

# FURUNO

## MARINE VHF RADIOTELEPHONE

With Class D DSC Modem and CH70 with receiver

### FM-4000

### Owner's Manual

- Commercial grade ITU class D DSC transceiver
- Superior receiver performance (80 dB rejection)
- 30W LoudHailer complete with listen-back and four fog horns, bells, and whistle
- 2.2-inch internal speaker produces clear, loud audio
- 2.58" x 1.28" dot matrix display
- Alphanumeric keypad allows direct entry of channel numbers or selection of most used functions
- NAV mode displays latitude/longitude, position, time, SOG, COG\*
- Oversized rotary selector, volume and squelch knobs
- Programmable scan, selectable priority scan, and dual watch
- One-button access to CH16 and CH9
- Treble and bass audio tone control
- Two inputs for optional Remote MIC
- Optional voice scrambler
- Multi-station intercom
- High and low voltage warnings

\* When attached to GPS Receiver



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# 1 GENERAL INFORMATION

## 1.1 INTRODUCTION

The FURUNO **FM-4000** is a Marine VHF Radiotelephone designed for use in the frequency range of 156.025 to 163.275 MHz. The **FM-4000** can be powered with 11 to 16 VDC power and has a switchable RF output power of 1 Watt or 25 Watts.

The **FM-4000** operates on all currently allocated marine channels. Channels are switchable for use with USA, International, or Canadian regulations. Emergency CH16 can be immediately selected by pressing the red [16/9] key. NOAA weather channels can also be accessed immediately by pressing the [WX] key.

The **FM-4000** incorporates DSC (Digital Selective Calling) Class D facilities which comply with ITU-R M.493-11 (DSC Class D). Class D operation provides continuous watch on DSC CH70 even if the radio is receiving a call.

Two Remote MICs (**CMP30**, remote-control speaker/microphone with display) are available.

The main features are

- Commercial grade ITU class D DSC transceiver
- Superior receiver performance (80 dB rejection)
- 30W LoudHailer complete with listen-back and four fog horns, bells, and whistle
- 2.2-inch internal speaker produces clear, loud audio
- 2.58" x 1.28" dot matrix display
- Alphanumeric keypad allows direct entry of channel numbers or selection of most used functions
- NAV mode displays latitude/longitude, position, time, SOG, COG\*
- Oversized rotary selector, volume and squelch knobs
- Programmable scan, selectable priority scan, and dual watch
- One-button access to CH16 and CH9
- Treble and bass audio tone control
- Two inputs for optional Remote MIC
- Optional voice scrambler
- Multi-station intercom
- High and low voltage warnings
- × When connected to a GPS receiver.

## 2 PACKING LIST

When the package containing the transceiver is first opened, please check it for the following contents:

- **FM-4000** Transceiver
- Mounting Bracket and attaching hardware including mic hook, bracket knob and screws
- Owner's Manual
- Warning Sticker
- Power Cord

## 3 OPTIONS

<b>MMB-84</b> .....	Flush-Mount Bracket
<b>CMP30B/W</b> .....	Remote MIC (Black/White)
<b>CT-100</b> .....	23-foot Extension Cable for Remote MIC
<b>CVS2500</b> .....	Voice Scrambler
<b>BH-2A</b> .....	<b>Bluetooth</b> <sup>®</sup> Headset
<b>BU-1</b> .....	<b>Bluetooth</b> <sup>®</sup> Master Unit
<b>CAB-2</b> .....	Charge Holder for BH-2A

## 4 SAFETY / WARNING INFORMATION

This radio is restricted to occupational use, work related operations only where the radio operator must have the knowledge to control the exposure conditions of its passengers and bystanders by maintaining the minimum separation distance of 0.89 m (2.92 feet). Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.

### Antenna Installation:

The antenna must be located at least 0.89 m (2.92 feet) away from passengers in order to comply with the FCC RF exposure requirements.

### Lithium Battery:

This radio contains a lithium battery. At the end of the radio's useful life, under various state laws, it may be illegal to dispose of a lithium battery into the municipal waste stream. Check with your local solid waste officials for details about recycling options and proper disposal.

## **5 FCC RADIO LICENSE INFORMATION**

FURUNO radios comply with the Federal Communication Commission (FCC) requirements that regulate the Maritime Radio Service.

### **5.1 STATION LICENSE**

An FCC ship station license is no longer required for any vessel traveling in U.S. waters (except Hawaii) which is less than 20 meters in length. However, any vessel required to carry a marine radio on an international voyage, carrying an HF single sideband radiotelephone or marine satellite terminal is required to have a ship station license. FCC license forms, including applications for ship (506) and land station licenses can be downloaded via the Internet at [www.fcc.gov/forms](http://www.fcc.gov/forms). To obtain a form from the FCC, call (888) 225-5322.

### **5.2 RADIO CALL SIGN**

Currently the FCC does not require recreational boaters to have a Ship Radio Station License. The USCG recommends that you use your boat's registration number and the state in which it is registered.

### **5.3 CANADIAN SHIP STATION LICENSING**

You may need a license when traveling in Canada. If you do need a license contact their nearest field office or regional office or write:

**Industry Canada  
Radio Regulatory Branch  
Attn: DOSP  
300 Slater Street  
Ottawa, Ontario  
Canada, KIA 0C8**

### **5.4 FCC / INDUSTRY CANADA INFORMATION**

The following data pertaining to the transceiver is necessary to fill out the license application.

Type Acceptance ..... FCC Part 80  
Output Power ..... 1 Watt (low) and 25 Watts (high)  
Emission ..... 16K0G3E, 16K0G2B  
Frequency Range ..... 156.025 to 163.275 MHz  
FCC Type Number ..... K6630283X3S  
Industry Canada Type Approval ..... 511B-30283X3S

## **6 FCC NOTICE**

### **NOTICE**

Unauthorized changes or modifications to this equipment may void compliance with FCC Rules. Any change or modification must be approved in writing by STANDARD HORIZON.

### **NOTICE**

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 dealer or an experienced radio/TV technician for help.

## 7 GETTING STARTED

### 7.1 ABOUT VHF RADIO

The radio frequencies used in the VHF marine band lie between 156 and 158 MHz with some shore stations available between 161 and 163 MHz. The marine VHF band provides communications over distances that are essentially “line of sight” (VHF signals do not travel well through objects such as buildings, hills or trees). Actual transmission range depends much more on antenna type, gain and height than on the power output of the transmitter. On a fixed mount 25 W radio transmission expected distances can be greater than 15 miles, for a portable 5 W radio transmission the expected distance can be greater than 5 miles in “line of sight”.

### 7.2 SELECTING AN ANTENNA

Marine antennas are made to radiate signals equally in all horizontal directions, but not straight up. The objective of a marine antenna is to enhance the signal toward the horizon. The degree to which this is accomplished is called the antenna’s gain. It is measured in decibels (dB) and is one of the major factors in choosing an antenna. In terms of effective radiated power (ERP), antennas are rated on the basis of how much gain they have over a theoretical antenna with zero gain. A 3-foot, 3 dB gain antenna represents twice as much gain over the imaginary antenna.

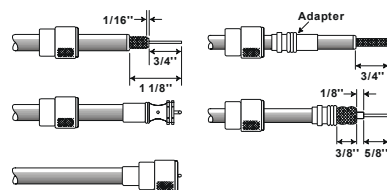
Typically a 3-foot 3 dB gain stainless steel whip is used on a sailboat mast. The longer 8-foot 6 dB fiberglass whip is primarily used on powerboats that require the additional gain.

### 7.3 COAXIAL CABLE

VHF antennas are connected to the transceiver by means of a coaxial cable – a shielded transmission line. Coaxial cables are specified by their diameters and construction.

For runs less than 20 feet, RG-58/U, about 1/4-inch in diameter, is a good choice. For runs over 20 feet but less than 50 feet, the larger diameter RG-8X or RG-213/U should be used. Cable runs over 50 feet should use RG-8X. For installation of the connector onto the coaxial cable see the figure below.

To get your coaxial cable through a fitting and into your boat’s interior, you may have to cut off the end plug and reattach it later. You can do this if you follow the directions that come with the connector. Be sure to make good soldered connections.





## 8 INSTALLATION

### 8.1 LOCATION

The radio can be mounted at any angle. Choose a mounting location that:

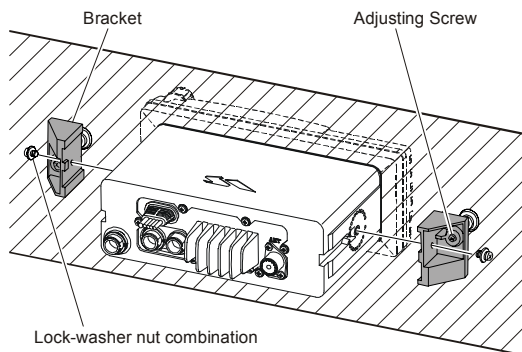
- is far enough from any compass to avoid any deviation in compass reading due to the speaker magnet (see the compass safe distances in the Safety Instructions)
- provides easy access to the front panel controls and rear connectors
- allows connection to a power source and an antenna
- has nearby space for installation of a microphone hanger
- the antenna must be mounted at least three feet from the radio

**Note:** To insure the radio does not affect the compass or the radio's performance is not affected by the antenna location, temporarily connect the radio in the desired location and:

- a. Examine the compass to see if the radio causes any deviation.
- b. Connect the antenna and key the radio. Check to ensure the radio is operating correctly by requesting a radio check.

### 8.2 OPTIONAL MMB-84 FLUSH MOUNT INSTALLATION

1. Make a rectangular template for the flush mount measuring 2.9" H x 8.1" W (72 x 205 mm).
2. Use the template to mark the location where the rectangular hole is to be cut. Confirm that the space behind the dash or panel is deep enough to accommodate the transceiver (at least six inches deep).  
There should be at least 1/2 inch between the transceiver's heatsink and any wiring, cables or structures.
3. Cut out the rectangular hole and insert the transceiver.
4. Fasten the brackets to the sides of the transceiver with the lock washer nut combination so that the mounting screw base faces the mounting surface.
5. Turn the adjusting screw to adjust the tension so that the transceiver is tight against the mounting surface.



### 8.3 OPTIONAL CMP30 REMOTE MIC

The **CMP30** Remote MIC permits remote control of the **FM-4000**'s radio, DSC and PA/Fog functions. In addition the **FM-4000** can operate as a full function intercom system.

1. Connect the extension cable to the remote MIC eight pin connector on the rear panel, then tighten the cable nut (See Figure 3).
2. Referring to Figure 3, make a 1.2" (30 mm) hole in the wall, then insert the extension cable into this hole. Connect the gasket and mounting base to the extension cable connector using the nut.
3. Drill the four screw holes (approx. 2 mm) on the wall, then install the mounting base to the wall using four screws.

Put the rubber cap onto the nut. The installation is now complete.

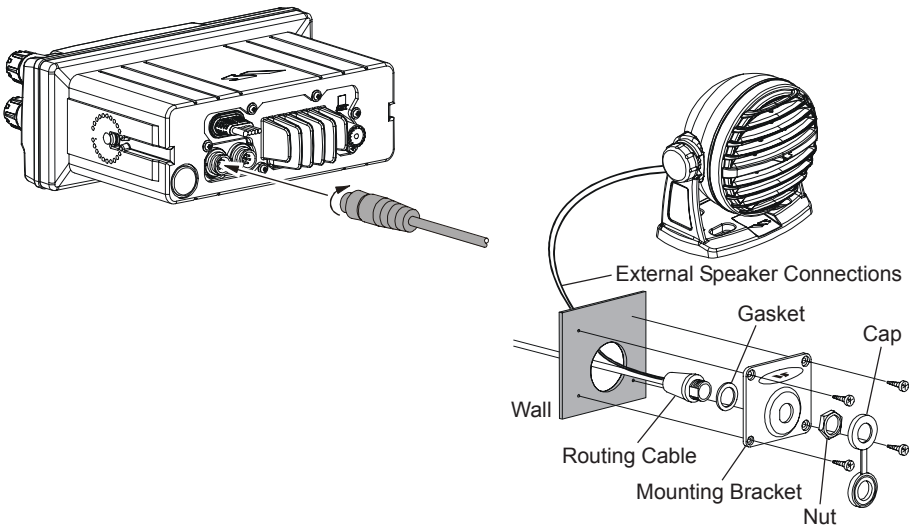
#### NOTE

The routing cable can be cut and spliced, however care needs to be taken when reconnecting the wires to ensure water integrity.

Before cutting the cable, make sure it is not plugged into the radio. After cutting you will notice there are the following wires:

Yellow, Green, Brown, Purple, Blue, Green, Red\*, Shield\*

\* The red and shield wires are wrapped in foil. Remove the foil, and separate the red and shield wires.



## Remote MIC or External Speaker Selection

By default the internal speaker is turned on, however it can be turned off to use the external speaker, when the Remote MIC is installed.

### **Remote MIC procedure**

1. Press and hold down the [CALL(MENU)] key until the "Radio Setup" menu appears.
2. Press the [ENT] key, then use the [▲] or [▼] key to select "Ext Speaker."
3. Press the [ENT] key.
4. Press the [▲] or [▼] key to select "Off" (External speaker off) or "On" (External speaker on).
6. Press the [ENT] key to save the selection, then press the [16/9] key to return to radio operation.

```
-Setup Menu-
→Radio Setup
DSC Setup

Set>[ENT], Clear>[CLR]
```

```
-Radio Setup-
Contrast
SOG Unit
Magnetic
Key Beep
Unit Name
→Ext Speaker
Set>[ENT], Clear>[CLR]
```

```
-EXT Speaker-
→On
Off

Set>[ENT], Clear>[CLR]
```

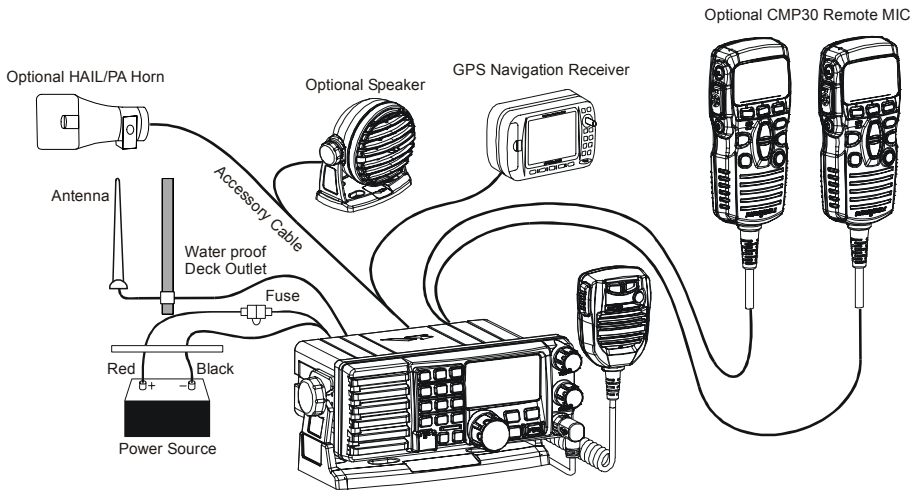
## 8.4 ELECTRICAL CONNECTIONS

### CAUTION

**Reverse polarity connections will damage the radio!**

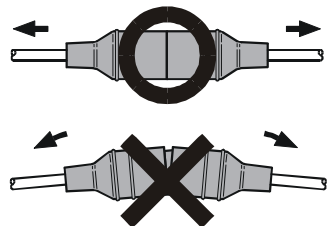
Connect the power cord and antenna to the radio. Antenna and power supply connections are as follows:

1. Mount the antenna at least three feet away from the radio. At the rear of the radio, connect the antenna cable. It must have a PL259 connector.
2. Connect the red power wire to a 13.8 VDC  $\pm 20\%$  power source. Connect the black power wire to a negative ground.
3. It is advisable to have a certified marine technician check the power output and the standing wave ratio of the antenna after installation.



### Fuse Replacement

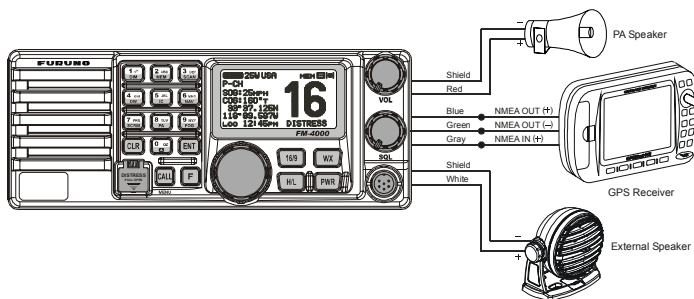
To take out the fuse from the fuse holder, hold the both ends of the fuse holder and pull the fuse holder apart, do not bend the fuse holder. When you replace the fuse, please confirm that the fuse is tightly fixed on the metal contact located inside the fuse holder. If the metal contact holding the fuse is loose, the fuse holder may heat up.



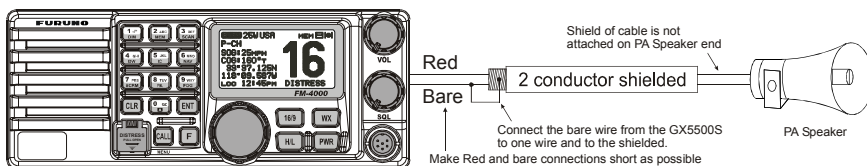
## 8.5 ACCESSORY CABLE

Wire Color/Description	Connection Examples
WHITE - External Speaker (+)	Connect to external 4 Ohm audio speaker
SHIELD - External Speaker (-)	Connect to external 4 Ohm audio speaker
RED - PA Speaker (+)	Connect to external 4 Ohm PA speaker
SHIELD - PA Speaker (-)	Connect to external 4 Ohm PA speaker
GREEN - NMEA Ground	Connect to NMEA (-) connection of GPS
BLUE- NMEA Input (+)	Connect to NMEA (+) output of GPS
GRAY-NMEA Output (+)	Connect to NMEA (+) input of GPS

When connecting the PA speaker, external speaker or GPS receiver, strip off about 1 inch (2.5 cm) of the specified wire's insulation, then splice the ends together.



Note: In some areas powerful AM broadcast stations may be heard when in listen-back mode. In this case change the speaker wire to 2-conductor shielded audio cable. See the illustration below for connections.



- The GPS receiver must have its NMEA output turned on and baud rate set to “4800” in the Setup menu. If there is a selection for parity, select “None”.
- For further information on interfacing /setting up your GPS receiver, please refer to its Operator’s Manual.
- **FM-4000** can read NMEA-0183 version 2.0 or higher.
- The NMEA supported sentences are:  
 Input: GLL, GGA, RMC and GNS (RMC sentence is recommended)  
 Output: DSC and DSE  
 (DSC sentences to FURUNO plotter for position polling)

## 8.6 CHANGING THE TIME INDICATION

Set the radio to show UTC time, or local time with the offset inputted in section “8.5 CHANGING THE GPS TIME.”

1. Press and hold down the [CALL(MENU)] key until the “Radio Setup” menu appears.
2. Press the [ENT] key, then use the CHANNEL selector knob to select “Time Display”.
3. Press the [ENT] key.
4. Turn the CHANNEL selector knob to select “UTC” or “Local.”
5. Press the [ENT] key to store the selected setting.
6. Press the [CLR] key to return to the “Radio Setup” menu, then press the [CLR] key again to return to radio operation.

```
-Setup Menu-
+Radio Setup
DSC Setup

Set>[ENT], Clear>[CLR]

-Radio Setup-
Dimmer
Contrast
Time Offset
+Time Display
SDG Unit
Magnetic
Set>[ENT], Clear>[CLR]

-Time Display-
+UTC
Local

Set>[ENT], Clear>[CLR]
```

## 8.7 CHANGING THE COG INDICATION

GPS Course Over Ground can be shown in True or Magnetic bearing. To change the COG indication, do as follows:

1. Press and hold down the [CALL(MENU)] key until the “Radio Setup” menu appears.
2. Press the [ENT] key, then use the CHANNEL selector knob to select “Magnetic”.
3. Press the [ENT] key.
4. Turn the CHANNEL selector knob to select “Magnetic” or “True.”
5. Press the [ENT] key to store the selected setting.
6. Press the [CLR] key to return to the “Radio Setup” menu, then press the [CLR] key again to return to radio operation.

```
-Setup Menu-
+Radio Setup
DSC Setup

Set>[ENT], Clear>[CLR]

-Radio Setup-
Dimmer
Contrast
Time Offset
Time Display
SDG Unit
+Magnetic
Set>[ENT], Clear>[CLR]

-Magnetic-
Magnetic
+True

Set>[ENT], Clear>[CLR]
```



## 9 CONTROLS AND INDICATIONS

### NOTE

This section defines each control of the transceiver. See the illustration on the next page for the location of the controls. For detailed operating instructions, see Chapter 10.

### 9.1 CONTROLS AND CONNECTORS

#### ① VOLUME CONTROL (VOL/PWR)

Adjusts the audio volume level. Turn the control clockwise to increase the audio volume level.

##### **Secondary Use**

Controls the listen-back volume in the PA or Fog mode.

#### ② SQUELCH CONTROL (SQL)

Adjust this control clockwise to set the point at which random noise on the channel does not activate the audio circuits but a received signal does. This point is called the squelch threshold. Be careful not to set the squelch too high; reception of wanted transmissions will be degraded.

#### ③ MIC Connector

Connects to the supplied noise-canceling speaker microphone.

#### ④ KEYPAD

##### [WX] Key

Immediately recalls the last-selected NOAA weather channel. Pressing the [WX] key again reverts to the previously selected working channel.

##### **Secondary use:**

Press the [WX] key while pressing and holding the [16/9] key to switch between USA, International and Canadian bands.

##### [PWR] Key

Turns the transceiver on and off. To turn the transceiver on, press and hold this key until the LCD turns on. To turn it off, press and hold this key until the LCD turns off. When the power is turned on, the transceiver is set to the last-selected channel.

##### [16/9] Key

Immediately recalls CH16. Hold down the [16/9] key to recall CH9. Press the [16/9] key again to revert to the previously selected working channel.

##### **Secondary use:**

Press the [WX] key while pressing and holding the [16/9] key to switch between USA, International and Canadian bands.



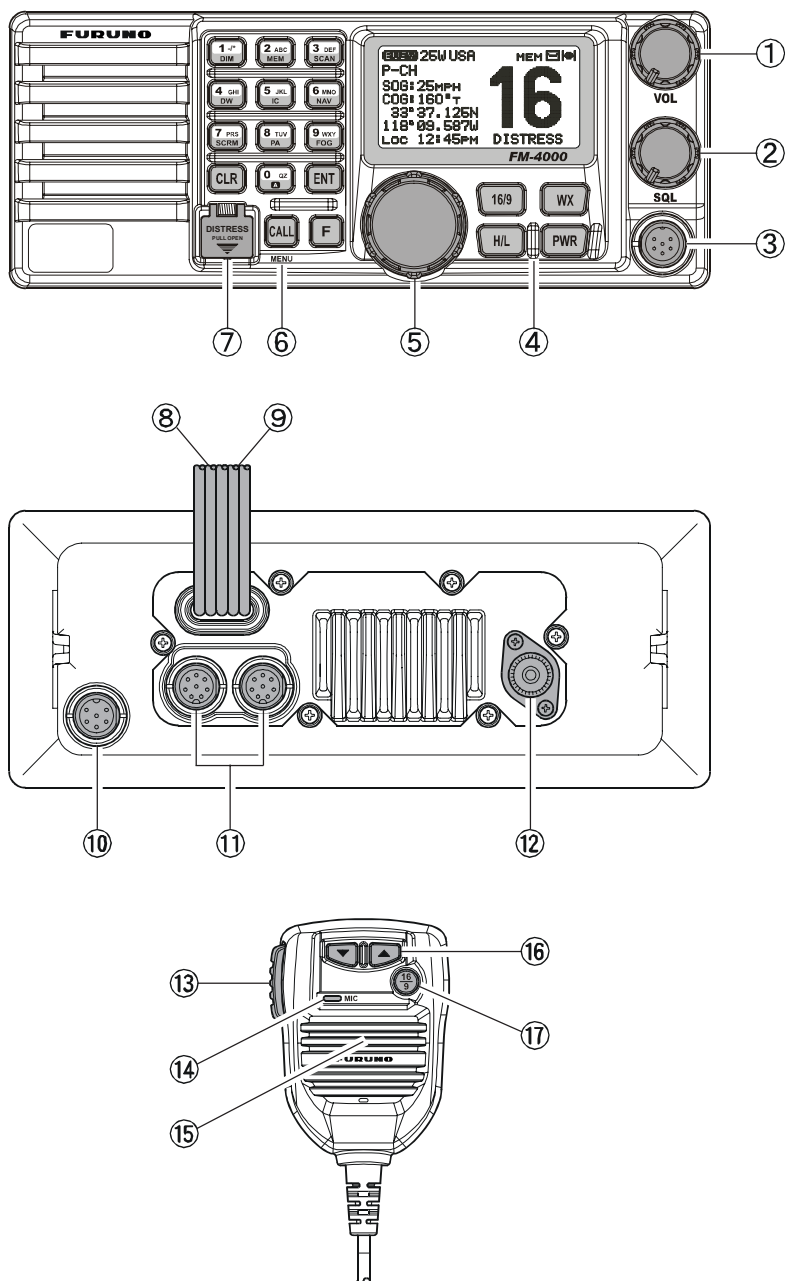


Figure 4. Controls and Connectors

## [H/L] Key

Toggles between 25 W (High) and 1 W (Low) power. When the [H/L] key is pressed while the transceiver is on CH13 or CH67, the power will temporarily switch from LO to HI power until the **PTT** is released. The [H/L] key does not function on transmit inhibited and low-power only channels.

## ⑤ CHANNEL SELECTOR KNOB

This rotary knob selects channels and to chooses menu items (such as the DSC menu, Radio Setup and DSC Setup menu). The [UP(▲)] / [DOWN(▼)] keys on the microphone can also be used to select channels and menu items.

### **Secondary Use**

- Press the [F] key first then press the [3(SCAN)] key, and turn the **CHANNEL** selector knob while holding down the [3(SCAN)] key to confirm memory channels for scanning.
- Adjusts the PA output level while in PA/FOG mode.

## ⑥ KEYPAD

### [1(DIM)] Key

When in the radio mode, this key directly inputs the digit “1” in a channel number.

### **Secondary use**

Press the [F] key first, then press the [1(DIM)] key to access the LCD Dimmer menu. See section “**10.16 LCD DIMMER**” for details.

### [2(MEM)] Key

When in the radio mode, this key directly inputs the digit “2” in a channel number.

### **Secondary use**

Press the [F] key first then press the [2(MEM)] key to memorize the selected channel into the transceiver scan memory for scanning. Repeating the same procedure ([F] → [2(MEM)]), deletes the channel from the scan memory. See section “**10.13 SCANNING**” for details.

### [3(SCAN)] Key

When in the radio mode, this key directly inputs the digit “3” in a channel number.

### **Secondary use** (*Depends on the transceiver version*)

Press the [F] key first then press the [3(SCAN)] key to start and stop the scanning of programmed channels. See section “**10.13 SCANNING**” for details.

#### [4(DW)] Key

When in the radio mode, this key directly inputs the digit “4” in a channel number.

##### **Secondary use**

Press the [F] key first then press the [4(DW)] key to scan for voice communications on the priority channel and another selected channel until a signal is received on either channel (Dual Watch). See section “**10.12 DUAL WATCH (TO CH16)**” for details.

#### [5(IC)] Key

When in the radio mode, this key directly inputs the digit “5” in a channel number.

##### **Secondary use**

Press the [F] key first then press the [5(IC)] key, when the optional Remote MIC is connected, to activates Intercom function between radio and Remote MIC. See section “**10.17 INTERCOM OPERATION**” for details.

#### [6(NAV)] Key

When in the radio mode, this key directly inputs the digit “6” in a channel number.

##### **Secondary use**

Press the [F] key first then press the [6(NAV)] key, and the LCD displays NAV GPS Data; Time, SOG (Speed Over Ground), and COG (Course Over Ground). Requires a GPS receiver, connected to the **FM-4000** with the accessory cable. See section “**8.5 ACCESSORY CABLE**” for details.

#### [7(SCRM)] Key

When in radio mode, this key directly inputs the digit “7” in a channel number.

##### **Secondary use**

Press the [F] key first then press the [7(SCRM)] key, when the optional **CVS2500** Voice Scrambler Unit is installed, to operate the Voice Scrambler function. See section “**10.18 VOICE SCRAMBLER**” for details.

#### [8(PA)] Key

When in the radio mode, this key directly inputs the digit “8” in a channel number.

##### **Secondary use**

Press the [F] key first then press the [8(PA)] key to operate the 30 Watt PA function. See section “**10.14 PA/FOG OPERATION**” for details.

### [9(FOG)] Key

When in the radio mode, this key directly inputs the digit “9” in a channel number.

#### **Secondary use**

Press the [F] key first then press the [9(FOG)] key to operate the Fog Horn function. See section “10.14 PA/FOG OPERATION” for details.

### [0] Key

When in the radio mode, this key directly inputs the digit “0” in a channel number.

### [CLR] Key

Cancels the menu selection and/or key input.

### [ENT] Key

Confirms the menu selection and/or key input.

### [CALL(MENU)] Key

Opens the DSC OPERATION menu. The “Individual Call,” “Group Call,” and “All Ship Call” functions can be accessed from the DSC OPERATION menu.

#### **Secondary use**

Press and hold the [CALL(MENU)] key to access the “Radio Setup” menu (see section “12 RADIO SETUP”) or “DSC Setup” menu (see section “11 DIGITAL SELECTIVE CALLING”).

RADIO SETUP menu	DSC SETUP menu
Contrast	Individual Directory
Time Offset	Individual Reply
Time Display	Individual Ack
SOG Unit	Individual Ringer
Magnetic	Group Directory
Priority CH	Position Reply
SCAN Type	Position Input*
SCAN Resume	DSC Beep
Key Beep	User MMSI
Weather Alert	*: Shown when a GPS receiver is not connected.
CH Name	
Unit Name	
Tone Control	
FOG Frequency	
Calendar	

### [F] Key

Press the [F] key to activate the “Alternate” key function.

### ⑦ [DISTRESS] Key

Send a DSC Distress Call. For details, see section “11.3.1 Transmitting a DSC Distress Call.”

⑧ **ACCESSORY CONNECTION CABLE**

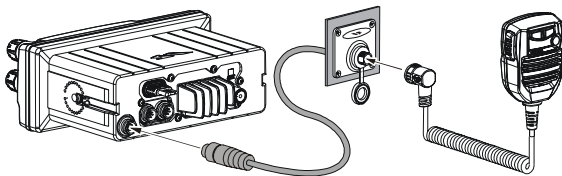
Connects the **FM-4000** to a GPS receiver, a PA speaker, and an external speaker.

⑨ **DC INPUT CABLE**

Connects the radio to a DC power supply capable of delivering 12 to 16 V DC.

⑩ **FRONT PANEL REMOTE MIC Connector**

Connects the supplied Hand Microphone if desired. This connector is used to remote the front panel speaker MIC. This allows the connection of two MICs, one at the front panel and one on the rear panel.



⑪ **REMOTE MIC CONNECTORS**

Connects the **FM-4000** to the Remote MIC. See section “**13 REMOTE MIC OPERATION**” for details.

⑫ **ANTENNA JACK**

Connects an antenna to the transceiver. Use a marine VHF antenna with an impedance of 50 ohms.

⑬ **PTT (Push-To-Talk) SWITCH**

Keys the transmitter when the transceiver is in the radio mode. If the transceiver is in the Intercom mode (between the Remote MIC and the **FM-4000**), it activates the **FM-4000**'s microphone for voice communications.

⑭ **MICROPHONE**

Transmits the voice message with reduction of background noise, using Clear Voice Noise Reduction Technology.

⑮ **MICROPHONE SPEAKER**

The same audio heard through internal radio speaker is heard through microphone speaker.

⑯ **[UP(▲)] / [DOWN(▼)] KEYS**

These keys function the same as the **CHANNEL** selector knob on the front panel of the transceiver.

⑰ **[16/9] Key**

Immediately recalls CH16. Press and hold the **[16/9]** key to recall CH9. Press the **[16/9]** key again to revert the radio to the previously selected channel.

## 10 BASIC OPERATION

### 10.1 PROHIBITED COMMUNICATIONS

The FCC prohibits the following communications:

- False distress or emergency messages;
- Messages to “any boat” except in emergencies and radio tests;
- Messages to or from a vessel on land;
- Transmission while on land;
- Obscene, indecent, or profane language (potential fine of \$10,000).

### 10.2 RECEPTION

1. After the transceiver has been installed, ensure that the power supply and antenna are properly connected.
2. Press and hold the **PWR** key until the radio turns on.
3. Turn the **SQL** knob fully counterclockwise. This state is known as “squelch off”.
4. Rotate the **VOL** knob clockwise until noise or audio from the speaker is at a comfortable level.
5. Turn the **SQL** knob clockwise until the random noise disappears. This state is known as the “squelch threshold.”
6. Turn the **CHANNEL** selector knob to select the desired channel. Refer to the channel chart on page 91 for available channels.
7. The keypad on the front panel may be used to directly select channels. For example, to select CH68:
  1. Press [**6(NAV)**].
  2. Press [**8(PA)**].
  3. Press [**ENT**].In the USA and Canadian modes, press and hold down the [**0**] key to select the “A” channel. Example to select CH22A:
  1. Press [**2(MEM)**].
  2. Press [**2(MEM)**].
  3. Press [**0**] until “A” appears to the right of the channel number.
  4. Press [**ENT**].
8. When a message is received, adjust the volume to the desired listening level. The “**BUSY**” indicator appears if the channel is busy.

### 10.3 TRANSMISSION

1. Perform steps 1 through 6 in 10.2 RECEPTION.
2. Before transmitting, monitor the channel to ensure it is clear.  
**THIS IS AN FCC REQUIREMENT!**
3. Press the **PTT** (push-to-talk) switch, and the indication “**T X**” appears.
4. Speak slowly and clearly into the microphone.
5. When you have finished transmitting, release the **PTT** switch.

#### NOTE

This is a noise-canceling microphone. Position the oval slot labeled “**MIC**” within one-inch (2.5 cm) from your mouth for optimum performance.

### 10.4 TRANSMIT TIME - OUT TIMER (TOT)

When the **PTT** switch on the microphone is held down, transmit time is limited to five minutes. This limits unintentional transmissions due to a stuck microphone. About 10 seconds before automatic transmitter shutdown, a warning beep sounds from the speaker(s). The transceiver will automatically go to the receive mode, even if the **PTT** switch is continually held down. Before transmitting again, the **PTT** switch must first be released and then pressed again.

### 10.5 SIMPLEX/DUPLEX CHANNEL USE

Refer to the VHF MARINE CHANNEL CHART (page 77) for instructions on use of simplex and duplex channels.

#### NOTE

All channels are factory-programmed in accordance with FCC (USA), Industry Canada (Canada), and International regulations. Mode of operation cannot be altered from simplex to duplex or vice-versa.

### 10.6 USA, CANADA, AND INTERNATIONAL MODE

1. To change the mode, hold the [**16/9**] key, then press the [**WX**] key. The mode changes from USA to International to Canadian with each press of the [**WX**] key.  
“**USA**” appears for the USA mode, “**INTL**” for the International mode, and “**CAN**” for the Canadian mode.
2. See the VHF MARINE CHANNEL CHART (page 77) for allocated channels in each mode.

## 10.7 NOAA WEATHER CHANNELS

1. To receive a NOAA (National Oceanic and Atmospheric Administration) weather channel, press the **[WX]** key. The transceiver will go to the last-selected weather channel.
2. Turn the **CHANNEL** selector knob on the radio or **[UP(▲)]** / **[DOWN(▼)]** keys on the microphone to select a different NOAA weather channel.
3. To exit from the NOAA weather channels, press the **[WX]** key. The transceiver returns to the channel it was on prior to a weather channel.

### 10.7.1 NOAA Weather Alert

In the event of extreme weather disturbances, such as storms and hurricanes, the NOAA sends a weather alert accompanied by a 1050 Hz tone and subsequent weather report on one of the NOAA weather channels. When the Weather Alert feature is enabled (see section “**12.10 WEATHER ALERT (ON/OFF)**”), the transceiver is capable of receiving this alert if you do the following:

1. Program NOAA weather channels into the transceiver’s memory for scanning. Program by the same procedure as for regular channels, referring to section “**10.13.2 Memory Scanning (M-SCAN)**.”
2. Press the **[SCAN]** key once to start memory scanning.
3. The programmed NOAA weather channels will be scanned along with the regular-programmed channels. However, scanning will not stop on a normal weather broadcast unless a NOAA alert is received.
4. When an alert is received on a NOAA weather channel, scanning will stop and the transceiver will emit a loud beep to alert the user to a NOAA broadcast.
5. Press the **[WX]** key to stop the alert tone and receive the weather report.

#### NOTE

If the **[WX]** key is not pressed at step 5, the alert tone will be emitted for five minutes and then the weather report will be received.

#### NOTE

The Weather Alert feature is also engaged while the transceiver is receiving on one of the NOAA weather channels.

### 10.7.2 NOAA Weather Alert Testing

NOAA tests the alert system every Wednesday between 11AM and 1PM. To test the **FM-4000**’s NOAA Weather feature at that time, setup as directed in section “**10.7.1 NOAA Weather Alert**” and confirm that you receive the alert.



## 10.8 EMERGENCY (CH16 USE)

CH16 is known as the Hail and Distress channel. An emergency may be defined as a threat to life or property. In such instances, be sure the transceiver is on and set it to CH16. Then do as follows:

1. Press the microphone push-to-talk switch and say “**Mayday, Mayday, Mayday**. This is \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_” (your vessel’s name).
2. Then repeat once: “**Mayday**, \_\_\_\_\_” (your vessel’s name).
3. Now report your position in latitude/longitude, or by giving a true or magnetic bearing (state which) to a well-known landmark such as a navigation aid or geographic feature such as an island or harbor entry.
4. Explain the nature of your distress (sinking, collision, aground, fire, heart attack, life-threatening injury, etc.).
5. State the kind of assistance you desire (pumps, medical aid, etc.).
6. Report the number of persons aboard and condition of any injured.
7. Estimate the present seaworthiness and condition of your vessel.
8. Give your vessel’s description: length, design (power or sail), color and other distinguishing marks. The total transmission should not exceed one minute.
9. End the message by saying “**OVER**”. Release the microphone push-to-talk and listen.
10. If there is no answer, repeat the above procedure. If there is still no response, try another channel.

## 10.9 CALLING ANOTHER VESSEL (CH16 OR CH9)

Channel 16 may be used for initial contact (hailing) with another vessel. However, its most important use is for emergency messages. This channel must be monitored at all times except when actually using another channel. It is monitored by the U.S. and Canadian Coast Guards and by other vessels. **Use of CH16 for hailing must be limited to initial contact only.** Calling should not exceed 30 seconds, but may be repeated three times at 2-minute intervals. In areas of heavy radio traffic, congestion on CH16 resulting from its use as a hailing channel can be reduced significantly in U.S. waters by using CH9 as the initial contact (hailing) channel for non-emergency communications. Here, also, calling time should not exceed 30 seconds but may be repeated three times at 2-minute intervals.

Prior to making contact with another vessel, refer to the channel charts in this manual, then select an appropriate channel for communications after initial contact. For example, CH68 and CH69 of the U.S. VHF charts are some of the channels available to non-commercial (recreational) boaters. Monitor your desired channel in advance to make sure you will not be interrupting other traffic,

and then go back to either CH16 or CH9 for your initial contact.

When the hailing channel (16 or 9) is clear, state the name of the other vessel you wish to call and then **“this is”** followed by the name of your vessel and your Station License (Call Sign). When the other vessel returns your call, immediately request another channel by saying **“go to,”** the number of the other channel, and **“over.”** Then switch to the new channel. When the new channel is not busy, call the other vessel.

After a transmission, say **“over,”** and release the microphone’s push-to-talk (PTT) switch. When all communication with the other vessel is completed, end the last transmission by stating your Call Sign and the word **“out.”** Note that it is not necessary to state your Call Sign with each transmission, only at the beginning and end of the contact.

Remember to return to CH16 when not using another channel. Some radios automatically monitor CH16 even when set to other channels or when scanning.

## 10.10 MAKING TELEPHONE CALLS

To make a radiotelephone call, use a channel designated for this purpose. The fastest way to learn which channels are used for radiotelephone traffic is to ask at a local marina. Channels available for such traffic are designated **Public Correspondence** channels on the channel charts in this manual. Some examples for USA use are Channels 24, 25, 26, 27, 28, 84, 85, 86, and 87. Call the marine operator and identify yourself by your vessel’s name. The marine operator will then ask you how you will pay for the call (telephone credit card, collect, etc.) and then link your radio transmission to the telephone lines.

The marine telephone company managing the VHF channel you are using may charge a link-up fee in addition to the cost of the call.

## 10.11 OPERATING ON CHANNELS 13 AND 67

CH13 is used at docks and bridges and by vessels maneuvering in port. Messages on this channel must concern navigation only, such as meeting and passing in restricted waters.

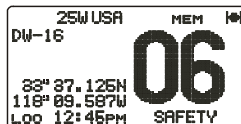
CH67 is used for navigational traffic between vessels.

By regulation, power is normally limited to 1 Watt on these channels. Your radio is programmed to automatically reduce power to this limit on these channels. However, in certain situations it may be necessary to temporarily use a higher power. See page 18 ([H/L] key) for how to temporarily override the low-power limit on these two channels.

## 10.12 DUAL WATCH (TO CH16)

1. Adjust the **SQL** knob until the background noise disappears.
2. Select the channel you wish to dual watch with CH16.
3. Press the **[F]** key followed by the **[4(DW)]** key. The display will scan between CH16 and the channel that was selected in step 2.

If a transmission is received on the channel selected in step 2, the **FM-4000** watches it and CH16.



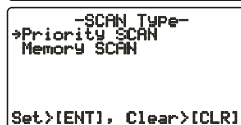
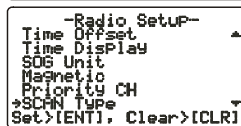
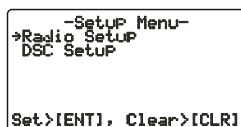
4. To stop Dual Watch, press the **[F]** key followed by the **[4(DW)]** key again.

## 10.13 SCANNING

Scanning allows the user to select the scan type from Memory scan or Priority scan. "Memory scan" scans the channels that were programmed into memory. "Priority scan" scans the channels programmed in memory with the priority channel.

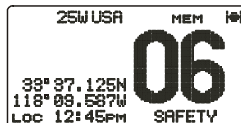
### 10.13.1 Selecting the Scan Type

1. Press and hold down the **[CALL(MENU)]** key until the "Radio Setup" menu appears.
2. Press the **[ENT]** key, then use the **CHANNEL** selector knob to select "SCAN Type".
3. Press the **[ENT]** key.
4. Turn the **CHANNEL** selector knob to select "Priority SCAN" or "Memory SCAN."
5. Press the **[ENT]** key to store the selected setting.
6. Press the **[CLR]** key to return to the "Radio Setup" menu, then press the **[CLR]** key again to return to radio operation.



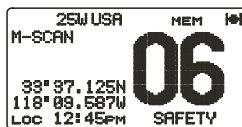
### 10.13.2 Memory Scanning (M-SCAN)

1. Adjust the **SQL** knob until background noise disappears.
2. Use the **CHANNEL** selector knob to select the channel to scan. Press the **[F]** key followed by the **[2(MEM)]** key. "MEM" appears on the LCD, which indicates that the channel is programmed into the transceiver's memory.
3. Repeat step 2 to select other channels to scan.
4. To DELETE a channel from the transceiver's memory, select the channel then press the **[F]** key followed by the **[2(MEM)]** key. "MEM" disappears from the LCD.
5. To start scanning, press the **[F]** key followed by the **[3(SCAN)]** key, "M-SCAN" appears on the LCD. Scanning will proceed from the lowest to



the highest programmed channel number and will stop on a channel when a transmission is received.

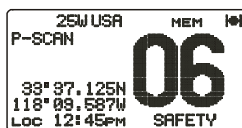
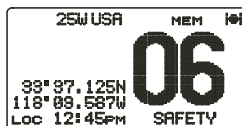
- The channel number will blink during reception.
- To stop scanning, press the [CLR], [16/9], or [WX] key.



### 10.13.3 Priority Scanning (P-SCAN)

In the default setting, Channel 16 is set as the priority channel. You may change the priority channel to the desired channel from CH16 on the Radio Setup menu. See section “10.13.1 Selecting the Scan Type,” and “12.6 PRIORITY CHANNEL SET.”

- Adjust the **SQL** knob until background noise disappears.
- Use the **CHANNEL** selector knob to select the channel to scan. Press the [F] key followed by the [2(MEM)] key. “MEM” appears on the display, which indicates that the channel is programmed into the transceiver’s memory.
- Repeat step 2 to select all the channels to scan.
- To DELETE a channel from the transceiver’s memory, select the channel then press the [F] key followed by the [2(MEM)] key. “MEM” is removed from the display.
- To start priority scanning, press the [F] key followed by the [3(SCAN)] key. “P-SCAN” appears on the LCD. Scanning will proceed between the memorized channels and the priority channel. The priority channel will be scanned after each programmed channel.
- To stop scanning, press the [CLR], [16/9], or [WX] key.



You may change the scan resume time in the Radio Setup menu. See section “12.8 SCAN RESUME TIME.”

## 10.14 PA/FOG OPERATION

The **FM-4000** has a 30W Hailer that can be used with any 4 Ohm PA horn. When in the Hail mode, the PA speaker listens back (acts as a microphone and sends sound to the front panel speaker and the speaker MIC) through the PA horn speaker which provides two-way communications through the PA horn speaker.

### NOTE

Before entering the PA or Fog mode, the **FM-4000** receives on the last-selected VHF channel to receive DSC calls.

### NOTE

In some areas powerful AM broadcast stations may be heard when in the listen-back mode. In this case change the speaker wire to 2-conductor shielded audio cable. See section “**8.5 ACCESSORY CABLE.**”

### PA Hail mode:

**PA Hail** mode allows the transceiver to be used as a power hailer when a HAIL/PA speaker is installed. The PA Hail mode has a listen-back feature which provides two-way communication through the HAIL/PA speaker.

### Fog Horn mode:

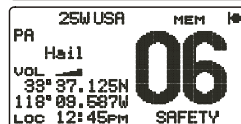
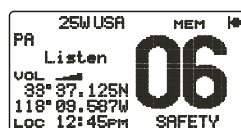
Automatic signaling is transmitted through the HAIL/PA speaker. When the Fog Horn, Bells or Whistle signal is not being outputted, the **FM-4000** listens back through the connected PA Horn speaker.

#### 10.14.1 Operating the PA Hail mode

1. Press the [F] key followed by the [2(MEM)] key to activate the PA Hail mode.
2. Press the **PTT** switch to speak through the HAIL/PA speaker.

Rotate the **CHANNEL** selector knob to control the AF output level. The AF output level can be set from 0 to 30 watts.

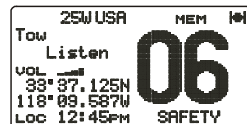
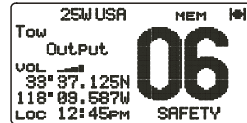
3. When the fog signal is not outputted, rotate the **VOL** knob to adjust the listen-back volume.
4. To exit the PA Hail mode, press the [CLR] key.



### 10.14.2 Operating the Fog Horn mode

Operator can select from Underway, Stop, Sail, Tow, Aground, Anchor, Horn and Siren. Refer to the Fog Horn Timing Chart on the next page.

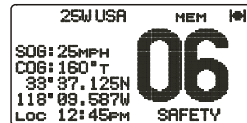
1. Press the [F] key followed by the [9(FOG)] key.
2. Turn the **CHANNEL** selector knob to select one of the eight functions described above.
3. Press the [ENT] key.
4. On the Horn and Siren modes, press the PTT switch to activate the tone through the HAIL/PA speaker. Rotate the **CHANNEL** selector knob to control the AF output level. The AF output level can be set from 0 to 30 watts.
5. When the fog signal is not outputted, rotate the **VOL** knob to adjust the listen-back volume.
6. To exit the Fog Horn mode, press the [CLR] key.



### 10.15 DISPLAYING SOG AND COG INFORMATION

The transceiver has the ability to display the time, SOG and COG data, as well as the vessel's position (LAT/LON), when connected to a GPS receiver.

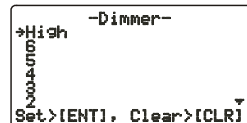
1. Press the [F] key followed by the [6(NAV)] key to display SOG and COG information.
2. To hide SOG and COG information, press the [F] key followed by the [6(NAV)] key again.



### 10.16 LCD DIMMER

You can adjust the LCD dimmer as follows:

1. Press the [F] key followed by the [1(DIM)] key to enable adjustment of the backlight intensity.
2. Turn the **CHANNEL** selector knob to select the desired backlight intensity.
3. Press the [CLR] key to return to "Radio" mode.



## FOG HORN TIMING CHART

TYPE	PATTERN	USAGE
UNDERWAY	<p>One 5-second blast every 120 seconds.</p>	Motor vessel underway and making way.
STOP	<p>Two 5-second blasts (separated by 2 seconds) every 120 seconds.</p>	Motor vessel underway but stopped (not making way).
SAIL	<p>One 5-second blast followed by two 1-second blasts (separated by 2 seconds) every 120 seconds.</p>	Sailing vessel underway, fishing vessel (underway or anchored), vessel not under command, a vessel restricted in her ability to maneuver (underway or at anchor), or a vessel towing or pushing another ahead.
TOW	<p>One 5-second blast followed by three 1-second blasts (separated by 2 seconds) every 120 seconds.</p>	Vessel under tow (manned).
AGROUND	<p>One 11-second ring every 60 seconds.</p>	Vessel is aground.
ANCHOR	<p>One 5-second ring every 60 seconds.</p>	Vessel is at anchor.

# 10.17 INTERCOM OPERATION

Connecting the optional **CMP30** Remote MIC to the **FM-4000** allows Intercom communications. See section “13.2 INTERCOM OPERATION” for operation of the **CMP30**.

## 10.17.1 Communication

1. Press and hold the [5(IC)] key while in the “Radio” mode to change to the “Intercom” mode.
2. If your **FM-4000** is equipped two Remote MICs, use the **CHANNEL** selector knob select the one of use (**RAM1**, **RAM2**, or **ALL**), then press the [ENT] key.
3. When the “Intercom” feature is activated, “Intercom” appears on the **FM-4000** and **CMP30**.
4. Press the **PTT** switch. “Talk” appears on the display.
 

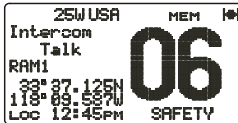
**NOTE:** A warning beep is emitted when the **FM-4000** microphone’s **PTT** switch is pressed while the Remote MIC’s **PTT** switch is pressed.
5. Speak slowly and clearly into the microphone, holding the microphone about 1/2 inch away from your mouth.
6. When finished, release the **PTT** switch.
7. Press the [CLR] key to return to the “Radio” mode.



(FM-4000 display)



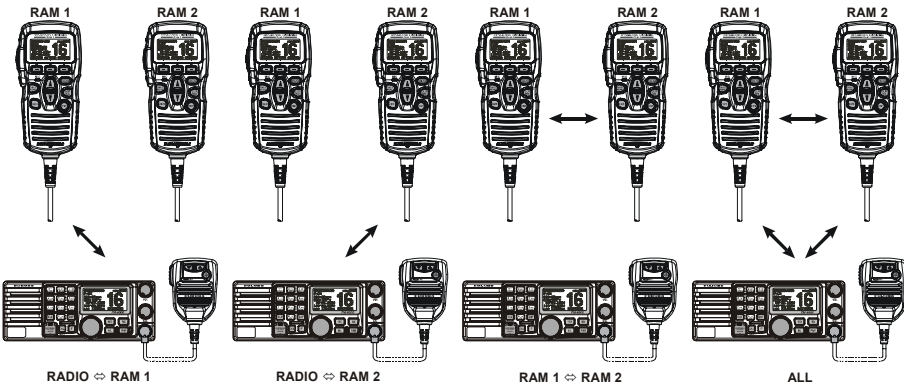
(CMP30 display)



(FM-4000's PTT switch is pressed)



(CMP30's PTT switch is pressed)



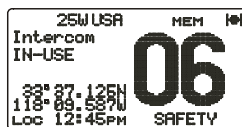


### 10.17.2 Calling

Hold down the [5(IC)] key when the “Intercom” mode is activated to send a calling beep to the Remote MIC.

#### NOTE

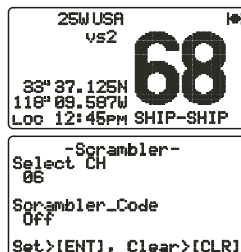
When both Remote MICs are set to the Intercom mode, the **FM-4000** is temporarily disabled until both Remote MICs exit the Intercom mode.



### 10.18 VOICE SCRAMBLER

If privacy of communications is desired, an optional **CVS2500** four-code voice scrambler (VS) can be installed in the transceiver. Contact your dealer to have the **CVS2500** installed.

1. Turn the **CHANNEL** selector knob to select the channel to be scramble.  
Note: The voice scrambler is inoperative on CH16 and CH70.
2. Press the [F] key followed by the [7(SCRM)] key to activate the voice scrambler. “VS” and scrambler number (“0,” “1,” “2,” or “3”) appear.
3. Press the [F] key, then press and hold down the [7(SCRM)] key until the “Scrambler” menu appears.
4. Turn the **CHANNEL** selector knob to change the scrambler code. The scrambler code can be set from “0” to “3.”
5. Press the [ENT] key to save the scrambler code and return to the radio operation mode (with voice scrambler).
6. Monitor the channel before transmitting.
7. To disable the voice scrambler, press the [F] key followed by the [7(SCRM)] key again. “VS” and scrambler number (“0,” “1,” “2,” or “3”) disappear.



# 11 DIGITAL SELECTIVE CALLING

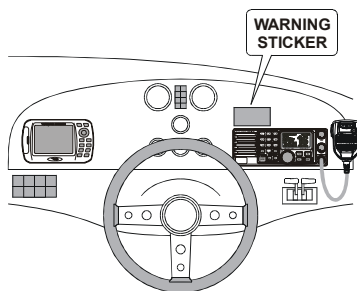
## 11.1 GENERAL

### WARNING

This radio is designed to generate a digital maritime distress and safety call to facilitate search and rescue. To be effective as a safety device, this equipment must be used only within communication range of a shore-based VHF marine CH70 distress and safety watch system. The range of the signal may vary but under normal conditions should be approximately 20 nautical miles.

### NOTE

A DSC warning sticker is included with the **FM-4000**. To comply with FCC regulations, this sticker must be mounted in a location that can be easily viewed from the location of the **FM-4000**.



Digital Selective Calling is a semi-automated method of establishing a radio call. DSC has been designated by the International Maritime Organization (IMO) as an international standard for establishing VHF, MF and HF radio calls. It has also been designated as a part of the Global Maritime Distress and Safety System (GMDSS). It is planned that DSC will eventually replace aural watches on distress frequencies and will be used to announce routine and urgent maritime safety information broadcasts.

This new system allows mariners to instantly send a Distress call with GPS position (when connected to the transceiver) to the US Coast Guard and other vessels within range of the transmission. DSC will also allow mariners to initiate or receive Distress, Urgency, Safety, Routine, Position Request, Position Send, and Group calls to or from another vessel equipped with a DSC transceiver.

## 11.2 MARITIME MOBILE SERVICE IDENTITY (MMSI)

### 11.2.1 What is an MMSI?

An MMSI is a nine-digit number used on marine transceivers capable of using DSC. This number is used like a telephone number to selectively call other vessels.

**THIS NUMBER MUST BE PROGRAMMED INTO THE RADIO TO OPERATE THE DSC FUNCTIONS.**

**How can I obtain an MMSI assignment?**

In the USA, visit the following websites to register:

<http://www.boatus.com/mmsi/> or

[http://seatow.com/boating\\_safety/mmsi.asp](http://seatow.com/boating_safety/mmsi.asp)

In the Canada, visit

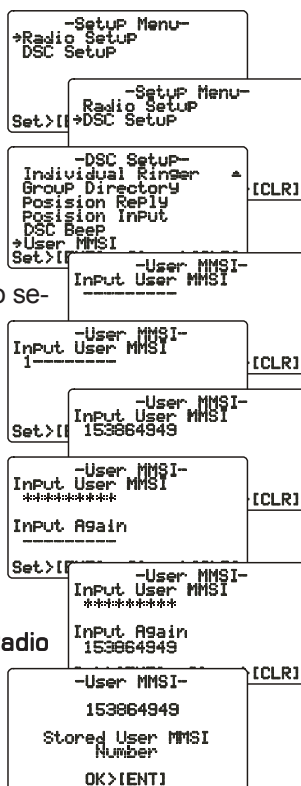
[http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/vwapj/cpc\\_2307e.pdf/\\$FILE/cpc\\_2307e.pdf](http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/vwapj/cpc_2307e.pdf/$FILE/cpc_2307e.pdf)

**11.2.2 Programming the MMSI**

**WARNING**

**An MMSI can be inputted only once.** Therefore **please be careful not to input the incorrect MMSI number.** If the user needs to change the MMSI number after it has been entered, the radio will have to be returned to the factory.

1. Press and hold down the [CALL(MENU)] key until the “Radio Setup” menu appears.
2. Turn the CHANNEL selector knob to the left to select the “DSC Setup” menu.
3. Press the [ENT] key, then use the CHANNEL selector knob to select “User MMSI.”
4. Press the [ENT] key.
5. Turn the CHANNEL selector knob or press the [UP(▲)] / [DOWN(▼)] key on the microphone to select the first number of your MMSI, then press the [ENT] key to go to the next number.
6. Repeat step 5 to set your MMSI (nine digits).
7. When finished programming the number, press and hold the [ENT] key. A confirmation message appears on the display. Set your MMSI again, then press and hold the [ENT] key.
8. Press the [ENT] key to store the number in the memory.
9. Press the [CLR] key twice to return to the “Radio Setup” menu, then press the [CLR] key again to return to radio operation.



## 11.3 DSC DISTRESS CALL


The **FM-4000** is capable of transmitting and receiving DSC distress messages to all DSC radios. The **FM-4000** may be connected to a GPS receiver to also transmit the latitude and longitude of your vessel.

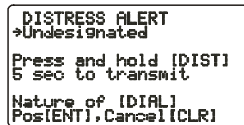
### 11.3.1 Transmitting a DSC Distress Call

#### NOTE

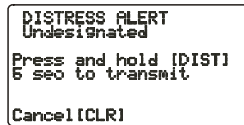
To transmit a DSC Distress call, an MMSI number must be programmed. See section “**11.2.2 Programming the MMSI.**”

In order for your ship’s location to be transmitted a GPS receiver must be connected to the **FM-4000**. See section “**8.5 ACCESSORY CABLE.**”

1. Lift the red spring-loaded DISTRESS cover, then the [DISTRESS] key. The “DISTRESS ALERT” menu appears on the LCD.
2. Press and hold the [DISTRESS] key. The radio’s display counts down (5-4-3-2-1) and then the Distress call is transmitted. The backlight of the LCD and keypad flash while the radio’s display is counting down.
3. When the distress signal is sent, CH70 and “ ” icon appear on the LCD.
4. The transceiver “shadow-watches” for a transmission between CH16 and CH70 until an acknowledgment signal is received. “DISTRESS” and “WAITING” appear on the LCD.
5. If an acknowledgment is received, select CH16 and advise your distress situation.
6. If no acknowledgment is received, the Distress call is repeated in 4-minute intervals until an acknowledgment is received.
7. When a DSC Distress acknowledgment is received, a distress alarm sounds and CH16 is automatically selected. The LCD shows the MMSI of the ship responding to your distress.  
RECEIVED ACK: Acknowledgment signal is received.  
RECEIVED RLY: Relay signal is received from another vessel or coast station.
8. To cancel the DSC distress alarm signal from the speaker, press any key.



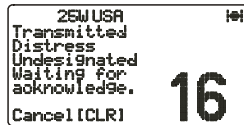
DISTRESS ALERT  
+Undesignated  
Press and hold [DIST]  
5 sec to transmit  
Nature of [DIAL]  
Pos[ENT], Cancel [CLR]



DISTRESS ALERT  
Undesignated  
Press and hold [DIST]  
5 sec to transmit  
Cancel [CLR]



25W USA  
Transmitting  
Distress  
Undesignated  
70



25W USA  
Transmitted  
Distress  
Undesignated  
Waiting for  
acknowledge.  
Cancel [CLR]  
16

### Transmitting a DSC Distress Alert with Nature of Distress

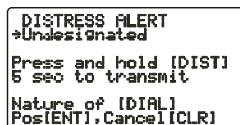
The **FM-4000** is capable of transmitting a DSC Distress Alert with the following “Nature of Distress” categories:

Undesignated, Fire, Flooding, Collision, Grounding, Capsizing, Sinking, Adrift, Abandoning, Piracy, MOB

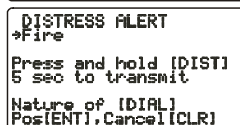
1. Lift the red spring-loaded **DISTRESS** key, then the [**DISTRESS**] key to show the “**DISTRESS ALERT**” menu.
2. Turn the **CHANNEL** selector knob to select the desired nature of distress category.
3. When the **FM-4000** is connected to a GPS receiver, skip to step 4.

When the **FM-4000** *is not* connected to a GPS receiver, you may send the latitude/longitude of your vessel manually, if desired.

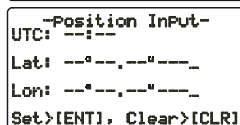
- a. Press the [**ENT**] key twice. The display looks like the illustration at the right.
- b. Enter your local UTC time, then press the [**ENT**] key.
- c. Enter the latitude/longitude of your vessel, then press the [**ENT**] key. To select North (N) press the [**6(NAV)**] key, South (S) press the [**7(SCRM)**] key, East (E) press the [**3(SCAN)**] key or West (W) press the [**9(FOG)**] key.
- d. To store the data entered, press and hold the [**ENT**] key.




```
DISTRESS ALERT
↳Undesignated
Press and hold [DIST]
5 sec to transmit
Nature of [DIAL]
Pos[ENT],Cancel[CLR]
```

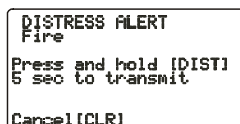


```
DISTRESS ALERT
↳Fire
Press and hold [DIST]
5 sec to transmit
Nature of [DIAL]
Pos[ENT],Cancel[CLR]
```



```
-Position Input-
UTC: --:--
Lat: --°--'--"---
Lon: --°--'--"---
Set>[ENT], Clear>[CLR]
```

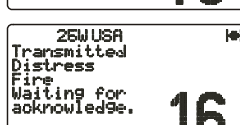
4. Press and hold the [**DISTRESS**] key. The radio’s display counts down (5-4-3-2-1) and then the distress call is transmitted. The backlight of the LCD and keypad flash during the countdown.
5. When the distress signal is sent, CH70 and “” icon appear on the LCD.
6. The transceiver will watch for a DSC acknowledgment transmission on CH70 and also receive calls on CH16.
7. When a DSC Distress acknowledgment is received, a distress alarm sounds and channel 16 is automatically selected. The LCD shows the MMSI of the ship responding to your distress.



```
DISTRESS ALERT
Fire
Press and hold [DIST]
5 sec to transmit
Cancel[CLR]
```



```
25WUSA
Transmitting
Distress
Fire
70
```



```
25WUSA
Transmitted
Distress
Fire
Waiting for
acknowledge.
Cancel[CLR]
16
```

RECEIVED ACK: Acknowledgment signal is received.

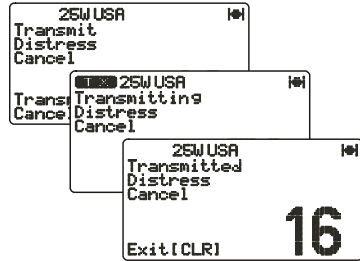
RECEIVED RLY ACK: Relay acknowledgment signal is received from another vessel or coast station.

8. To cancel the DSC distress alarm signal from the speaker, press any key.

### Cancel a DSC Distress Call

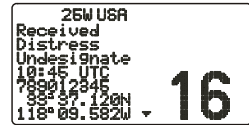
If a DSC Distress call was sent by error, the **FM-4000** allows you to send a message to other vessels to cancel the Distress call.

Press the **[CLR]** key, then press the **[ENT]** key.



### 11.3.2 Receiving a DSC Distress Call

1. When a DSC Distress call is received, an emergency alarm sounds.  
Then CH16 is automatically selected.
2. Press any key to stop the alarm.
3. The LCD shows the position of the vessel in distress.
4. If the distress data does not include latitude/longitude position, the display shown right appears.



#### **NOTE**

You must continue monitoring CH16 as a coast station may require assistance in the rescue attempt.

### **11.4 ALL SHIPS CALL**

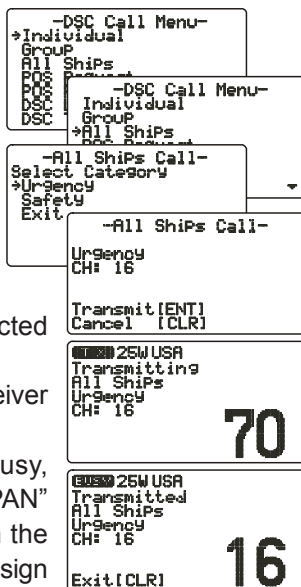
The All Ships call function allows contact to be established with other vessel stations without having their ID in the individual calling directory. Also, priority for the call can be designated as Urgency or Safety.

**URGENCY Call:** This type of call is used when a vessel may not truly be in distress, but have a potential problem that may lead to a distress situation. This call is the same as saying “PAN PAN PAN” on CH16.

**SAFETY Call:** Transmit boating safety information to other vessels. This message usually contains information about an overdue boat, debris in the water, loss of a navigation aid or an important meteorological message. This call is the same as saying “Securite, Securite, Securite.”

### 11.4.1 Transmitting an All Ships Call

1. Press the [CALL(MENU)] key to show the “DSC Call Menu.”
2. Turn the CHANNEL selector knob to select “All Ships.”
3. Press the [ENT] key. (To cancel, turn the CHANNEL selector knob to select “Exit.”)
4. Turn the CHANNEL selector knob to select the nature of call (“Urgency” or “Safety”), then press the [ENT] key.
5. Press the [ENT] key again to transmit the selected type of All Ships call.
6. After the All Ships call is transmitted, the transceiver switches to CH16.
7. Listen to the channel to make sure it is not busy, then key the microphone and say “PAN PAN PAN” or “Securite, Securite, Securite” depending on the priority of the call. Then announce both your call sign and the channel you wish to switch to for communications.



### 11.4.2 Receiving an All Ships Call

1. When an All Ships call is received, an emergency alarm sounds. The radio will automatically change to CH16 and the LCD shows the MMSI of the vessel transmitting the All Ships call.
2. Press any key to stop the alarm.
3. Monitor CH16 or traffic channel until the Urgency voice communication is completed.



## 11.5 INDIVIDUAL CALL

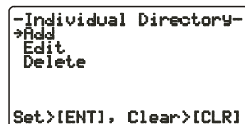
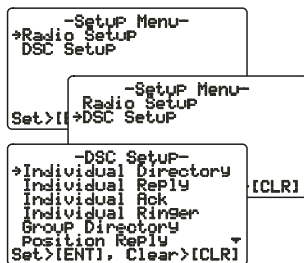
This feature allows the **FM-4000** to contact another vessel with a DSC VHF radio and automatically switch the receiving radio to a desired communications channel. This feature is similar to calling a vessel on CH16 and requesting to go to another channel (switching to the channel is private between the two stations).

### 11.5.1 Setting up the Individual / Position Call Directory

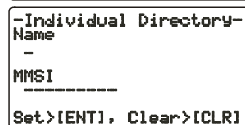
The **FM-4000** has a DSC directory that allows you to store a vessel or person’s name and the MMSI number associated with vessels you wish to transmit Individual calls, position requests and position send transmissions.

To transmit an Individual call you must program this directory with information of the persons you wish to call, similar to the telephone directory of a cellular phone.

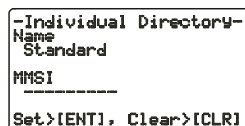
1. Press and hold down the [CALL(MENU)] key until the "Radio Setup" menu appears.
2. Turn the CHANNEL selector knob to select the "DSC Setup" menu.
3. Press the [ENT] key, then use the CHANNEL selector knob to select "Individual Directory."
4. Press the [ENT] key.
5. Select "Add" with the CHANNEL selector knob, then press the [ENT] key.
6. Press applicable key to enter the first letter of the name of the vessel or person you want to reference in the directory.



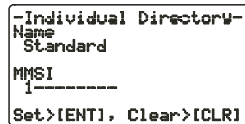
*Example:* Press the [2(MEM)] key repeatedly to toggle among the seven available characters associated with that key: 2 → A → B → C → a → b → c → 2 ... If you enter a wrong character, press the [CLR] key to delete the wrong character.



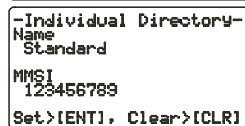
7. Press the [ENT] key to store the first letter in the name and move to the next letter to the right.
8. Repeat steps 6 and 7 to complete the name. The name can consist of up to 11 characters. If you do not use all 11 characters press the [ENT] key to move to the next space. This method can also be used to enter a blank space in the name. If you enter a wrong character, press the [H/L] key until the wrong character is selected, then enter the correct character.
9. After the 11th letter or space has been entered, press and hold the [ENT] key to advance to the MMSI (Maritime Mobile Service Identity Number) number entry.



10. Enter the desired number. If you enter a wrong number, press the [H/L] key until the wrong number is selected, then enter the correct number.
11. To store the data entered, press and hold the [ENT] key.



12. To enter another individual address, repeat steps 5 through 11.
13. Press the [CLR] key twice to return to the "Radio Setup" menu, then press the [CLR] key again to return to radio operation.

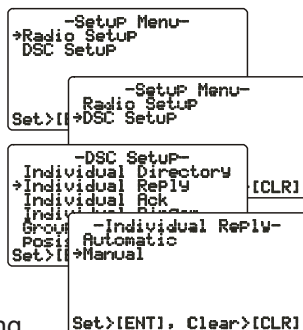




### 11.5.2 Setting up Individual Reply

Allows setting up the radio to automatically (default setting) or manually respond to a DSC Individual call requesting you to switch to a working channel for voice communications. When Manual is selected, the MMSI of the calling vessel is shown, allowing you to see who is calling. This function is similar to the caller ID on a cellular phone.

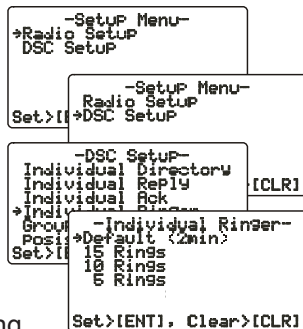
1. Press and hold down the [CALL(MENU)] key until the "Radio Setup" menu appears.
2. Turn the CHANNEL selector knob to select "DSC Setup" menu.
3. Press the [ENT] key, then use the CHANNEL selector knob to select "Individual Reply."
4. Press the [ENT] key.
5. Turn the CHANNEL selector knob to select "Automatic" or "Manual."
6. Press the [ENT] key to store the selected setting.
7. Press the [CLR] key twice to return to the "Radio Setup" menu, then press the [CLR] key again to return to radio operation.



### 11.5.3 Setting up Individual/Group Call Ringer

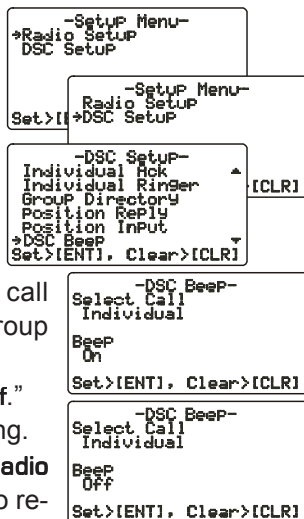
When an Individual call or Group call is received the radio will produce a ringing tone for two minutes. This selection allows the Individual call ringer time to be changed.

1. Press and hold down the [CALL(MENU)] key until "Radio Setup" menu appears.
2. Turn the CHANNEL selector knob to select "DSC Setup" menu.
3. Press the [ENT] key, then use the CHANNEL selector knob to select "Individual Ringer."
4. Press the [ENT] key.
5. Turn the CHANNEL selector knob to select ringing time for an Individual call.
6. Press the [ENT] key to store the selected setting.
7. Press the [CLR] key twice to return to the "Radio Setup" menu, then press the [CLR] key again to return to radio operation.



The Individual call and Group call ringers can be disabled as follows:

1. Press and hold down the [CALL(MENU)] key until “Radio Setup” menu appears.
2. Turn the **CHANNEL** selector knob to select the “DSC Setup” menu.
3. Press the [ENT] key, then use the **CHANNEL** selector knob to select “DSC Beep.”
4. Press the [ENT] key.
5. Turn the **CHANNEL** selector knob to select “Individual” if you wish to disable the Individual call ringer, or “Group” if you wish to disable the Group call ringer and press the [ENT] key.
6. Turn the **CHANNEL** selector knob to select “Off.”
7. Press the [ENT] key to store the selected setting.
8. Press the [CLR] key twice to return to the “Radio Setup” menu, then press the [CLR] key again to return to radio operation.



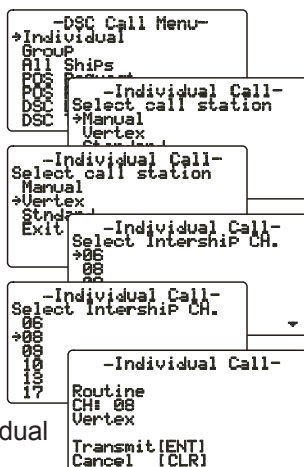
To enable the Individual or Group ringer tone, select “On” in step “6” in this procedure.

### 11.5.4 Transmitting an Individual Call

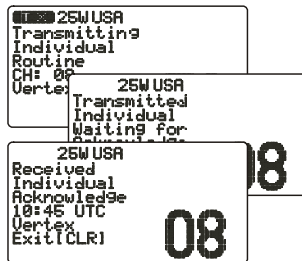
The Individual call feature allows you to contact another vessel that has a DSC radio. This feature is similar to calling a vessel on CH16 and requesting to go to another channel.

#### Using Pre-Programmed Vessel

1. Press the [CALL(MENU)] key to show the “DSC Call Menu”.
2. Turn the **CHANNEL** selector knob to select “Individual.” (To cancel, press the [CLR] key.)
3. Press the [ENT] key. The transceiver beeps then the “Individual directory” appears.
4. Turn the **CHANNEL** selector knob to select the “Individual” you want to contact.
5. Press the [ENT] key, then turn the **CHANNEL** selector knob to select the operating channel you want to communicate on, then press the [ENT] key.
6. Press the [ENT] key again to transmit the individual DSC signal.



- When an Individual call acknowledgment is received, the channel selected at step 5 is automatically selected and a ringing tone sounds.
- Press [CLR] key to listen to the channel to make sure it is not busy, then key the microphone to call the other vessel.



### Manual Calling

You may enter an MMSI number manually to contact a vessel which is not stored in the Individual Directory.

- Press the [CALL(MENU)] key to show the "DSC Call Menu."
- Turn the **CHANNEL** selector knob to select "Individual." (To cancel, press the [CLR] key.)
- Press the [ENT] key. The transceiver beeps then the "Individual directory" appears.
- Turn the **CHANNEL** selector knob to select "Manual," then press the [ENT] key.
- Enter the MMSI number (nine digits) which you want to contact, then press the [ENT] key.
- If you enter the wrong number in the MMSI number, press the [H/L] key until the wrong number is selected, then enter the correct number.
- When you are finished entering the MMSI number, press and hold the [ENT] key.
- Turn the **CHANNEL** selector knob to select "Manual," then press the [ENT] key.
- Turn the **CHANNEL** selector knob to select the operating channel you want to communicate on, then press the [ENT] key.
- Press the [ENT] key again to transmit the individual DSC signal.
- When an Individual call acknowledgment is received, the channel selected at step 5 is automatically selected and a ringing tone sounds.
- Press the [CLR] key to listen to the channel to make sure it is not busy, then key the microphone to call the other vessel.

