs. <sup>3</sup>
16	156.800	156.800	x	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel. <sup>4</sup>
17	156.850	156.850	x	State Control <sup>5</sup>
18A	156.900	156.900	x	Commercial
19A	156.950	156.950	x	Commercial
20	157.000	161.600		Port Operations (duplex)
20A	157.000	157.000	x	Port Operations

<b>CH. No</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Single Freq</b>	<b>Use</b>
21A	157.050	157.050	x	U.S. Coast Guard only
22A	157.100	157.100	x	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
23A	157.150	157.150	x	U.S. Coast Guard only
24	157.200	161.800		Public Correspondence (Marine Operator)
25	157.250	161.850		Public Correspondence (Marine Operator)
26	157.300	161.900		Public Correspondence (Marine Operator)
27	157.350	161.950		Public Correspondence (Marine Operator)
28	157.400	162.000		Public Correspondence (Marine Operator)
61A	156.075	156.075	x	U.S. Government only
63A	156.175	156.175	x	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
64A	156.225	156.225	x	U.S. Coast Guard only
65A	156.275	156.275	x	Port Operations
66A	156.325	156.325	x	Port Operations
67	156.375	156.375	x	Commercial. Used for Bridge-to-bridge communications in lower Mississippi River. Intership only. <sup>6</sup>
68	156.425	156.425	x	Non-Commercial
69	156.475	156.475	x	Non-Commercial
71	156.575	156.575	x	Non-Commercial
72	156.625	156.625	x	Non-Commercial (Intership only)
73	156.675	156.675	x	Port Operations
74	156.725	156.725	x	Port Operations
77	156.875	156.875	x	Port Operations (Intership only) <sup>5</sup>
78A	156.925	156.925	x	Non-Commercial
79A	156.975	156.975	x	Commercial. Non-Commercial in Great Lakes only.



<b>CH. No</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Single Freq</b>	<b>Use</b>
80A	157.025	157.025	x	Commercial. Non-Commercial in Great Lakes only
81A	157.075	157.075	x	U.S. Government only – Environmental protection operations.
82A	157.125	157.125	x	U.S. Government only
83A	157.175	157.175	x	U.S. Coast Guard only
84	157.225	161.825		Public Correspondence (Marine Operator)
85	157.275	161.875		Public Correspondence (Marine Operator)
86	157.325	161.925		Public Correspondence (Marine Operator)
87	157.375	161.975		Public Correspondence Marine Operator)
88	157.425	162.025		Public Correspondence only near Canadian border
88A	157.425	157.425	x	Commercial, Intership only

- Recreational boaters normally use channels listed as Non-Commercial: 68, 69, 71, 72, 78A.
- Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.
- Channels 75 and 76 are reserved as guard bands for Channel 16 and are not available for regular voice communications.

### **Notes:**

1. *The letter "A" following a channel number indicates 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 meters or greater are required to guard VHF channel 13, in addition to VHF channel 16, when operating within U.S. territorial waters.*
3. *Channel is Receive Only.*
4. *Channel 16 is used for calling other stations or for distress alerting.*
5. *Output power is fixed at 1 watt only.*
6. *Output power is initially set to 1 watt. User can temporarily override this restriction to transmit at high power.*

## Canadian Marine VHF Channels and Frequencies

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Area of Operation</b>	<b>Use</b>
01	156.050	160.650	PC	Public Correspondence
02	156.100	160.700	PC	Public Correspondence
03	156.150	160.750	PC	Public Correspondence
04A	156.200	156.200	PC	Intership, Ship/Shore and Safety: Canadian Coast Guard search and rescue <sup>1</sup>
04A	156.200	156.200	EC	Intership, Ship/Shore and Commercial: Commercial fishing only
05A	156.250	156.250		Ship Movement
06	156.300	156.300	All areas	Intership, Commercial, Non-commercial and Safety: May be used for search and rescue communications between ships and aircraft.
07A	156.350	156.350	All areas	Intership, Ship/Shore, Commercial
08	156.400	156.400	WC, EC	Intership, Commercial and Safety: Also assigned for operations in the Lake Winnipeg area.
09	156.450	156.450	AC	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: May be used to communicate with aircraft and helicopters in predominantly maritime support operations.
10	156.500	156.500	AC, GL	Intership, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
11	156.550	156.550	PC, AC, GL	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: Also used for pilotage purposes.
12	156.600	156.600	WC, AC, GL	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: Port operations and pilot information and messages.
13	156.650	156.650	All areas	Intership, Commercial, Non-commercial and Ship Movement: Exclusively for bridge-to-bridge navigational traffic. Limited to 1-watt maximum power.

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Area of Operation</b>	<b>Use</b>
14	156.700	156.700	AC, GL	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: Port operations and pilot information and messages.
15	156.750	156.750	All areas	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: All operations limited to 1-watt maximum power. May also be used for on-board communications.
16	156.800	156.800	All areas	International Distress, Safety and Calling <sup>2</sup>
17	156.850	156.850	All areas	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement: All operations limited to 1-watt maximum power. May also be used for on-board communications.
18A	156.900	156.900	All areas	Intership, Ship/Shore and Commercial: Towing on the Pacific Coast.
19A	156.950	156.950	All areas except PC	Intership and Ship/Shore: Canadian Coast Guard only.
19A	156.950	156.950	PC	Intership and Ship/Shore: Various Government departments.
20	157.000	161.600	All areas	Ship/Shore, Safety and Ship Movement: Port operations only with 1-watt maximum power.
21A	157.050	157.050	All areas	Intership and Ship/Shore: Canadian Coast Guard only.
21B	-	161.650	All areas	Safety: Continuous Marine Broadcast (CMB) service. <sup>3</sup>
22A	157.100	157.100	All areas	Intership, Ship/Shore, Commercial and Non-commercial: For communications between Canadian Coast Guard and non-Canadian Coast Guard stations only.
23	157.150	161.750	PC	Ship/Shore and Public Correspondence: Also in the inland waters of British Columbia and the Yukon.
24	157.200	161.800	All areas	Ship/Shore and Public Correspondence
25	157.250	161.850	PC	Ship/Shore and Public Correspondence: Also assigned for operations in the Lake Winnipeg area.
25B	-	161.850	AC	Safety: Continuous Marine Broadcast (CMB) service.
26	157.300	161.900	All areas	Ship/Shore, Safety and Public Correspondence

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Area of Operation</b>	<b>Use</b>
27	157.350	161.950	AC, GL, PC	Ship/Shore and Public Correspondence
28	157.400	162.000	PC	Ship/Shore, Safety and Public Correspondence
28B	-	162.000	AC	Safety: Continuous Marine Broadcast (CMB) service.
60	156.025	160.625	PC	Ship/Shore and Public Correspondence
61A	156.075	156.075	PC	Intership and Ship/Shore: Canadian Coast Guard only.
61A	156.075	156.075	EC	Intership, Ship/Shore and Commercial: Commercial fishing only.
62A	156.125	156.125	PC	Intership and Ship/Shore: Canadian Coast Guard only.
62A	156.125	156.125	EC	Intership, Ship/Shore and Commercial: Commercial fishing only.
64	156.225	160.825	PC	Ship/Shore and Public Correspondence
64A	156.225	156.225	EC	Intership, Ship/Shore and Commercial: Commercial fishing only.
65A	156.275	156.275		Intership, Ship/Shore, Commercial, Non-commercial, Safety: Search & rescue and antipollution operations on the Great Lakes. Towing on the Pacific Coast. Port operations only in the St. Lawrence River areas with 1W maximum power. Pleasure craft in the inland waters of Alberta, Saskatchewan and Manitoba (excluding Lake Winnipeg and the Red River).
66A	156.325	156.325		Intership, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement: Port operations only in the St. Lawrence River/Great Lakes Areas with 1-watt maximum power.
67	156.375	156.375	EC	Intership, Ship/Shore and Commercial: Commercial fishing only.
67	156.375	156.375	All areas except EC	Intership, Ship/Shore, Commercial, Non-commercial, Safety: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Area of Operation</b>	<b>Use</b>
68	156.425	156.425	All areas	Intership, Ship/Shore and Non-commercial: For marinas and yacht clubs.
69	156.475	156.475	All areas except EC	Intership, Ship/Shore, Commercial and Non-commercial
69	156.475	156.475	EC	Intership, Ship/Shore and Commercial: Commercial fishing only.
71	156.575	156.575	PC	Intership, Ship/Shore, Commercial, Non-commercial, Safety and Ship Movement
71	156.575	156.575		Intership, Ship/Shore and Non-commercial: For marinas and yacht clubs on the East Coast and on Lake Winnipeg.
72	156.625	156.625	EC, PC	Intership, Commercial and Non-commercial: May be used to communicate with aircraft and helicopters in predominantly maritime support operations.
73	156.675	156.675	EC	Intership, Ship/Shore and Commercial: Commercial fishing only
73	156.675	156.675	All areas except EC	Intership, Ship/Shore, Commercial, Non-commercial, Safety: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollu- tion operations.
74	156.725	156.725	EC, PC	Intership, Ship/Shore, Commercial, Non-commercial and Ship Movement.
77	156.875	156.875		Intership, Ship/Shore, Safety and Ship Movement: Pilotage on Pacific Coast. Port operations only in the St. Lawrence River/Great Lakes areas with 1W maximum power.
78A	156.925	156.925	EC, PC	Intership, Ship/Shore and Commercial
79A	156.975	156.975	EC, PC	Intership, Ship/Shore and Commercial
80A	157.025	157.025	EC, PC	Intership, Ship/Shore and Commercial
81A	157.075	157.075		Intership and Ship/Shore: Canadian Coast Guard use only in the St. Lawrence River/Great Lakes areas.
81A	157.075	157.075	PC	Intership, Ship/Shore and Safety: Canadian Coast Guard antipollution.

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Area of Operation</b>	<b>Use</b>
82A	157.125	157.125	PC	Intership, Ship/Shore and Safety: Canadian Coast Guard use only.
82A	157.125	157.125		Intership and Ship/Shore: Canadian Coast Guard use only in the St. Lawrence River/Great Lakes areas.
83	157.175	161.775	PC	Ship/Shore and Safety: Canadian Coast Guard use only.
83A	157.175	157.175	EC	Intership and Ship/Shore: Canadian Coast Guard and other Government agencies.
83B	-	161.775	AC, GL	Safety: Continuous Marine Broadcast (CMB) Service.
84	157.225	161.825	PC	Ship/Shore and Public Correspondence
85	157.275	161.875	AC, GL, NL	Ship/Shore and Public Correspondence
86	157.325	161.925	PC	Ship/Shore and Public Correspondence
87	157.375	161.975	AC, GL, NL	Ship/Shore and Public Correspondence
88	157.425	162.025	AC, GL, NL	Ship/Shore and Public Correspondence

### Area of Operation

AC: Atlantic Coast, Gulf and St. Lawrence River up to and including Montreal

EC (East Coast): includes NL, AC, GL and Eastern Arctic areas

GL: Great Lakes (including St. Lawrence above Montreal)

NL: Newfoundland and Labrador

PC: Pacific Coast

WC (West Coast): Pacific Coast, Western Arctic and Athabasca-Mackenzie Watershed areas

All areas: includes East and West Coast areas

### Notes:

1. An "A" following a channel number indicates simplex use of the ship station transmit side of an international 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 alerting.
3. The letter "B" following a channel number indicates simplex use of the coast station transmit side of an international duplex channel. That is, the channel is Receive Only.
4. Channel 70 is used exclusively for Digital Selective Calling (DSC) and is not available for regular voice communications.
5. Channels 75 and 76 are reserved as guard bands for Channel 16 and are not available for regular voice communications.

## International Marine VHF Channels & Frequencies

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Single Freq</b>	<b>Use</b>
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	160.800		Public Correspondence, Port Operations and Ship Movement
05	156.250	160.850		Public Correspondence, Port Operations and Ship Movement
06	156.300	156.300	x	Intership <sup>1</sup>
07	156.350	160.950		Public Correspondence, Port Operations and Ship Movement
08	156.400	156.400	x	Intership
09	156.450	156.450	x	Intership, Port Operations and Ship Movement
10	156.500	156.500	x	Intership, Port Operations and Ship Movement <sup>2</sup>
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 Safety, Port Operations and Ship Movement <sup>3</sup>
14	156.700	156.700	x	Port Operations and Ship Movement
15	156.750	156.750	x	Intership and On-board Communications at 1W only <sup>4</sup>
16	156.800	156.800	x	Distress, Safety and Calling
17	156.850	156.850	x	Intership and On-board Communications at 1W only <sup>4</sup>
18	156.900	161.500		Public Correspondence, Port Operations and Ship Movement
19	156.950	161.550		Public Correspondence, Port Operations and Ship Movement
20	157.000	161.600		Public Correspondence, Port Operations and Ship Movement
21	157.050	161.650		Public Correspondence, Port Operations and Ship Movement
22	157.100	161.700		Public Correspondence, Port Operations and Ship Movement
23	157.150	161.750		Public Correspondence, Port Operations and Ship Movement
24	157.200	161.800		Public Correspondence, Port Operations and Ship Movement

<b>CH No.</b>	<b>XMIT Freq</b>	<b>RCV Freq</b>	<b>Single Freq</b>	<b>Use</b>
25	157.250	161.850		Public Correspondence, Port Operations and Ship Movement
26	157.300	161.900		Public Correspondence, Port Operations and Ship Movement
27	157.350	161.950		Public Correspondence, Port Operations and Ship Movement
28	157.400	162.000		Public Correspondence, Port Operations and Ship Movement
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		Public Correspondence, Port Operations and Ship Movement
66	156.325	160.925		Public Correspondence, Port Operations and Ship Movement
67	156.375	156.375	x	Intership, Port Operations and Ship Movement <sup>2</sup>
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
73	156.675	156.675	x	Intership <sup>2</sup>
74	156.725	156.725	x	Port operations and Ship movement
75	156.775	156.775	x	See Note 5
76	156.825	156.825	x	See Note 5
77	156.875	156.875	x	Intership
78	156.925	161.525		Public correspondence, Port Operations and Ship Movement
79	156.975	161.575		Public correspondence, Port Operations and Ship Movement
80	157.025	161.625		Public correspondence, Port Operations and Ship Movement
81	157.075	161.675		Public correspondence, Port Operations and Ship Movement



CH No.	XMIT Freq	RCV Freq	Single Freq	Use
82	157.125	161.725		Public correspondence, Port Operations and Ship Movement
83	157.175	161.775		Public correspondence, Port Operations and Ship Movement
84	157.225	161.825		Public correspondence, Port Operations and Ship Movement
85	157.275	161.875		Public correspondence, Port Operations and Ship Movement
86	157.325	161.925		Public correspondence, Port Operations and Ship Movement
87	157.375	157.375	x	Port Operations and Ship Movement
88	157.425	157.425	x	Port Operations and Ship Movement

- 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.

#### Notes:

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. Channels 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 communication only and all precautions should be taken to avoid harmful interference to channel 16. Transmit power is limited to 1 Watt.

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## WX Channels (North America only)

<b>Weather Channel</b>	<b>Frequency in MHz</b>
WX 1	162.550
WX 2	162.400
WX 3	162.475
WX 4	162.425
WX 5	162.450
WX 6	162.500
WX 7	162.525
WX 8	161.650
WX 9	161.775
WX 10	163.275

## Appendix E: Glossary

<b>Term</b>	<b>Meaning</b>
All Scan	A feature that scans all channels in the channel set.
All Ships Call	A DSC call that sends out a message to all vessels within range. The Ray49 can make two different types of All Ships calls: Safety Calls for advisory alerts or Urgency Calls when assistance is required but there is no imminent danger to the vessel.
Canadian Channels	Channel designations as defined by Industry Canada.
CH	Channel selection key
COG	Course Over Ground
Distress Call	A DSC call notifying other ships and shore stations that your vessel is in imminent danger, sending your position and time information, along with (optionally) the nature of your distress situation.
DSC	Digital Selective Calling (DSC) is a system used to send digital messages to stations identified by a unique MMSI number. Contained within the message is the working channel on which voice communications are to be made. DSC enables you to make digital Distress Calls and to specify the stations that you wish to contact: an Individual station, all stations within a specified Group, or All Ship stations within range.
Dual Watch	A feature that monitors the Priority Channel 16 and one other channel that you choose.
FCC	Federal Communications Commission (US)
Global Positioning System	A navigational system that uses satellite signals to determine the latitude and longitude of a receiver on Earth.
GPS	Global Positioning System
Group Call	A DSC call that sends transmissions only received by radios sharing a common Group MMSI number, such as a flotilla or racing fleet.
Individual Call	A DSC Call made to a specific station identified by its MMSI number.
International Channels	Channel designations as defined by the ITU
ITU	International Telecommunications Union (EU)

<b>Term</b>	<b>Meaning</b>
MMSI	Maritime Mobile Service Identity; a number issued by each country to identify maritime stations, much like a telephone number.
NOAA	National Oceanographic and Atmospheric Administration (US)
Position Request	A DSC call requesting GPS position information from any station for which an MMSI number is known. You can also send out your position to other stations.
Priority Channel	Channel 16 or 9
Priority Scan	A feature that alternates monitoring the Priority Channel 16 with each of the regular channels.
PTT switch	Microphone push-to-talk switch
RF	Radio Frequency
RX	Receive
SAR	Search And Rescue
Saved Scan	Scans only user-selected memory channels
Semi-duplex	Channels using separate frequencies to transmit and receive.
Simplex	Channels transmitting and receiving on the same frequency.
SOG	Speed Over Ground
Squelch	A circuit that sets the threshold for cutting off the receiver when the signal is too weak for reception of anything but noise.
TX	Transmit
Tri Watch	A function that monitors the Priority Channel (16), the Secondary Priority Channel, and one other channel that you choose.
USA Channels	Channel designations as defined by the FCC
VOL	Volume key
VHF	Very High Frequency (30MHz to 300MHz)
Weather (WX) Channels	Channels for routine and emergency weather information broadcast by NOAA (USA)
WX	Weather Band key
Working Channel	The currently-selected (non-priority, non-WX) channel

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