



# LVR-850

## DSC VHF Marine Radio

# Installation and Operation Instructions

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## **FCC Radio License and MMSI Number Information**

In U.S. waters, vessels which are not required to carry radio equipment are not required to have an FCC (Federal Communications Commission) ship station license for a VHF marine radio.

However, any vessel required to carry a marine radio on an international voyage, carrying a HF single side band radio telephone or marine satellite terminal must have an FCC license.

License application forms for ship and land stations can be downloaded free from the FCC web site at this address: [www.fcc.gov/formpage.html](http://www.fcc.gov/formpage.html). You may also order copies of these forms by calling the FCC Forms Distribution Center at 1-800-418-3676.

At this time, the FCC does not require recreational boaters to have a ship radio station call sign. The U.S. Coast Guard recommends using the boat's registration number and state.

The BoatU.S. MMSI Program has been certified by both the Federal Communications Commission (FCC) and the U.S. Coast Guard to assign MMSI numbers to vessels with DSC capable radios. To obtain and register your free MMSI number, the Coast Guard recommends logging onto <http://www.boatus.com/mmsi/> and following the instructions.

## FCC Digital Device Compliance

This device complies with Part 15 of the U.S. Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### **Note:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the factory customer service department for help.

# FCC Radio Frequency Compliance Requirements and Warnings

When operating your marine radio transceiver, you should know that the antenna radiates radio frequency (RF) energy. This radio was designed to meet the FCC's rules and regulations for the maximum permissible exposure to radio frequency energy. This design was tested and found to be compliant with the strict requirements established by the FCC.

**DO NOT** operate the radio without a proper antenna attached, because this may damage the radio and may also cause you to exceed FCC RF exposure limits. Antenna types suited for this radio are described in the installation section.

**DO NOT** transmit for more than 50% of the total radio use time. Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. The radio is transmitting when the "TX indicator" is displayed on the screen. You can cause the radio to transmit by pressing the "PTT" (Push To Talk) switch.

**IMPORTANT:** The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 91 cm (37 inches) from all persons (including passengers). The antenna(s) must not exceed an antenna gain of 3 decibels (dB) and must not be co-located or operating in conjunction with any other antenna or transmitter.

# Section 1: Installation

## Introduction

Thank you for purchasing the Lowrance LVR 850 DSC VHF Radio. We know you're anxious to try it out, but first, let us explain how this manual can help you get the most out of your new radio.

We have designed this book so you don't have to read the whole thing from front to back to find the information you want. At the start of each segment, we'll tell you what content is coming up next. If it's a concept you're already familiar with, we'll show you where to find the next important topic.

We lead off the manual with proper Distress Call procedures on page 4. We put it at the front of the book to make it easy to find in case of an emergency.

The first section covers LVR-850 installation and specifications.

The second section, Basic Radio Operation, goes over some basic functions of the radio and includes instructions on how to set up your MMSI (Maritime Mobile Service Identity) number. **You can't make a call without it! To jump to MMSI setup, flip to page 8. To acquire a free MMSI number, see the web address on the bottom of page ii.**

The third section, Advanced Radio Operation, offers more detailed information about the radio's features. The section will touch on all aspects of the radio's functionality, providing clear and complete explanations via a convenient alphabetical layout.

Let's get started!

## Powering Your Radio

### (Power Supply cable – red and black wires)

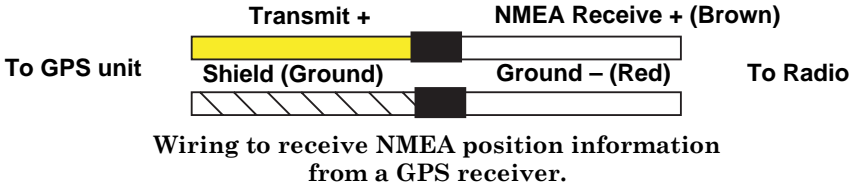
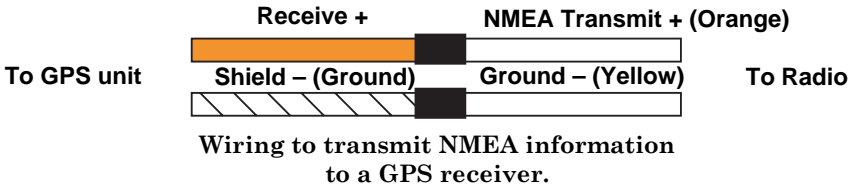
The unit works from a 12-volt electrical system. You may attach the radio to a 12-volt battery or to an auxiliary power panel.

If possible, keep the power cable away from other boat wiring, especially the engine's wires. This will provide the best isolation from electrical noise. The power cable has two wires, red and black. Red is the positive lead, black is negative or ground. Make sure to attach the in-line fuse holder to the red lead *as close to the power source as possible*.

## Auxiliary Wires

The white and black auxiliary wires on the back of the unit connect your radio to an external speaker. Connect the white (+) wire to the speaker's positive lead, and connect the black (-) wire to the speaker's negative lead.

The remaining auxiliary wires are used for DSC (Digital Selective Calling) service, where the radio can exchange latitude and longitude position information with a GPS (Global Positioning System) receiver in NMEA 0183 format.



**Caution**

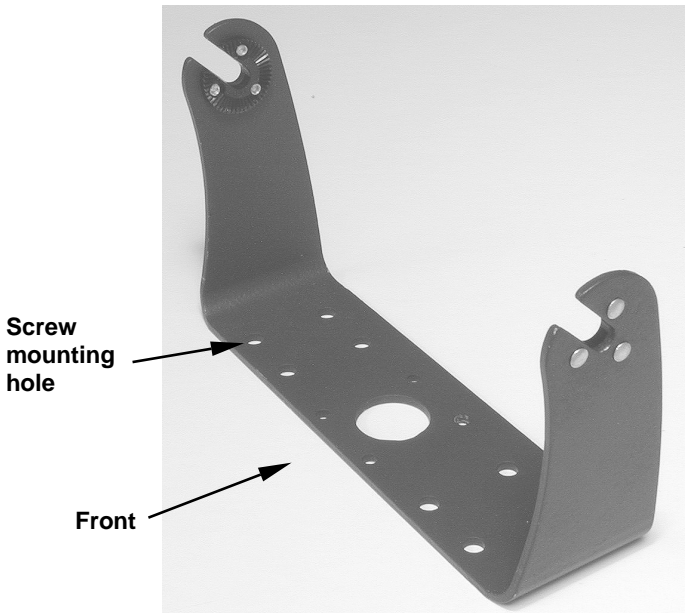
*All of the auxiliary wires have bare ends for easier installation. The bare ends on any unused wires could cause an electrical short if left exposed. To prevent this, you should cover the individual wire ends – either by capping them with wire nuts or wrapping them with electrical tape.*

**Bracket Installation**

Mount the unit in any convenient location, provided there is clearance behind the unit when it's tilted for the best viewing angle. You should also make sure there is enough room behind the unit to attach the power, antenna and auxiliary cables. Pick a location far enough from any compass to avoid compass deviation caused by the speaker magnet. The radio must be installed at least three feet from the antenna. Make sure there is space nearby to hang the mic clip.

Holes in the gimbal bracket's base allow wood screw or through-bolt mounting. You may need to place a piece of plywood on the back side of thin fiberglass panels to reinforce the panel and secure the mounting hardware. We suggest that you use stainless steel screws for installation.





**Install the gimbal bracket, which looks similar to the one pictured here. Place the bracket so the arms slope toward the radio's front.**

Once a location is determined, use the bracket as a template and mark the mounting holes. Screw the bracket to the mounting surface. Be sure to leave enough slack in the cables to allow tilting the unit.

Attach the unit to the gimbal bracket using the supplied gimbal knobs and washers. Attach the cables and the unit is ready to use.

## **Antenna**

A good antenna installation will optimize the performance of your marine radio. There is no height requirement for antenna installation, but the higher it is mounted, the better the reception. That's because marine VHF radio signals travel only on a "line of sight" basis. An ideal installation will give the antenna a clear view of the horizon in all directions.

The antenna may be mounted on a gunwale, rail or on flat surfaces like a deck, roof or bulkhead. In the case of some sailboats and powerboats, it may be attached to a mast or mast-like structure.

When installing your VHF marine antenna, be sure to keep it at least three feet away from any other antenna or metal object. The antenna also must be installed three feet away from the radio, and at least three feet from any passengers or crew. Refer to the antenna manufacturer's instructions for further installation information. You must also make

sure your antenna and its installation complies with all local and federal regulations. Never operate your radio unless it is connected to the antenna.

The antenna must not exceed an antenna gain of 3 decibels (dB). The antenna cable requires a PL259 connector, and the cable connects at the back of the radio. For installations less than 25 feet, use RG58 coaxial cable. For installations greater than 25 feet, use RG-8/U coaxial cable.

#### **WARNINGS:**

**Using an antenna with gain greater than 3 dB can damage the radio and exceed the safe exposure limits for radio frequency (RF) energy.**

**Also, the energy from any VHF radio antenna can be harmful, even one properly rated at 3 dB of gain! Do not come in contact with the antenna while a transmission is being sent. Be sure the antenna is installed where it is separated from people by at least 3 feet of space.**

### **How to Make a Distress Call**

**Speak slowly, clearly and calmly.**

1. Select VHF Channel 16.
2. Press microphone button: **"MAYDAY — MAYDAY— MAYDAY."**
3. **"THIS IS [your ship ID]."**
4. **"MAYDAY [your ship name]."**
5. Tell where you are — what navigational aids or landmarks are near.
6. State the nature of your distress.
7. Give number of persons aboard and condition of any injured.
8. Estimate present seaworthiness of your ship.
9. Briefly describe your ship — meters, type, color, hull.
10. **"I WILL BE LISTENING ON CHANNEL 16."**
11. End message by saying **"THIS IS [ship name/call sign] OVER."**
12. Release the PTT key and listen. Someone should answer. If not, repeat call, beginning at Item 3 above.

#### **WARNING**

**The following types of communication are prohibited by the FCC: false distress calls; calls to any boat — excluding emergencies and radio tests; calls to or from a vessel on land and obscene or profane language. Using obscene or profane language could result in a fine of up to \$10,000.**

## Section 2: Basic Radio Operation

This section addresses the radio's basic operations, which includes MMSI (Maritime Mobile Service Identity) number setup. If you already have your MMSI number programmed into the radio and have a strong understanding of the radio's basic functions, move on to **Section 3: Advanced Radio Operation**.



**The Lowrance LVR-850 VHF Marine Radio.**

We're going to kick off the operation section with a brief description of the radio's basic functions. That will be followed by some important information on Digital Selective Calling and basic instructions on how to make and receive calls.

### Using the Keypad

The keypad has eight keys: **H/L** (Hi/Lo), **WX** (Weather), **16/9** (Priority Channels), **SCN** (Scan), **MEM** (Memory), **CALL** (Call) and  $\uparrow \downarrow$ , the up-and-down arrow keys. When you press any of the keys a tone will sound. If you push a key and a 3-beep tone sounds, there is an error or the function is not supported by the radio. You'll notice several functions require you to hold down a key for a few seconds. In those cases, a single beep sounds, then, after a few moments, a second beep will be heard to let you know you have successfully changed the mode.

## Power/Volume

The volume knob at the top right of the radio's face is used to power up the LVR 850. Turn the knob clockwise to turn on the radio. The unit will start on Ch. 2, then switch to Ch. 16, its default priority channel.

## Squelch

Squelch, the bottom knob on the radio's face, helps the unit screen out radio traffic resulting from signals that are too weak to transmit anything but noise. To adjust the squelch, turn it to the left until noise can be heard. Turn it back to the right until the noise is eliminated.

### Memory Annunciator

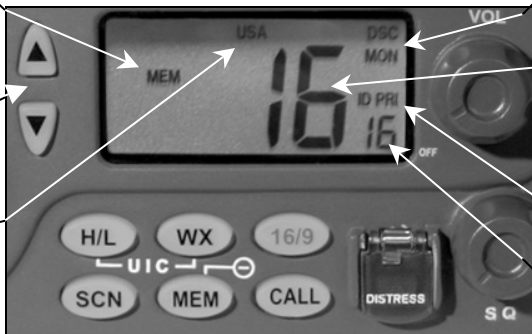
### DSC Monitor

### Arrow Keys

### Channel

### USA Channel Bank

### ID Annunciator



### Character field position

## H/L (High/Low)

The **H/L** key gives you control over the radio's wattage. The high-end is 25 Watts. The low-end is 1 Watt. If the **LO ANNUNCIATOR** is off, the radio will transmit at 25 Watts.

## WX (Weather)

Dark clouds on the horizon? Press the **WX** key to enter the **WX (WEATHER) MODE** and get the latest weather information. Use the **↑ ↓** keys to change the **WX** channel.

## 16/9 (Priority Channel)

The **16/9** key is used to switch between priority channels. It also allows you to exit various operation modes, ignore incoming calls and cancel outgoing calls.

## NOTE

Ch. 16 and Ch. 9 may only be used to make initial contact with a vessel and nothing more. When there is an emergency, all Distress calls will be broadcast on Ch. 16.

## SCN (Scan)

The **SCN** (scan) key allows you to monitor numerous channels at the same time. Scanning options include: **PRIORITY SCAN, MEMORY SCAN AND ALLSCAN.**

## **MEM (Memory)**

The **MEM** key may be used to initiate a Memory Scan and gives you the option of adding or deleting channels from the radio's scan list memory.

## **CALL**

By pressing the **CALL** key you can make a new call, return the last incoming call, place a call to all ships or to one of up to 10 stored MMSI numbers from a saved directory.

## **DISTRESS**

By lifting up the red cover and holding down the **DISTRESS** button for three seconds, you will send a distress call to the Coast Guard and any other ship within range of you.

## **Arrow Keys**

Use the ↑ ↓ keys to scroll through the channels and various menu options.

## **PTT (Press to Talk)**

The **PTT** key is the talk button on the microphone. Press and hold it down to talk when making or receiving a call.

## **DSC Calling vs. non-DSC Calling**

The LVR-850 supports two types of calls, Digital Selective Calls (DSC) and non-Digital Selective Calls. A non-DSC call is the traditional method where an individual hails another vessel on Ch. 16, then asks the other party to switch to a working channel set aside for the desired communication type. Once they have left Ch. 16 and the selected working channel is clear, the individual hails the vessel again to initiate communication.

## **What is a DSC call?**

A relatively new technology, digital selective calling (DSC) gives you the capability to dial another boat directly via the vessel's MMSI (Maritime Mobile Service Identity) number, which functions much like a phone number. Digital Selective Calling simplifies the calling process, because you don't have to hail the vessel on Ch. 16 nor do you have to verbally direct them to the working channel you want them to switch to for communication. When their DSC radio receives your call, it automatically will switch to the channel you selected for communication.

The primary reason DSC was created was to enhance boater safety. It does this in several ways. When working in tandem with a GPS unit, it helps the Coast Guard respond more quickly to a Distress Call, since the location of the vessel in distress will be automatically transmitted when the signal is sent out. It will automatically repeat a distress signal every four minutes. That would come in handy if, as in the case of a

fire, you could not man the radio and fight the fire at the same time. DSC calling also helps cut back the transmission traffic on Ch. 16, the emergency priority channel.

### **How DSC works**

A digital selective call uses a digital signal to transmit a pack of information that can include, the caller's MMSI number, the MMSI of the ship or ships being called, call priority and a frequency or mode request. Location and time of location may be entered manually or if an active GPS unit is attached, transmitted automatically. DSC calls allow you to contact a specific ship, a group of ships, a specific group of DSC receivers, ships in a particular geographic area or all ships within range of you. A DSC call may even be patched into a regular phone line through a commercial coastal station. One of the key elements of a DSC call is the ability to place an individual call directly to another vessel.

### **Simplex or Duplex**

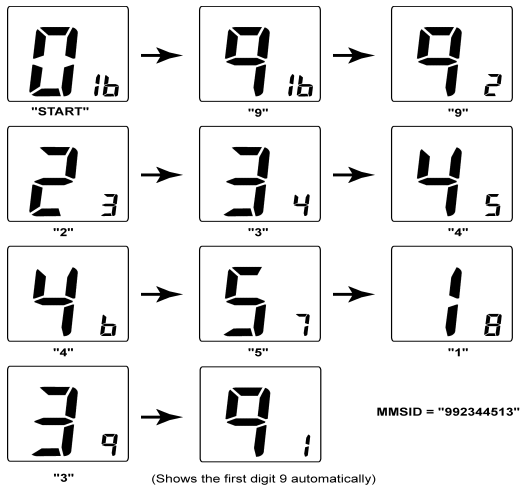
References to simplex and duplex channels are scattered throughout this manual. Simplex channels transmit and receive messages on the same frequency. Like a CB radio, only one message can be transmitted at a time. A duplex channel transmits and receives messages on different frequencies. Like a telephone, it gives users the capability to transmit and receive messages at the same time. **You must choose a simplex channel when making a DSC call!**

### **MMSI (Maritime Mobile Service Identity)**

Your Maritime Mobile Service Identity number (MMSI) is like a home phone number. Other DSC (Digital Selective Calling) radios must enter your number before they can contact you. But first, you must program your number into your radio. If your MMSI number is not set up, the **ID ANNUNCIATOR** will blink on the display.

### **CAUTION**

*You only have one chance to program your MMSI into your radio. Study this section carefully to ensure the MMSI is entered correctly.*



The figure above illustrates the MMSI number entry of 992344513.

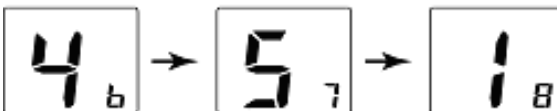
If a valid MMSI is already stored in the radio's memory, you will not be able to enter a MMSI number. If a 9-digit MMSI number has not been programmed into the radio, you will not be able to make or receive DSC calls. To enter your assigned MMSI number, follow the steps listed in the MMSI Setup below.

### Warning

Again, there is only one chance to do this procedure correctly, so go over this section carefully.

### MMSI Setup

1. Hold down the **CALL** key for 5 seconds. The **ID ANNUNCIATOR** will blink and a large "0" will be displayed alongside a small "16." The big number "0" is the MMSI digit you are entering and the small digit "16" is the first MMSI character field position. For example, a small digit "2" represents the 2nd number from the left in your assigned MMSI. If the number was "4" it would mean the big digit you were entering was the 4th number from the left and so on.



This example gives us a closer look at a number sequence from a MMSI entry. The big numbers are the MMSI digits. The small numbers in the lower right hand corner represent the digits' character field position. The big digit 4 is the sixth number from left in the MMSI. The big digit 5 is seventh from left and the big digit 1 is eighth from left.

## NOTE

You need only to modify the big (MMSI) digits. The small digits (character field position of the MMSI digit) will be generated automatically.

2. Use the  $\uparrow\downarrow$  keys to enter the first digit of your MMSI number, then press the **MEM** key to advance to the second digit. The small digit now displays the 2nd character position with a big-digit "0" and small-digit "2". Press the  $\uparrow\downarrow$  keys to set the second MMSI digit and touch the **MEM** key to store. Repeat the operation until all 9 digits have been entered. After inputting your MMSI, press the **MEM** key to double-check each digit.

## NOTE

If there is an error in the entry procedure, press the **16/9** key to exit.

You can also turn off the radio to ensure the MMSI won't be stored.

After you are satisfied with the MMSI number you have entered, hold down the **CALL** key for 5 seconds to store the number. The **ID ANNUNCIATOR** will stop blinking and the radio reverts to the main screen. Now you are ready to make a DSC call.

## Choosing a Channel

Before making a call to another vessel, check the VHF chart in the back of this manual. You'll have to choose a simplex communication channel authorized for the type of communication you desire.

## Making a Call

The LVR-850 supports five DSC call types: **ALLSHIPS CALL**, **DIRECTORY CALL**, **LAST CALL**, **NEW CALL** and **DISTRESS CALL**. The example below details a **NEW CALL**. For information on the other call types, see page 13.

### To place a DSC call

#### New Call

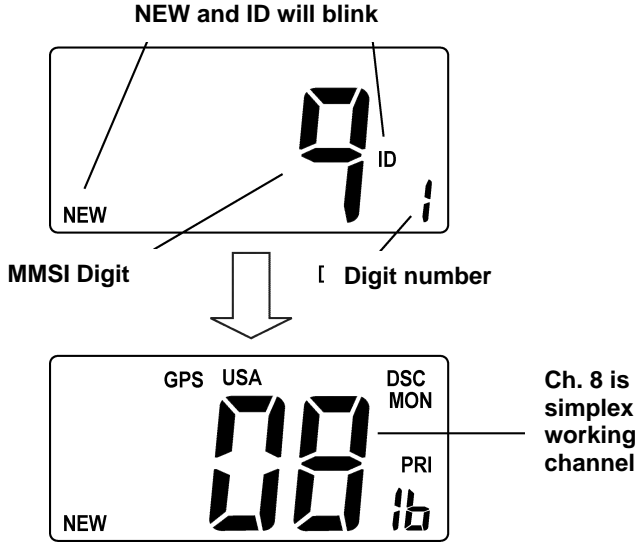
1. Select a simplex channel and press the **CALL** key once. **LAST** blinks.
2. Use the  $\uparrow\downarrow$  keys to select **NEW CALL**.
3. Press the **CALL** key again. You can now enter the MMSI data of the vessel you want to contact.
4. Use the  $\uparrow\downarrow$  keys to enter the MMSI numbers, pressing **MEM** after each digit. After completing MMSI entry, press the **MEM** key to verify each number of the MMSI.
5. Press the **CALL** key and the radio will transmit the request. If there is no **ACK** after 4 seconds, the radio transmits the call again. The radio will stay in standby mode until an **ACK** is received, indicated by the flashing ID Annunciator. If an **ACK** is not received, you can press the



call key again and the call is placed again. You can exit the call function at any time by pressing the **16/9** key twice.

**CAUTION**

Before transmitting, monitor the selected simplex channel to make sure it is clear. **This is a FCC requirement.**



For more in depth information on placing calls see page 13.

**To place a non-DSC call:**

When making a non-DSC call, you'll have to switch to a communication channel after making initial contact, so be sure to select a channel authorized for the type of communication you desire.

1. Select an appropriate communication channel.
2. Tune your radio to Ch. 16 or Ch. 9. Speak slowly and clearly, stating the name of the vessel you are trying to contact followed by "this is *(your ship name and call sign)*."
3. When the other vessel responds, say "go to *(the desired channel number)* over."
4. Switch to the other working channel. After you are sure it is clear, call out to the other vessel, stating the vessel's name, followed by "this is *(your ship name and call sign)*."

**Receiving a Call**

Reception of an individual call automatically establishes communication on the working channel requested by the caller. Your radio transmits an **ACK** (Acknowledgement) message back to the calling radio. If

the calling vessel's MMSI matches a number stored in your directory, the number's directory location is shown. If no match is made, the **ID ANNUNCIATOR** blinks. If you want to respond to the calling vessel, just press the **PTT** button on the microphone. Press the 16/9 key to ignore the call. See page 18 to get more detailed information on call reception.

# Section 3: Advanced Operation

This section will give a more detailed explanation of what your radio can do. We'll start off with a breakdown of the types of DSC calls the LVR-850 can transmit and receive. That will be followed by a brief description of how to place a non-DSC call. If you are comfortable with your knowledge regarding transmission and reception of calls, skip ahead to page 20 to see how to set up a MMSI Directory. On page 27, there is information on the radio's weather function.

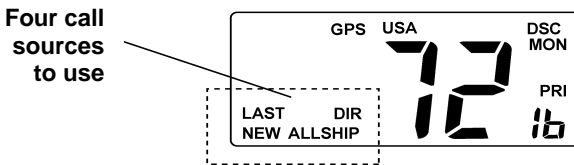
## Calls

### Transmission

The five DSC calling modes are:

1. **AllShips Call:** places a call to any ship in range of you.
2. **Directory Call:** dials number from MMSI directory.
3. **Distress Call:** executes an emergency call to Coast Guard and other ships in range of you.
3. **Last Call:** dials last incoming call.
4. **New Call:** places call to caller not in the MMSI directory.

Press **CALL** then use the  $\uparrow$   $\downarrow$  keys to scroll through the four choices (**DISTRESS CALL** is a separate function, so it is not included in the calls menu). The **LAST CALL** option always appears first.

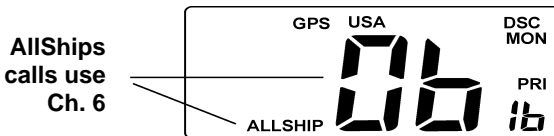


### AllShips Call

This feature gives you the option of placing a call to all ships within range of you.

### NOTE

This radio does not handle AllShips urgency or safety DSC calls.

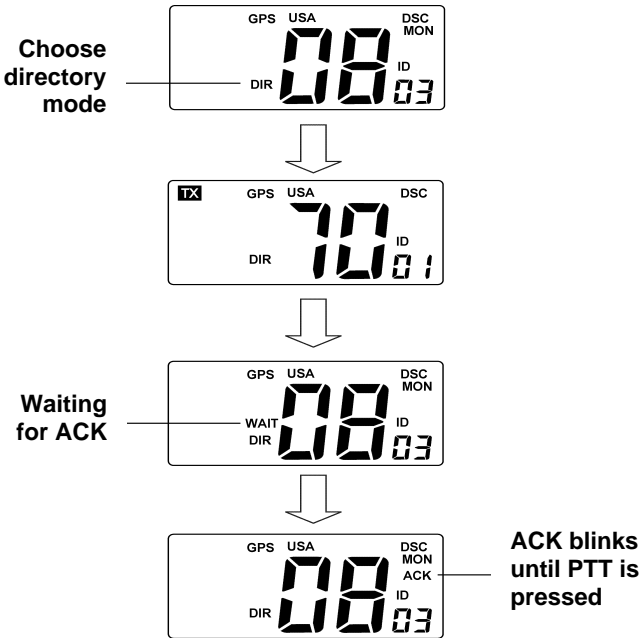


1. Press the **CALL** key.
2. Use the  $\uparrow$   $\downarrow$  keys to select **ALLSHIP**.
3. Press the **CALL** key to transmit.

### Directory Call

See page 20 to learn how to setup a MMSI directory. To call a number from your directory:

1. Use the  $\uparrow$   $\downarrow$  keys to select a simplex-working channel.
  2. Press the **CALL** key.
  3. Use the  $\uparrow$   $\downarrow$  keys to select the call type — **DIR**, **LAST**, **NEW** or **ALL-SHIPS**. Select **DIR**, then press **CALL**.
  4. Use the  $\uparrow$   $\downarrow$  keys to choose a MMSI location number (1-10). The default number is the MMSI of the last used call.
  5. Press the **CALL** key to transmit. The called radio will acknowledge and a communication link will be established. Just press **PTT** to talk.
- In the following example, Ch. 8 was used to call a MMSI stored in directory No. 3.



When the **ACK ANNUNCIATOR** turns on, the calling channel has been tuned in and a communication link established. Press **PTT** to talk.

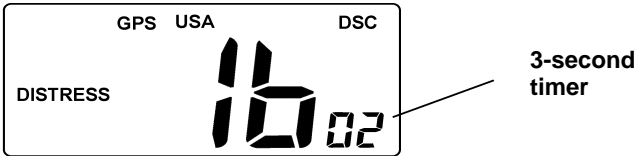
### Distress Call

In an emergency situation, lift the red cover on the front panel to make a Distress call to the Coast Guard. Press and hold the **DISTRESS** key for

three seconds. The radio switches to Ch. 16 and a three-second on screen timer begins to count down in the bottom right corner of the screen. When it reaches zero, the call is sent out. To stop the call, let go of the **DISTRESS** key. No message will be sent unless the timer counts down to zero. Press the **16/9** key to cancel.

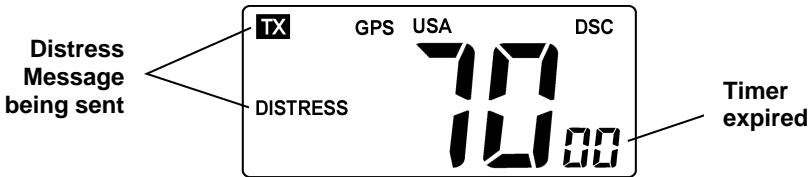
**NOTE**

If an inadvertent Distress call is sent out, make sure you're on Ch. 16 and quickly transmit a message to all vessels, canceling the Distress call.

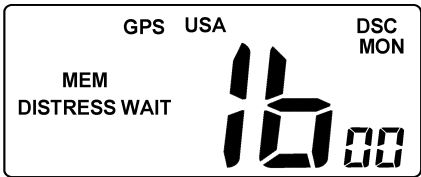


If the **DISTRESS** key is held down until the timer expires, the radio will switch to Ch. 70 and a distress call will be sent out. The DSC Distress message is transmitted at 25 watts.

The Distress message contains your MMSI, your position and the UTC time acquired from your GPS, if you're using a GPS unit. The **DISTRESS ANNUNCIATOR** is displayed during the transmission.



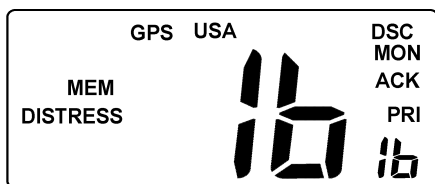
A loud 2-tone alarm sounds. This alarm cannot be stopped unless the mode is canceled. Pressing the **16/9** or **PTT** key cancels the **DISTRESS WAITING MODE**. If the mode is not canceled, the radio transmits the Distress message again every 4 minutes. A **DISTRESS WAIT** message will be displayed on the screen.



**NOTE**

The Coast Guard is the only agency allowed to acknowledge a Distress call. An individual vessel's DSC radio will not automatically respond with an acknowledgement.

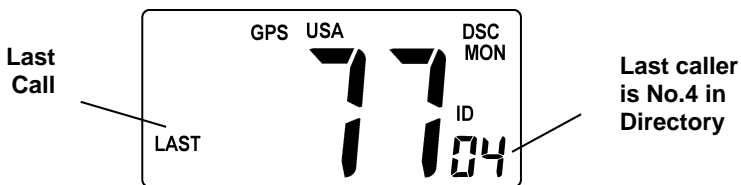
When an **ACK** is received, the distress mode is automatically canceled and communication will be on Ch. 16.



### Last Call

You can send a last call by following this sequence:

1. Use the  $\uparrow$   $\downarrow$  keys to select a simplex-working channel. The radio will default to Ch. 16 if a duplex channel is selected. (If you press the call key during **WX CHANNEL MODE**, the last used channel is displayed.)
2. Press the **CALL** key.
3. **LAST** blinks.



4. Press the **CALL** key to transmit.

If there is no last call information stored, an error beep sounds. If the last call is a MMSI number stored in your directory, the number's directory location will be displayed below the **ID ANNUNCIATOR**. After the radio you're calling acknowledges the call, communication will be established as soon as you press the **PTT** button.

### New Call

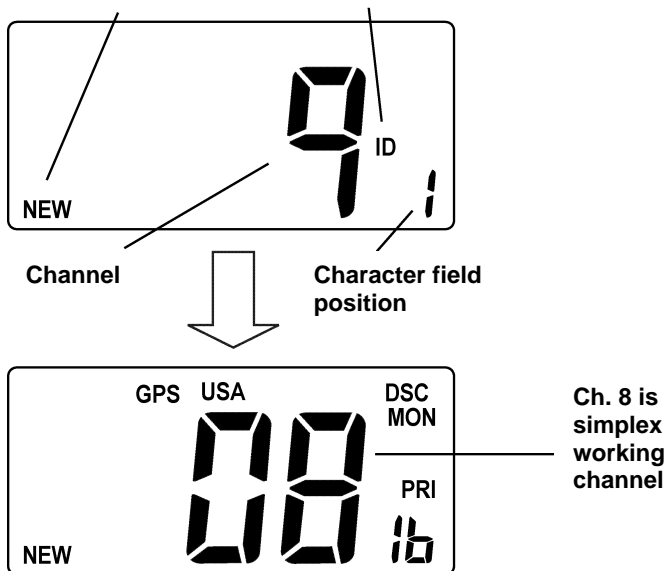
This procedure allows you to place an individual call.

1. Press the **CALL** key once. **LAST** blinks.
2. Use the  $\uparrow$   $\downarrow$  keys to select **NEW CALL**.
3. Press the **CALL** key again. You can now enter the MMSI number.

### NOTE:

New call MMSI numbers are not stored. They are for temporary use. You must enter them into your directory to have the numbers stored permanently.

## NEW and ID Annunciators will blink



4. Use the  $\uparrow$   $\downarrow$  keys to set proper MMSI data for the digit shown. After correct verification of the first digit of the MMSI number, touch the **MEM** key to advance. The small digit now displays the 2nd character position with a "0" as the big digit and "2" as the small digit. Set the second MMSI digit using  $\uparrow$   $\downarrow$  keys and touch the **MEM** key to store. Repeat the operation until all 9 digits have been entered. Double-check your MMSI entry, toggling through each individual digit by pressing the **MEM** key. There is no backup or edit mode, so if you make a mistake entering the number, you'll have to start over. Press the **16/9** key to exit or just turn off the radio. After you are satisfied with the new MMSI number, press the call key.

5. Press the **CALL** key and the radio will transmit the request. If there is no acknowledgement (**ACK**) after 4 seconds, the radio transmits the call again. The radio will stay in standby mode, indicated by the flashing ID Annunciator, until an **ACK** is received. If an **ACK** is not received, you can press the call key again and the call is placed again. You can exit the call function at any time by pressing the **16/9** key twice.

### To place a non-DSC call:

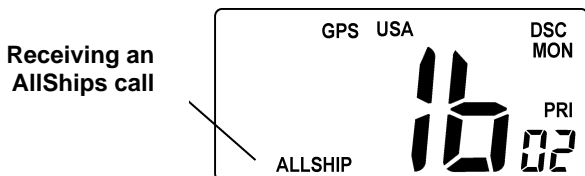
When making a non-DSC call, you'll have to switch to a communication channel after making initial contact, so be sure to select a channel authorized for the type of communication you desire.

1. Select an appropriate communication channel.
2. Tune your radio to Ch. 16 or Ch. 9. Speak slowly and clearly, stating the name of the vessel you are trying to contact followed by "this is *(your ship name and call sign)*."
3. When the other vessel responds, say "go to *(the desired channel number)* over."
4. Switch to the other working channel. After you are sure it is clear, call out to the other vessel, stating the vessel's name, followed by "this is *(your ship name and call sign)*."

## Reception

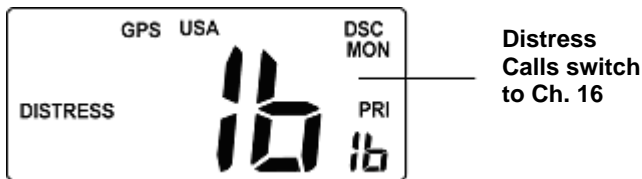
### AllShips Call

When receiving any type of an **ALLSHIP'S CALL**, a ring tone sounds and the calling radio's requested working channel is selected for communication. There is no **ACK** required from your radio. If you want to contact the calling vessel, just press the **PTT** button.



### Distress Call

The reception of a **DISTRESS CALL** automatically sets the receiving radio's channel to Ch. 16. Press the **16/9** key to turn off the distress alarm.



## NOTE

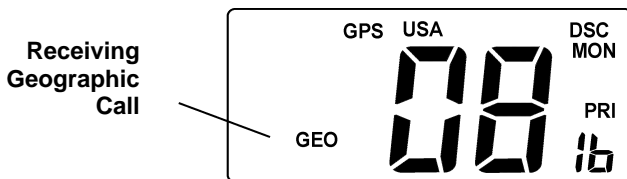
The LVR-850 does not respond to two types of DSC Distress calls:

1. Distress relay from an intermediary vessel.
2. Distress relay acknowledgment (**ACK**) from a coastal station.

### Geographic Call

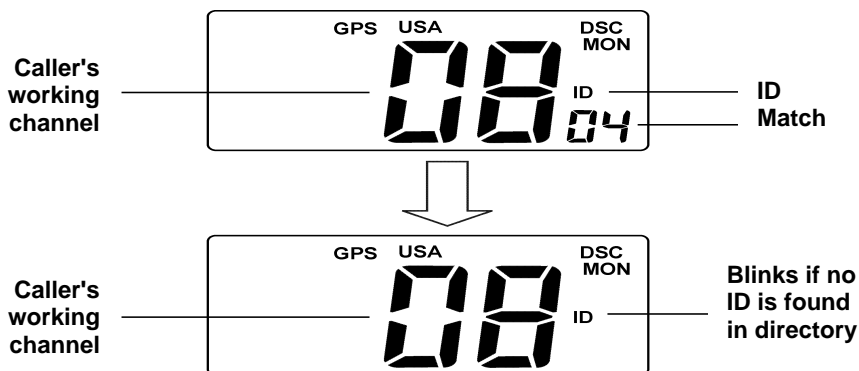
The LVR-850 is able to receive geographic calls. When it does, a ring tone sounds and the calling radio's requested working channel is chosen for communication. There is no **ACK** required from your radio. If the calling vessel's MMSI matches a number stored in the directory, the directory location will be displayed in the lower right hand corner of the screen. If you want to respond to the vessel, press the **PTT** button.





### Individual Call

Reception of an individual DSC call sets up communication on the working channel requested by the caller. Your radio automatically transmits an **ACK** (Acknowledgement) message back to the calling radio. If the caller's MMSI matches an entry in your directory, its location will be displayed. If no match is made, the **ID ANNUNCIATOR** blinks. Press **16/9** to ignore the call. To respond to the vessel, press the **PTT** button.



### Channels

To tune into one of the 84 channels on the LVR-850 radio, use the  $\uparrow \downarrow$  keys to scroll through the channels. Refer to the enclosed channel chart in the back of this book for proper usage and understanding. In the US and Canada, **WX** (Weather) channels are available. **WX** channels are not available for international use.

An **A ANNUNCIATOR** will be displayed when an alternate channel is used. That is telling you the radio is tuned to a simplex channel and normal ship-to-ship communication is appropriate. If the **A ANNUNCIATOR** is off, the radio is operating in duplex mode.

### Channel Bank

The Channel Bank has three settings, one each for US, Canada and International use. Press and hold the **H/L** and **WX** keys at the same time to switch channel banks. The annunciator will display **USA**, **INT** or **CAN** based on your selection. Refer to the channel chart appendix for proper usage.

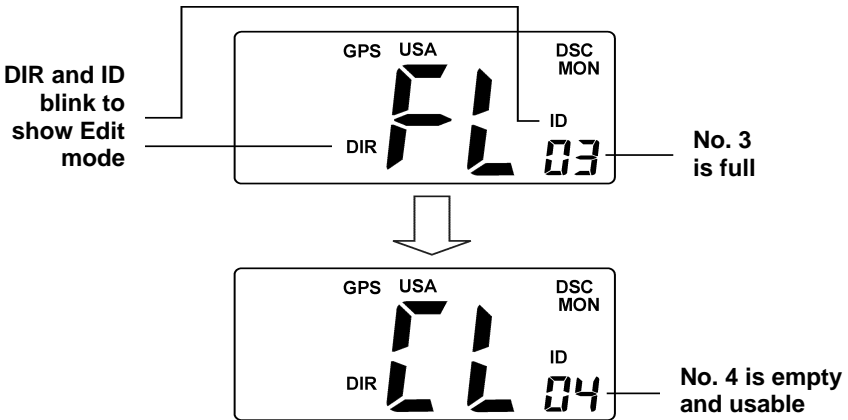
## Directory

The Directory is an organized list of (up to 10) MMSI numbers stored on the DSC calling directory.

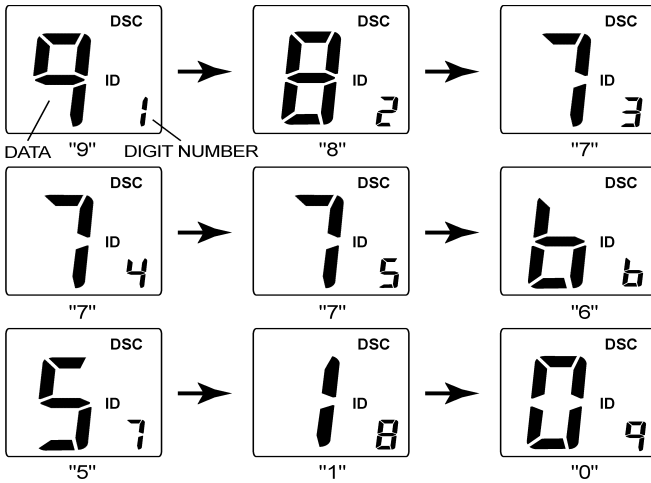
### Storing/Editing MMSI Data

To store a new MMSI in an unused location, follow these steps:

1. Press the **CALL** key to display **LAST**. Use the  $\uparrow \downarrow$  keys to select **DIR**. The **DIR ANNUNCIATOR** blinks.
2. Press the **CALL** key. The **ID ANNUNCIATOR** starts to blink **ON/OFF**, indicating the directory **EDIT MODE** is activated.

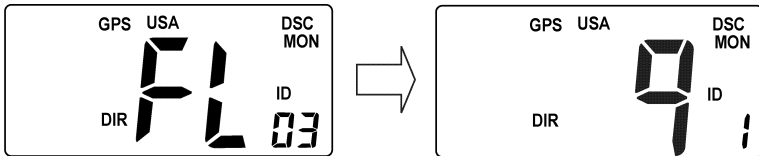


3. Use the  $\uparrow \downarrow$  keys to select an unused location. If the number location is full, **FL** is displayed. If the location is available, **CL** appears on the screen.
4. Select the **CL** location and press the **MEM** key to advance to the MMSI input screen.
5. Press the  $\uparrow \downarrow$  keys to enter the MMSI digits. After entering the first MMSI digit, press the **MEM** key to enter the second number. The big digit, again starts at "0" and the small digit now displays "2" The small number will increase each time you add a MMSI digit. Use the  $\uparrow \downarrow$  keys to set the second MMSI digit and touch the **MEM** key to store. Repeat the operation until all 9 digits have been entered and verified. After entering the MMSI, review each digit by pressing the **MEM** key. If there is a mistake, press the **16/9** key to exit or just turn off the radio. The MMSI will not be stored. After you are satisfied with your MMSI entry, hold down the **CALL** key for 5 seconds to store the number.
6. Press the **16/9** key to revert to the main screen.



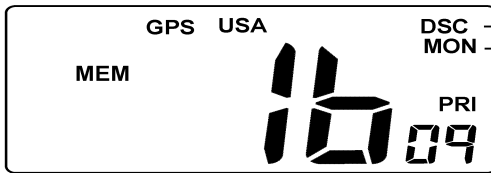
The example shows the MMSI Data 98776510 being entered.

To change or edit MMSI data, select a **FL** location and press the **MEM** key to change the data. After inputting the 9-digit MMSI, hold down the **CALL** key for 5 seconds to store the new MMSI.



### DSC Monitor

To be sure the DSC Monitor mode is on, hold down the **CALL** key for 5 seconds to toggle the DSC Monitor mode off and on. It must be on for your radio to receive a DSC call. The **DSC MON ANNUNCIATOR** will be displayed onscreen, if Ch. 70 is being accessed. Since there is no independent Ch. 70 receiver, the radio normally monitors Ch. 70 and checks other channels on a regular basis to detect a squelch break. This method ensures the radio will acquire the most DSC calls possible.



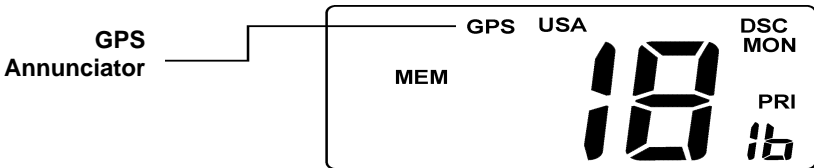
DSC Monitor must be on for radio to receive calls

**NOTE**

DSC calls will NOT be received when the radio is receiving or sending out a transmission. During scanning, Ch. 70 is monitored on an allocated time-slot basis and DSC calls will be received.

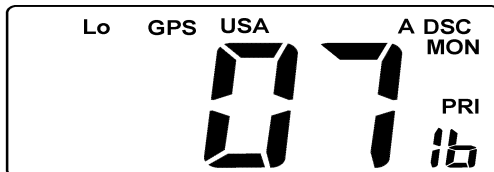
**GPS Operation**

Your radio is NMEA 0183 compatible, which means it can work with a GPS unit. To be certain your location is automatically transmitted during a distress call, make sure your GPS unit is on and operational at all times. The GPS data is sent through Ch. 70 to the coast guard and is the primary starting point of any search and rescue mission. If **THE GPS ANNUNCIATOR** is blinking, the GPS data is not valid.



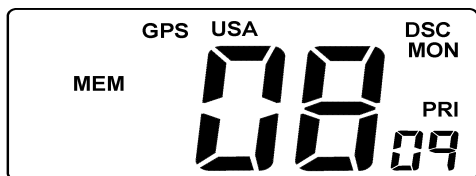
**H/L**

The **H/L** key gives you control over the radio's wattage. The high-end is 25 Watts. The low-end is 1 Watt. If the **LO ANNUNCIATOR** is off, the radio will transmit at 25 Watts. Some channels do not accept transmissions or are restricted to a 1-Watt level. If you come across one of those channels and you try to switch to 25W, you will hear a 3-tone error beep, meaning you either can not transmit on that channel or it only accepts transmissions at the 1W (Lo) level.



**Memory Operation**

Normally, the **MEM ANNUNCIATOR** appears on the display to alert the user the channel is stored in the memory channel list. The following figure shows Ch. 8 is stored in memory.



You can easily add or delete channels from the memory channel list. **For your safety, DO NOT delete priority Ch. 16.**

To add a new channel, use the  $\uparrow \downarrow$  keys to select the desired channel (shown above in big digits). If the channel is currently stored as a memory channel, the **MEM ANNUNCIATOR** will be displayed.

To add a new channel to the list, hold down the **MEM** key until the **MEM ANNUNCIATOR** appears. The new channel is now added to the list. To delete a channel from the list, use the  $\uparrow \downarrow$  keys to choose a channel saved in the memory list. You will know a channel from the memory list has been chosen when the **MEM** Annunciator appears on the screen. Hold down the **MEM** key for three seconds to delete the channel. The **MEM ANNUNCIATOR** no longer will be displayed when the channel is tuned in.

#### **NOTE**

To clear and reset all the memory channels, hold down the **MEM** key while turning on the radio. This clears all memory channels with the exception of the Priority Channel.

### **Position Send/Request**

#### **Transmission**

Your radio can send and receive information on location if it is connected to a GPS unit. This will allow you to locate a vessel without transmitting messages back and forth.

#### **To send your position (P1):**

1. Press the **CALL** key, then use the  $\uparrow \downarrow$  keys to select DIR from the main screen and press Call.
2. To edit or enter the P1 memory location, use the  $\uparrow \downarrow$  keys to select position P1 from the directory. P1 will be displayed in the bottom right corner of the display. If the P1 location has **CL** in the window, you must enter the MMSI of the vessel to which you're trying to send your position. Press **MEM** and use the  $\uparrow \downarrow$  keys to enter the MMSI numbers, pressing **MEM** after each digit has been entered. When finished, press and hold the **CALL** key for five seconds. The screen will show **FL P1**, letting you know the MMSI is now stored in the P1 location. The MMSI number will be stored in the P1 location until you edit or replace the MMSI information.

3. Press the Call key and the big digit will blink and the channel will switch to Ch. 16. Press the **CALL** key again and the position data will be sent through Ch. 70. After the transmission on Ch. 70, the ID Annunciator will flash, indicating it is waiting for an **ACK**. If an **ACK** is not received, another call can be made to send your position to the same MMSI by pressing the **CALL** key. When the position send is acknowledged, an alarm will be heard. Press the **16/9** key to cancel the alarm.

4. Press **16/9** key to return to the main screen.

#### **To request a position (P2):**

1. Press **CALL**, then use the  $\uparrow \downarrow$  keys to select **DIR** from the main screen.

2. To edit or enter the P2 location, use the  $\uparrow \downarrow$  keys to select position P2 from the directory. P2 will be displayed in the bottom right corner of the display. If the P2 location has **CL** in the window, you must enter the MMSI of the vessel from which you're trying to request a position. Press **MEM** and use the  $\uparrow \downarrow$  keys to enter the MMSI numbers, pressing **MEM** after each digit has been entered. When finished, press and hold the **CALL** key for five seconds. The screen will show **FL P2**, letting you know the MMSI is now stored in the P2 location. The MMSI number will be stored in the P2 location until you edit or replace the MMSI information.

3. Press the **CALL** key and the big digit will blink and the channel will be switched to Ch. 16. Press the **CALL** key again and the position data will be requested through Ch. 70. After the transmission on Ch. 70, the ID Annunciator will flash, indicating it is waiting for an **ACK**. If an **ACK** is not received, another call can be made to request the position of the same MMSI by pressing the **CALL** key. When the position request is acknowledged, an alarm will be heard. Press the **16/9** key to cancel the alarm.

4. Press **16/9** key to return to the main screen. The vessel's location will be displayed on the GPS map.

#### **Reception**

##### **To receive a position send:**

1. An alarm will sound and the **ACK** Annunciator will be displayed from the main screen.

2. Press the **16/9** key to stop the alarm.

3. If the MMSI number of the vessel sending its location is in your directory, its directory location will be displayed. If the vessel is not in your directory, its MMSI number will be displayed.

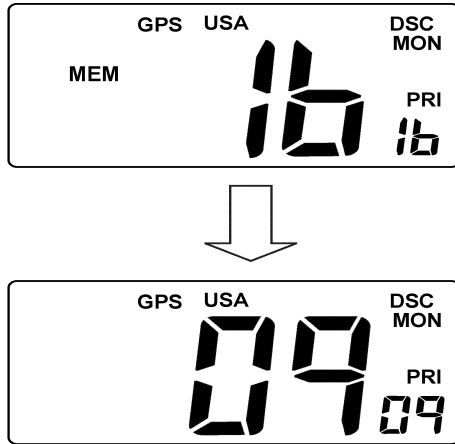
4. Press **16/9** to return to the main screen. The vessel's location will be displayed on the GPS map.

### To receive a position request:

1. The alarm will sound and P1 will be displayed on the screen in big digits. The MMSI directory location will be shown next to it, in small digits.
2. To send your position, press the **CALL** key.
3. To ignore the position request, press the **16/9** key to silence the alarm, then press it again to return to the main screen.

### Priority Channel (16/9)

The **16/9** key is used to switch priority channels. When you first turn on the radio, its default priority channel is Ch. 16. To switch priority channels, hold down the **16/9** key for a few seconds until the priority channel switches to the other channel. This is particularly useful when you want to make a non-DSC call and Ch. 16 is receiving a lot of transmission traffic. The **16/9** key also allows you to exit various operation modes, ignore incoming calls and cancel outgoing calls.



With a quick press of the **16/9** key the priority channel immediately is selected with high (25W) transmission power. Press the **16/9** key again and it selects the last used channel.

### PTT (Push To Talk)

This key is on the microphone. Press and hold it down to send a transmission. There is a 5-minute maximum transmission timer, per FCC regulations.

### Scan

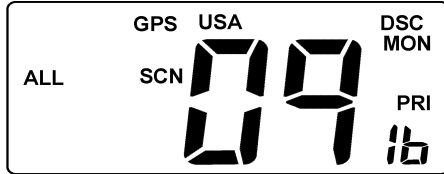
There are three primary scanning modes, **ALLSCAN**, **MEMORY SCAN**, and **PRIORITY SCAN**.

## NOTE

Remember, you cancel any scan mode at anytime by pressing the **16/9** or **SCN** key.

### To start an All Scan

To scan through all available channels, press and hold the **SCN** key for three seconds. **ALL SCN** will appear on the display. The radio now will scroll through every available channel as it scans.

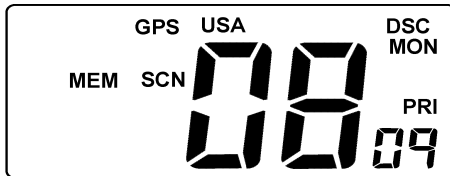


A noisy channel that interrupts the scanning can be temporarily eliminated from the scan list by holding down the **MEM** key. The channel receiving the signal will be skipped, allowing the scanning to continue uninhibited. Turning the radio off and on again will restore all the channels back to the **ALLSCAN** memory list.

### To start a Memory Scan

To scan through channels in the memory scan list, press the **MEM** key, then push the **SCN** key. If you are in a different scanning mode, you must stop the scan before switching to a **MEMORY SCAN**. In that case, press **SCN | MEM | SCN**.

To add channels to the memory scan list, use the  $\uparrow \downarrow$  keys to tune in each of the channels you want to monitor. As you tune in each channel, depress **MEM** for three seconds to add it to the memory list. The **MEM** Annunciator will appear, letting you know the channel has been added to memory..



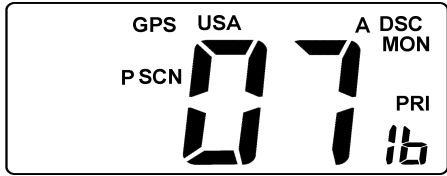
While in the **MEM** scan mode, touch the **WX** key to toggle the **WX ALERT** function off and on. The scan will stop when a channel picks up a signal. The scan will not continue until the input signal stops. To stop scanning, press the **SCN** key or the **16/9** key. Press in the **PTT** button exits the scan mode at the last channel display.

### To start a Priority Scan

Pressing the **SCN** key activates the **PRIORITY SCAN** mode. **P SCAN** will ap-



pear on the display. The priority channel is scanned every 2 seconds, even if another channel has a squelch break.



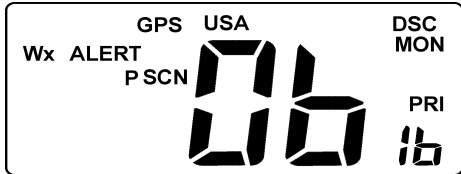
When a signal is received on the priority channel, the scan stops and the radio receives the priority transmission. **WX ALERT** can be toggled off and on by pressing the **WX** key.

### Screen

When the unit is turned on the LCD light display is on and stays on. There is no contrast control.

### Weather (Wx)

Dark clouds on the horizon? Press the **WX** key to enter the **Wx (WEATHER) MODE** and get the latest weather information. The last used Wx channel always appears first. Use the  $\uparrow$   $\downarrow$  keys to change the **WX** channel. In **PRIORITY SCAN** or **MEMORY SCAN MODES**, pressing the **WX** key allows the **WX ALERT** function to be toggled off and on. Select the **WX** channel before starting a **PRIORITY SCAN** or **MEMORY SCAN**.



If a **Wx ALERT** – a 1050Hz-tone burst transmitted from the NOAA Weather service – is issued, a special circuit in the radio detects the tone and during scanning modes (except All Scan), a loud 2-tone warning will sound. The warning tone is canceled by pressing any key. The radio will stop scanning and switch to the **WX** channel to broadcast the warning. You know the radio is scanning the **WX** channel, if you see the **WX ANNUNCIATOR** flash as it scans through the weather channels.

# Frequency Charts & Usage

MARINE VHF CHANNELS							
Chan	U	I	C	S/D	Tx	Rx	Channel Usage
01A	X			S	156.050		Port operation and commercial. VTS in selected areas.
01		X	X	D	156.050	160.650	Public Correspondence (Marine Operator).
02		X	X	D	156.100	160.700	Public Correspondence (Marine Operator).
03A	X			S	156.150		U.S. Government only, Coast Guard.
03		X	X	D	156.150	160.750	Public Correspondence (Marine Operator).
04A			X	S	156.200		Pacific coast: Coast Guard, East coast: Commercial fishing.
04		X		D	156.200	160.800	Public Correspondence (Marine Operator), Port operation, Ship movement.
05A	X		X	S	156.250		Port operation. VTS in Seattle.
05		X		D	156.250	160.850	Public Correspondence (Marine Operator), Port operation, Ship movement.
06	X	X	X	S	156.300		Intership Safety.
07A	X		X	S	156.350		Commercial.
07		X		D	156.350	160.950	Public Correspondence (Marine Operator), Port operation, Ship movement.
08	X	X	X	S	156.400		Commercial Intership only.
09	X	X	X	S	156.450		Boater calling channel, Commercial and noncommercial (Recreational).
10	X	X	X	S	156.500		Commercial.
11	X	X	X	S	156.550		Commercial. VTS in selected areas.
12	X	X	X	S	156.600		Port operation. VTS in selected areas.
13	X	X	X	S	156.650		Intership navigation safety (bridge to bridge). 1 W*
14	X	X	X	S	156.700		Port operation. VTS in selected areas.
15	X			S	---	156.750	Environmental (Receive only).
15		X	X	S	156.750		Commercial, noncommercial, Ship movement (1 Watt only).
<b>16</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>S</b>	<b>156.800</b>		<b>International Distress, Safety and Calling.</b>
17	X	X	X	S	156.850		State controlled (1 Watt only).
18A	X		X	S	156.900		Commercial.
18		X		D	156.900	161.500	Port operation, Ship movement.
19A	X			S	156.950		U.S. Commercial.
19A			X	S	156.950		Coast Guard.
19		X		D	156.950	161.550	Port operation, Ship movement.

- Hold down H/L key while pressing PTT for 25W transmitting power on these special marine VHF channels.
- Abbreviations
- U - USA, I - international, C - Canada
  - TX - Transmit frequency, RX - Receive frequency
  - S/D - Simplex/Duplex

MARINE VHF CHANNELS							
Chan	U	I	C	S/D	Tx	Rx	Channel Usage
20A	X			S	157.000		Port operation.
20		X	X	D	157.000	161.600	Canada: Coast Guard only. International: Port operations and Ship movement.
21A	X		X	S	157.050		U.S. Government only. Canada: Coast Guard.
21		X		D	157.050	161.650	Port operation, Ship movement.
22A	X		X	S	157.100		U.S. and Canadian Coast Guard liaison and Maritime Safety Info. Broadcasts announced on Ch. 16.
22		X		D	157.100	161.700	Port operation, Ship movement.
23A	X			S	157.150		U.S. Government only.
23		X	X	D	157.150	161.750	Public Correspondence (Marine Operator).
24	X	X	X	D	157.200	161.800	Public Correspondence (Marine Operator).
25	X	X	X	D	157.250	161.850	Public Correspondence (Marine Operator).
26	X	X	X	D	157.300	161.900	Public Correspondence (Marine Operator).
27	X	X	X	D	157.350	161.950	Public Correspondence (Marine Operator).
28	X	X	X	D	157.400	162.000	Public Correspondence (Marine Operator).
60		X	X	D	156.025	160.625	Public Correspondence (Marine Operator).
61A	X		X	S	156.075		U.S. Government only, Canada: Coast Guard Pacific coast, Comm. fishing East coast.
61		X		D	156.075	160.675	Public Correspondence (Marine Operator), Port operation, Ship movement.
62A			X	S	156.125		Pacific coast: Coast Guard, East coast: Commercial fishing only.
62		X		D	156.125	160.725	Public Correspondence (Marine Operator), Port operation, Ship movement.
63A	X		X	S	156.175		Port operation and commercial. VTS in selected areas
63		X		D	156.175	160.775	Public Correspondence (Marine Operator), Port operation, Ship movement.
64A	X		X	S	156.225		U.S. Government only, Canada: Commercial fishing
64		X		D	156.225	160.825	Public Correspondence (Marine Operator), Port operation, Ship movement.
65A	X		X	S	156.275		Port operations.
65		X		D	156.275	160.875	Public Correspondence (Marine Operator), Port operation, Ship movement.
66A	X		X	S	156.325		Port operations.
66		X		D	156.325	160.925	Public Correspondence (Marine Operator), Port operation, Ship movement.
67	X	X	X	S	156.375		U.S. Commercial. Used for bridge to bridge communications in lower Mississippi River, Intership only. Canada: Commercial fishing. 1Watt*
68	X	X	X	S/D	156.425		Noncommercial (Recreational).
69	X	X	X	S	156.475		Noncommercial (Recreational). Canada: Commercial fishing only. International: Port operations and ship movement.
<b>70</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>S</b>	<b>156.525</b>		<b>Digital Selective Calling (DSC). Voice communication not allowed.</b>
71	X	X	X	S	156.575		U.S. & Canada: Noncommercial (Recreational). International: Port operations and ship movement.
72	X	X	X	S	156.625		Noncommercial (Intership only).

MARINE VHF CHANNELS							
Chan	U	I	C	S/D	Tx	Rx	Channel Usage
78		X		D	156.925	161.525	Public Correspondence (Marine Operator), Port operation, Ship movement.
79A	X		X	S	156.975		Commercial.
79		X		D	156.975	161.575	Port operations and ship movement.
80A	X		X	S	157.025		Commercial.
80		X		D	157.025	161.625	Port operations and ship movement.
81A	X		X	S	157.075		U.S. Govt. only, Environmental protection operations
81		X		D	157.075	161.675	Port operations and ship movement.
82A	X		X	S	157.125		U.S. Government only. Canada: Coast Guard only.
82		X		D	157.125	161.725	Public Correspondence (Marine Operator), Port operation, Ship movement.
83A	X		X	S	157.175		U.S. Government only. Canada: Coast Guard only.
83		X		D	157.175	161.775	Public Correspondence (Marine Operator).
84	X	X	X	D	157.225	161.825	Public Correspondence (Marine Operator).
85	X	X	X	D	157.275	161.875	Public Correspondence (Marine Operator).
86	X	X	X	D	157.325	161.925	Public Correspondence (Marine Operator).
87	X	X	X	D	157.375	161.975	Public Correspondence (Marine Operator).
88A	X			S	157.425		Commercial, Intership only.
88		X	X	D	157.425	162.025	Public Correspondence (Ship to coast).

- Hold down H/L key while pressing PTT for 25W transmitting power on these special marine VHF channels.
- Abbreviations
- U - USA, I - international, C - Canada
  - TX - Transmit frequency, RX - Receive frequency
  - S/D - Simplex/Duplex

NOAA VHF WEATHER CHANNELS							
CHAN	U	I	C	S/D	Rx	CHANNEL USAGE	
WX01		X	X	X	---	162.550	Weather (Receive Only).
WX02		X	X	X	---	162.400	Weather (Receive Only).
WX03		X	X	X	---	162.475	Weather (Receive Only).
WX04		X	X	X	---	162.425	Weather (Receive Only).
WX05		X	X	X	---	162.450	Weather (Receive Only).
WX06		X	X	X	---	162.500	Weather (Receive Only).
WX07		X	X	X	---	162.525	Weather (Receive Only).
WX08		X	X	X	---	161.650	Weather (Receive Only).
WX09		X	X	X	---	161.775	Weather (Receive Only).
WX10		X	X	X	---	163.275	Weather (Receive Only).

**LOWRANCE ELECTRONICS**  
**FULL ONE-YEAR WARRANTY**

"We," "our," or "us" refers to LOWRANCE ELECTRONICS, INC., the manufacturer of this product. "You" or "your" refers to the first person who purchases this product as a consumer item for personal, family or household use.

We warrant this product against defects or malfunctions in materials and workmanship, and against failure to conform to this product's written specifications, all for one (1) year from the date of original purchase by you. WE MAKE NO OTHER EXPRESS WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER CONCERNING THIS PRODUCT. Your remedies under this warranty will be available so long as you can show in a reasonable manner that any defect or malfunction in materials or workmanship, or any non-conformity with the product's written specifications, occurred within one year from the date of your original purchase, which must be substantiated by a dated sales receipt or sales slip. Any such defect, malfunction, or non-conformity which occurs within one year from your original purchase date will either be repaired without charge or be replaced with a new product identical or reasonably equivalent to this product, at our option, within a reasonable time after our receipt of the product. If such defect, malfunction, or non-conformity remains after a reasonable number of attempts to repair by us, you may elect to obtain without charge a replacement of the product or a refund for the product. THIS REPAIR, OR REPLACEMENT OR REFUND (AS JUST DESCRIBED) IS THE EXCLUSIVE REMEDY AVAILABLE TO YOU AGAINST US FOR ANY DEFECT, MALFUNCTION, OR NON-CONFORMITY CONCERNING THE PRODUCT OR FOR ANY LOSS OR DAMAGE RESULTING FROM ANY OTHER CAUSE WHATSOEVER. WE WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO ANYONE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR OTHER INDIRECT DAMAGE OF ANY KIND.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty does NOT apply in the following circumstances: (1) when the product has been serviced or repaired by anyone other than us; (2) when the product has been connected, installed, combined, altered, adjusted, or handled in a manner other than according to the instructions furnished with the product; (3) when any serial number has been effaced, altered, or removed; or (4) when any defect, problem, loss, or damage has resulted from any accident, misuse, negligence, or carelessness, or from any failure to provide reasonable and necessary maintenance in accordance with the instructions of the owner's manual for the product.

We reserve the right to make changes or improvements in our products from time to time without incurring the obligation to install such improvements or changes on equipment or items previously manufactured.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

REMINDER: You must retain the sales slip or sales receipt proving the date of your original purchase in case warranty service is ever required.

**LOWRANCE ELECTRONICS**  
**12000 E. SKELLY DRIVE, TULSA, OK 74128**  
**(800) 324-1356**

# How to Obtain Service...

## ...in the USA:

We back your investment in quality products with quick, expert service and genuine Lowrance parts. If you're in the United States and you have technical, return or repair questions, please contact the Factory Customer Service Department. Before any product can be returned, you must call customer service to determine if a return is necessary. Many times, customer service can resolve your problem over the phone without sending your product to the factory. To call us, use the following toll-free number:

**800-324-1356**

8 a.m. to 5 p.m. Central Standard Time, M-F

*Lowrance Electronics may find it necessary to change or end our shipping policies, regulations, and special offers at any time. We reserve the right to do so without notice.*

## ...in Canada:

If you're in Canada and you have technical, return or repair questions, please contact the Factory Customer Service Department. Before any product can be returned, you must call customer service to determine if a return is necessary. Many times, customer service can resolve your problem over the phone without sending your product to the factory. To call us, use the following toll-free number:

**800-661-3983**

**905-629-1614 (not toll-free)**

8 a.m. to 5 p.m. Eastern Standard Time, M-F

## ...outside Canada and the USA:

If you have technical, return or repair questions, contact the dealer in the country where you purchased your unit. To locate a dealer near you, visit our web site and look for the Dealer Locator ([www.lowrance.com/support/dealerlocator](http://www.lowrance.com/support/dealerlocator)). Or, you can consult your telephone directory for listings.

# Accessory Ordering Information for all countries

To order Lowrance accessories, please contact:

1) Your local marine dealer. Most quality dealers that handle marine electronic equipment should be able to assist you with these items.

To locate a Lowrance dealer near you, visit our web site and look for the Dealer Locator ([www.lowrance.com/support/dealerlocator](http://www.lowrance.com/support/dealerlocator)). Or, you can consult your telephone directory for listings.

2) U.S. customers: LEI Extras Inc., PO Box 129, Catoosa, OK 74015-0129  
Call 1-800-324-0045 or visit our web site [www.lei-extras.com](http://www.lei-extras.com).

3) Canadian customers can write:

Lowrance/Eagle Canada, 919 Matheson Blvd. E. Mississauga, Ontario L4W2R7 or fax 905-629-3118.

## Shipping Information

If it becomes necessary to send a product for repair or replacement, you must first receive a return authorization number from Customer Service. Products shipped without a return authorization will not be accepted. When shipping, we recommend you do the following:

1. Please do not ship the knobs or mounting bracket with your unit.
2. If you are sending a check for repair, please place your check in an envelope and tape it to the unit.
3. For proper testing, include a brief note with the product describing the problem. Be sure to include your name, return shipping address and a daytime telephone number. An e-mail address is optional but useful.
4. Pack the unit in a suitable size box with packing material to prevent any damage during shipping.
5. Write the Return Authorization (RA) number on the outside of the box underneath your return address.
6. For your security, you may want to insure the package through your shipping courier. Lowrance does not assume responsibility for goods lost or damaged in transit.

Visit our web site:



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*We Lead, We Find, You Win.<sup>™</sup>*

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