Thank you for purchasing a CobraMarine® VHF radio. Properly used, this Cobra® product will give you many years of reliable service.

How Your CobraMarine VHF Radio Works
This radio is a VHF transceiver for fixed mounting on your boat. It gives you 2-way vessel-to-vessel and vessel-to-shore station communications, primarily for safety and secondarily for navigation and operational purposes. With it, you can call for help, get information from other boaters, talk to lock or bridge tenders and make radiotelephone calls to anywhere in the world through a marine operator.

Besides 2-way communications, in the U.S.A., the radio can provide quick access to receive eight NOAA (National Oceanographic and Atmospheric Administration) and two Canadian weather channels for alerting you to weather emergencies with a tone on a weather channel you can select for your area.

Customer Assistance
Should you encounter any problems with this product, or not understand its many features, please refer to this owner’s manual. If you require further assistance after reading this manual, Cobra Electronics offers the following customer assistance services:

For Assistance In The U.S.A.
Automated Help Desk English only.
24 hours a day, 7 days a week 773-889-3087 (phone).

Customer Assistance Operators English and Spanish.
8:00 a.m. to 5:30 p.m. Central Time Mon. through Fri. (except holidays) 773-889-3087 (phone).

Questions English and Spanish.
Faxes can be received at 773-622-2269 (fax).

Technical Assistance English only.
English and Spanish. productinfo@cobra.com (e-mail).

For Assistance Outside The U.S.A.
Contact Your Local Dealer

©2015 Cobra Electronics Corporation
6500 West Cortland Street
Chicago, Illinois 60707 USA
www.cobra.com
Product Features

Rewind-Say-Again®
Replay missed VHD calls. Automatically records the last 20 seconds of incoming radio transmissions. Great when in noisy conditions.

Dual Power
Selectable to one (1) or 25 watts output power for near or distant calling.

USA/International/Canada Channels
 Allows operation on any of the three (3) different channel maps established for these areas.

All NOAA Weather Channels
Instant access to all of the National Weather Channels, 24 hours a day.

Emergency Weather Alert
Can alert you with an audible tone and visual alarm if threatening weather is nearby.

Instant Channel 16/9
Instant access to the priority Channel 16 and calling Channel 9.

Digital Selective Calling (DSC Class-D)
Allows the ability to maintain a listening watch on VHF Channel 16 while simultaneously monitoring Channel 70 for DSC calls. Allows sending a distress message at the touch of a button as well as specific station-to-station calls. Radio utilizes two (2) built-in encoders (receivers).

Memory Scan
Lets you scan through all selected memory channels to find conversations in progress.

Tri-Watch
Lets you monitor three (3) channels at once — Channel 16, Channel 9, and one (1) user selectable channel.

Noise Canceling Microphone
Blocks background noise to let your voice be heard at the receiving station.

Illuminated Buttons
Helps you quickly find the buttons you need in low light conditions.

Mounting Kits Included
Radio can be mounted on, under, or in almost any flat surface using one (1) of the included brackets.

Waterproof
Submersible to (1.5) meters of water for 30 minutes - meets IPX8/JIS8 Standards.
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Important Safety Information

Before installing and using your CobraMarine VHF radio, please read these general precautions and warnings.

Warning And Notice Statements
To make the most of this radio, it must be installed and used properly. Please read the installation and operating instructions carefully before installing and using it. Special attention must be paid to the WARNING and NOTICE statements in this manual.

**WARNING**
Statements identify conditions that could result in personal injury or loss of life.

**NOTICE**
Statements identify conditions that could cause damage to the radio or other equipment.

Safety Training Information
This CobraMarine radio is designed for and classified as “Occupational Use Only.” It must only be used in the course of employment by individuals aware of both the hazards and the ways to minimize those hazards. This radio is NOT intended for use in an uncontrolled environment by the “General Population.”


The following **WARNINGS** and **NOTICES** will make you aware of RF exposure hazards and how to assure you operate the radio within the FCC RF exposure limits established for it.

**WARNINGS**
Your radio generates electromagnetic RF (radio frequency) energy when it is transmitting. To ensure that you and those around you are not exposed to excessive amounts of that energy, **DO NOT** touch the antenna when transmitting. **KEEP** the radio at least two (2) inches (5 cm) away from yourself and others when transmitting. SEE page 20 in the antenna requirements section for further information.

**DO NOT** operate the radio without a proper antenna or equivalent dummy load attached. Doing so may expose you to excessive RF energy and will damage the radio.

**DO NOT** transmit more than 50% of the time the radio is in use — 50% duty cycle. The radio is transmitting when the Talk button is pressed and the transmit information shows on the LCD screen.

**ALWAYS** use only Cobra authorized accessories.

**NEVER** connect the transceiver to AC power. It can be a fire hazard, may cause an electric shock, and may damage the transceiver.

**NEVER** mount the transceiver or microphone where they might interfere with operation of your vessel or cause injury.

**DO NOT** allow children or anyone unfamiliar with proper procedures to operate the radio without supervision.

Failure to observe any of these warnings may cause you to exceed FCC RF exposure limits or create other dangerous conditions.

**NOTE**
Throughout this manual, the term “Transceiver” will be used to identify the main unit containing the LCD screen and controls. The term “Radio” will be used to identify the entire equipment including transceiver, microphone, antenna and any attached external speakers.
Recommendations For Marine Communication

The frequencies your radio uses are set aside to enhance safety afloat and for vessel navigation and operational messages over a range suitable for nearshore voyages. If the 25 watt maximum output of your radio isn’t sufficient for the distances you travel from the coast, consider installing more powerful radio equipment such as HF single side band or satellite radio for your vessel.

The U.S. Coast Guard does not endorse cellular telephones as substitutes for marine radios. They generally cannot communicate with rescue vessels and, if you make a distress call on a cellular telephone, only the party you call will be able to hear you. Additionally, cellular telephones may have limited coverage over water and can be hard to locate. If you don’t know where you are, the Coast Guard will have difficulty finding you if you’re using a cellular telephone.

However, cellular telephones can have a place on board where cellular coverage is available — to allow social conversations and keep the marine frequencies uncluttered and available for their intended uses.
Radio Call Sign
Currently, the FCC does not require recreational boaters to have a license. The United States Coast Guard recommends that the boat’s registration number and state of registry (e.g., IL 1234 AB) be used as a call sign and be clearly visible on the vessel.

Canadian Ship Station License
You need a Radio Operator’s Certificate if your vessel is operated in Canadian waters. Radio Operator training and certification is available from the Canadian Power Squadron. Visit their website (http://www.cps-ecp.ca/english/newradiocard.html), contact the nearest field office or write: Industry of Canada, Radio Regulatory Branch, Attn: DOSP, 300 Slater Street, Ottawa, Ontario, Canada K1A 0C8.

User Responsibility And Operating Locations
All users are responsible for observing domestic and foreign government regulations and are subject to severe penalties for violations. The VHF frequencies on your radio are reserved for marine use and require a special license to operate from land, including when your boat is on its trailer.

NOTE
This device complies with part 15 of the FCC Rules. Operation is subject to the following two (2) 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.

FCC Warnings: Replacement or substitution of transistors, regular diodes, or other parts of a unique nature, with parts other than those recommended by Cobra® may cause a violation of the technical regulations of part 80 of the FCC Rules, or violation of type acceptance requirements of part 2 of the rules.

VHF Marine Radio Procedures

Maintain Your Watch
Whenever your boat is underway, the radio must be turned On and be tuned to Channel 16, except when being used for messages.

Power
Try 1 watt first if the station being called is within a few miles. Try a second call after waiting two (2) minutes. If there is no answer, switch to a higher power. This will conserve your battery and minimize interference to other users by avoiding repeated calls.

Calling Coast Stations
Call a coast station on its assigned channel. You may use Channel 16 when you do not know the assigned channel.

Calling Other Vessels
Call other vessels on Channel 16 or on Channel 9. (Channel 9 is preferred for recreational vessel use.) You may also call on ship-to-ship channels when you know that the vessel is listening on a ship-to-ship channel.

Initial Calling on Channel 16 or 9
The use of Channel 16 is permitted for making initial contact (hailing) with another vessel. The limits on calling must be followed. Be reminded, Channel 16’s most important function is for Emergency Messages. If, for some reason, Channel 16 is congested, the use of Channel 9, especially in U.S. waters, may be used as the initial contact (hailing) channel for non-emergency communication.

Limits On Calling
You must not call the same station for more than 30 seconds at a time. If you do not get a reply, wait at least two (2) minutes before calling again. After three (3) calling periods, wait at least 15 minutes before calling again.

Change Channels
After contacting another station on a calling channel, change immediately to a channel which is available for the type of message you want to send.

Station Identification
Identify, in English, your station by your FCC call sign, ship name, the state registration number, or other official number at both the beginning and end of each message.

Prohibited Communications
You MUST NOT transmit:
- False distress or emergency messages.
- Messages containing obscene, indecent, or profane words or meaning.
- General calls, signals, or messages (messages not addressed to a particular station) on Channel 16, except in an emergency or if you are testing your radio.
- When you are on land.

Voice Calling
To Call Another Vessel Or A Shore Installation Such As A Lock Or Bridge Tender:
- Make sure your radio is On.
- Select Channel 16 and listen to make sure it is not being used.

NOTE
Channel 9 may be used by recreational vessels for general-purpose calling. This frequency should be used whenever possible to relieve congestion on Channel 16.
- When the channel is quiet, press the Talk button and call the ship you wish to call. (Hold the microphone a few inches from your face and speak clearly and distinctly.) Say “[name of station being called] THIS IS [your vessel’s name or call sign].”
- Once contact is made on the calling channel, you must switch to a proper working channel. See the channel listing on page 66 through 78.
Digital Selective Calling (DSC)

Digital selective calling is a semi-automated system for establishing a radio call. It has been designed by the International Maritime Organization (IMO) as an international standard for VHF, MF, and HF calls and is part of the Global Maritime Distress and Safety System (GMDSS).

DSC will eventually replace aural (listening) watches on distress frequencies and will be used to announce routine and urgent maritime safety information broadcasts. Until DSC is fully implemented, it is still necessary to maintain a listening watch on Channel 16.

The DSC system allows mariners to instantly send a distress call with GPS position coordinates (requires a GPS receiver to be connected to the radio) to the Coast Guard and other vessels within range of the transmission.

DSC also allows mariners to initiate and receive distress, urgent, safety, routine, position request, position send, and group calls between vessels equipped with DSC capable radios.

Maritime Mobile Service Identity (MMSI)

The MMSI Number Is Available In The U.S.A. From Any Of Two (2) Sources:

- U.S. Power Squadron www.usps.org

NOTE

The above references are for recreational vessels only. Commercial vessels should contact the FCC.

An MMSI is a nine (9) digit number used on a marine radio capable of using digital selective calling (DSC). It is used to selectively call other vessels or shore stations and is similar to a telephone number.

For your CobraMarine™ radio to operate in the DSC mode, you must enter your maritime mobile service identity (MMSI) number. See page 41 for instructions on how to enter it.

In Canada, Contact:


To Obtain An MMSI Number Outside The U.S.A.:

Users can obtain an MMSI from their country’s telecommunications authority or ship registry. This may involve amending or obtaining a ship station license.

WARNING

This equipment is designed to generate a digital maritime distress and safety signal 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 channel to distress and safety watch system. The range of the signal may vary, but under normal conditions should be approximately 20 nautical miles.

For Example

The vessel Corsair calling the vessel Vagabond:

Corsair: “Vagabond, this is Corsair (station license number call sign).”

Vagabond: “Corsair, this is Vagabond. Over.”

Corsair: “Vagabond go to working Channel 68. Over.”

Both parties switch over to the agreed upon working channel....

Corsair: “Vagabond I need to talk to you about... Over.”

Vagabond: “Corsair in answer to your question about... Over.”

Corsair: “Vagabond, thanks for the information about... (call sign and out).”

After each transmission, say “OVER” and release the microphone Push to Talk (PTT) button. This confirms that the transmission has ended. When all communication with the other vessel is totally completed, end the message by stating your call sign and the word “OUT.” Remember, it is not necessary to state your call sign with each transmission, only at the beginning and end of the message.

NOTE

For best sound quality at the shore station or other vessel receiving your call, hold the microphone/speaker at least 2 in. (51 mm) from your mouth and slightly off to one (1) side. Speak in a normal tone of voice.

DSC.


1-800-563-1536

CobraMarine, Inc.

1124 Bath Road

Columbus, OH 43230

www.cobramarine.com
Emergency Messages And Distress Procedure

The ability to summon assistance in an emergency is the primary reason to have a VHF marine radio. The marine environment can be unforgiving, and what may initially be a minor problem can rapidly develop into a situation beyond your control.

The Coast Guard monitors Channel 16, responds to all distress calls, and coordinates all search and rescue efforts. Depending on the availability of other capable vessels or commercial assistance operators in your vicinity, Coast Guard or Coast Guard Auxiliary craft may be dispatched.

In any event, do communicate with the Coast Guard as soon as you experience difficulties and before your situation becomes an emergency. Use the emergency message procedures only after your situation has become grave or you are faced with a sudden danger threatening life or property and requiring immediate help.

Use channel 16 to communicate your emergency message. Make sure you transmit on high power. If you are merely out of gas, do not send an emergency message. Drop your anchor and call a friend or marine to bring the fuel you need or to give you a tow.

Marine Emergency Signals

The three (3) spoken international emergency signals are:

- MAYDAY: The distress signal MAYDAY is used to indicate that a station is threatened by grave and imminent danger and requests immediate assistance.

- PAN: The urgency signal PAN is used when the safety of the vessel or person is in jeopardy. (This signal is properly pronounced pahn.)

- SECURITE: The safety signal SECURITE is used for messages about the safety of navigation or important weather warnings. (This signal is properly pronounced see-cure-it-tay.)

When using an international emergency signal, the appropriate signal is to be spoken three (3) times prior to the message.

If You Hear A Distress Call

You must give any message beginning with one (1) of these signals priority over any other messages. ALL stations MUST remain silent on Channel 16 for the duration of the emergency unless the message relates directly to the emergency.

If you hear a distress message from a vessel, stand by your radio. If it is not answered, YOU should answer. If the distressed vessel is not nearby, wait a short time for others who may be closer to acknowledge. Even if you cannot render direct assistance, you may be in a position to relay the message.
Marine Distress Procedure

Speak slowly — clearly — calmly.

1. Make sure your radio is On.

2. Select VHF Channel 16.

3. Press Talk button and say:
   “MAYDAY — MAYDAY — MAYDAY.”
   (Or “PAN — PAN — PAN,”
   or “SECURITE — SECURITE — SECURITE.”)

4. Say:
   “THIS IS [your vessel name or call sign].”

5. Say:
   “MAYDAY (or “PAN” or “SECURITE”)
   [your vessel name or call sign].”

6. Tell where you are:
   (what navigational aids or landmarks are near).

7. State the nature of your distress.

8. State the kind of assistance needed.

9. Give number of persons aboard and conditions of any injured.

10. Estimate present seaworthiness of your vessel.

11. Briefly describe your vessel (length, type, color, hull).

12. Say:
    “I WILL BE LISTENING ON CHANNEL 16.”

13. End message by saying:
    “THIS IS [your vessel name or call sign] OVER.”

14. Release Talk button and listen. Someone should answer.
    If not, repeat the call, beginning at item 3 above.

Keep the radio nearby. Even after your message has been received, the Coast Guard can find you more quickly if you can transmit a signal for a rescue boat to hone in on.

For Example

“Mayday — Mayday — Mayday”

“This is Corsair — Corsair — Corsair” [or “Illinois 1234 AB” three (3) times]

“Mayday Corsair (or Illinois 1234 AB)”

“Navy Pier bears 220 degrees magnetic — distance five (5) miles”

“Struck submerged object and flooding — need pump and tow”

“Four adults, three children aboard — no one injured”

“Estimate we will remain afloat one-half (½) hour”

“Corsair (or Illinois 1234 AB) is 26 foot sloop with blue hull and tan deck house”

“I will be listening on Channel 16”

“This is Corsair (or Illinois 1234 AB)”

“Over”

It is a good idea to write out a script of the message form and post it where you and others on your vessel can see it when an emergency message needs to be sent.

Marine Distress Procedure – DSC

Digital Selective Calling (DSC) is a semi-automated system that will allow you to press the Distress button from any routine to make a distress call. When the distress button is pressed, all other channels go to Standby mode and allow the digitally encoded “pre-programmed” message to take precedence. Important information such as your MMSI number, position and name will be transmitted on Channel 16. The distress alarm will sound for two (2) minutes or until the alarm is cleared.

The DSC system allows you to choose a “pre-programmed” distress call such as: “Man Overboard, Sinking, Collision.” There are many pre-programmed choices to choose from. If a GPS is connected to your radio, your coordinates will also be sent to the Coast Guard as well as to other vessels that are within range of the transmission. DSC calling also allows the user to initiate and receive distress, urgent, safety, routine, position request, position send and group calls between vessels equipped with DSC capable radios.

WARNING

This radio will generate a digital maritime distress and safety signal to help facilitate search and rescue. This radio must be used only within communication range of a shore based VHF station with a distress and safety watch system. The range of the signal may vary, however, under normal conditions should be approximately 20 nautical miles.
Included In This Package

You should find all of the following items in the package with your CobraMarine VHF radio:

<table>
<thead>
<tr>
<th>Item</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transceiver*</td>
<td><img src="image1" alt="Transceiver" /></td>
</tr>
<tr>
<td>Transceiver Flush Mount Kit</td>
<td><img src="image2" alt="Flush Mount Kit" /></td>
</tr>
<tr>
<td>Transceiver Surface Mount Kit</td>
<td><img src="image3" alt="Surface Mount Kit" /></td>
</tr>
<tr>
<td>Microphone</td>
<td><img src="image4" alt="Microphone" /></td>
</tr>
<tr>
<td>Microphone Mounting Kit</td>
<td><img src="image5" alt="Mounting Kit" /></td>
</tr>
<tr>
<td>Operating Instruction Manual</td>
<td><img src="image6" alt="Instruction Manual" /></td>
</tr>
<tr>
<td>Warning Sticker</td>
<td><img src="image7" alt="Warning Sticker" /></td>
</tr>
<tr>
<td>GPS Interface Cable</td>
<td><img src="image8" alt="GPS Interface Cable" /></td>
</tr>
</tbody>
</table>

Optional Accessories

You can find quality Cobra products and accessories at your local Cobra dealer, or in the U.S.A., you can order directly from Cobra.

Ordering From U.S.A.
Call 773-889-3087 for pricing or visit www.cobra.com.

For Credit Card Orders
Call 773-889-3087 [Press one from the main menu] 8:00 a.m. to 5:30 p.m. Central Time, Monday through Friday.

Make Check or Money Order Payable To
Cobra Electronics, Attn: Accessories Dept.,
6500 West Cortland Street, Chicago, IL 60707 U.S.A.

To Order Online
Please visit our website: www.cobra.com
Installation And Start-Up
Mounting And Powering The Radio

Mounting And Powering The Radio
Before using your CobraMarine VHF radio, it must be installed on your vessel.

Installing Your Radio
Choose a location for your radio where it will be conveniently accessible with the following factors in mind:
- The leads to the battery and the antenna are best kept as short as possible.
- The antenna must be mounted at least three (3) feet from the transceiver.
- The radio and all speakers need to be far enough from any magnetic compass to avoid deviation due to the speaker magnet.
- There needs to be free air flow around the heat-sink fins on the back of the transceiver.

Surface Mount
A Surface Mounting kit is included with your CobraMarine VHF radio to allow its installation on almost any flat surface.

To Mount The Transceiver On Almost Any Flat Surface:
1. Use the mounting bracket as a template to drill holes for the mounting screws.
2. Attach the mounting bracket to the chosen surface.
3. Attach the transceiver to the mounting bracket with the locking knobs.
4. Tilt the transceiver to a convenient angle and tighten the locking knobs.

Flush Mount
A Flush Mounting kit is included with your CobraMarine VHF radio to allow its installation in almost any flat surface.

To Mount The Transceiver Flush In Almost Any Flat Surface:
1. Use the supplied template to mark and cut an opening in the flat surface. See page 85 for template.
2. Insert the transceiver into the opening.
3. Attach the flush mounting brackets to the sides of the transceiver with the adjusting screw flanges facing the back of the flat surface.
4. Tighten the adjusting screws against the back of the flat surface until the flange on the front of the transceiver is tight against the flat surface.

Microphone Bracket
To Install The Microphone Bracket:
1. Install the microphone bracket on a vertical surface near the transceiver using the supplied stainless steel screws.

CAUTION
Before cutting, be sure the area behind the flat surface is clear of any instruments or wires that might be damaged in the process.
Warning Sticker
FCC regulations require that the Warning Sticker supplied with this radio be applied to a spot where it is easily seen by the radio operator. Be sure the location is clean and dry before applying the sticker.

Electrical Power Connection
Your CobraMarine VHF radio is powered from the vessel’s 13.8-volt negative ground direct current electrical system (12-volt nominal). A fused power connection lead is provided at the back of the transceiver.

To Connect To A Power Source:
1. Attach the black (-) wire to a negative (-) ground.
2. Attach the fused red power (+) wire to the positive (+) side of the power system.

NOTE
This radio will draw up to 8 amps when transmitting at full power.

NOTICES
A reverse polarity connection will damage the radio.
When replacing the fuse in your transceiver, use only the size and type originally provided.

<table>
<thead>
<tr>
<th>Length</th>
<th>Wire Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1.5m (4.9 ft)</td>
<td>1.6 mils (#14)</td>
</tr>
<tr>
<td>Up to 3.0m (9.8 ft)</td>
<td>2.0 mils (#12)</td>
</tr>
<tr>
<td>Up to 5.0m (16.4 ft)</td>
<td>2.6 mils (#10)</td>
</tr>
<tr>
<td>Up to 6.0m (19.7 ft)</td>
<td>3.3 mils (#8)</td>
</tr>
</tbody>
</table>
Antenna Requirements and Attachment

Antenna Requirements

Your CobraMarine VHF radio requires an external marine antenna to send signals into the air and to receive them. The radio is arranged to use any of the popular marine VHF antennas, but it is up to you to choose which antenna to use.

Since it represents the link between your radio and the outside world, Cobra® suggests you purchase the best quality antenna, coaxial cable, and connectors you can. This is best accomplished with the advice and guidance of a knowledgeable dealer who can assess the variables involved with your particular boat and preferences.

WARNING

Compliance with FCC requirements for Radio Frequency Exposure is the responsibility of both the antenna installer and the radio operator.

Safe Maximum Permissible Exposure (MPE) Radius

To avoid health hazards from excessive exposure to RF energy, FCC OET Bulletin 65 establishes an MPE radius of 10' (3 m) for the maximum power of your radio with an antenna having a maximum power gain of 9 dBi. This means that all persons must be at least 10’ (3 m) away from the antenna when the radio is transmitting.

Installation Requirements

A) An omnidirectional antenna with a gain not greater than 9 dBi must be mounted at least 16.4’ (5 m) above the highest deck where people may be during radio transmissions, measured vertically from the lowest point of the antenna. This provides the minimum separation distance to comply with RF exposure requirements and is based on the MPE radius of 10’ (3 m) plus the 6.6’ (2 m) height of an adult.

B) For vessels without structure to mount the antenna as described in A, it must be mounted as follows AND all persons must be outside the 10’ (3 m) MPE radius during radio transmissions. The antenna must be mounted so that its lowest point is at least 3.3’ (1 m) vertically above the heads of all persons during radio transmissions.

Radio Operator Requirements

Do not transmit when anyone is within the MPE radius of the antenna unless that person or persons are shielded from the antenna by a grounded metallic barrier. This is especially important on vessels with antennas mounted as described in B where no one may be within 9’ (2.8 m) horizontally from the base of the antenna during transmissions.

FAILURE TO OBSERVE THE ABOVE LIMITS MAY EXPOSE THOSE WITHIN THE MPE RADIUS TO RF ENERGY ABSORPTION IN EXCESS OF THE FCC MAXIMUM PERMISSIBLE EXPOSURE. IT IS THE RADIO OPERATOR’S RESPONSIBILITY TO INSURE THAT MPE LIMITS ARE HEEDED AND THAT NO ONE IS WITHIN THE MPE RADIUS DURING TRANSMISSIONS.

Antenna Lead Attachment

Once the antenna is installed, the Coaxial Cable Lead can be attached to the socket at the back of the transceiver.

CAUTION

Attempting to transmit without an antenna attached will damage your CobraMarine VHF radio.
External Devices And Connections

Your CobraMarine VHF radio is set up to connect auxiliary devices for navigation, convenience, and added versatility. As is the case with the antenna, choosing these devices is best done with the advice and guidance of a knowledgeable dealer. Standard connectors are provided on the front and back of the transceiver.

External Speaker (Not Included)

An External Speaker can provide greater volume to hear messages than the speaker incorporated in the CobraMarine microphone/speaker.

To Install An External Speaker:
1. Connect the wires to the External Speaker as follows:
   - Orange wire - +Positive connection
   - Black wire - -Negative connection (Black wire is common shared -Negative for the External Speaker and PA output)
2. Make sure to solder, crimp, or twist the wires together firmly and use shrink tubing or electrical tape to waterproof the connection.

Public Address Speaker (Not Included)

At times, it may be handy to hail other boats or give instructions to line handlers on the dock. Your CobraMarine VHF radio can be switched to operate in the Public Address mode through an attached PA speaker.

To Install A Public Address Speaker:
1. Connect the wires to the External Speaker as follows:
   - Red wire - +Positive connection
   - Black wire - -Negative connection (Black wire is common shared -Negative for the External Speaker and PA output)
2. Make sure to solder, crimp, or twist the wires together firmly and use shrink tubing or electrical tape to waterproof the connection.

Global Positioning System (GPS) Device (Not Included)

Your Cobra Marine radio does not include a built-in GPS receiver. After connecting an external GPS receiver, your position will be continuously indicated on the LCD and, most importantly, it will be included automatically with any DSC Distress message you may need to send. That will take the “search” out of “search and rescue.

An external GPS input connector has been provided to allow connection to a back-up GPS receiver.

To Install A GPS Device:
1. Install the GPS device in a convenient location according to its manufacturer’s directions.
2. Plug-in the optional Cobra C.P.S. (Cobra Positioning System) into the provided 2.5mm jack.
3. Or using the supplied 2-wire adapter wire as follows:
   - Yellow wire - NMEA 0183 +Data in
   - Green wire - NMEA 0183 -Data in.

**NOTE**

Satellite acquisition time is dependent on the antenna mounting location. If the acquisition takes too long, relocate the radio or use an external GPS receiver.
Getting Started

Refer to the foldout on the front cover of this manual to identify the various controls and indicators on your radio. Throughout this manual you will be instructed to press or to press and hold buttons on the transceiver. Press means a momentary press, then release; press and hold means to hold the button.

Tones And Alarms

When your CobraMarine VHF radio is on, you can expect to hear the following tones and alarms. The volume of these sounds is controlled by the circuitry in the radio and is not affected by the volume set with the On-Off Power/Volume knob.

Confirmation Tone
Single high-pitched beep confirms all button presses except the Talk button. It can be turned on or off. See set-up routines on page 30.

Error Tone
Three low-pitched beeps indicates an invalid button press.

DSC Distress Alarm
High—low—high—low—high. Pause, then repeat. The volume of all alarms will increase after 10 seconds. Press any button to turn it off.

NOTE
This alarm sounds only for DSC distress calls on Channel 70. It does not sound for voice calls on Channel 16 — you still must listen for those.

Distress Acknowledgement Alarm
High—low—high—low—high. Pause, then repeat. The volume of all alarms will increase after 10 seconds. Press any button to turn it off.

DSC Routine Call Alarm
High—pause—high—pause—high. Long pause, then repeat. Press any button to turn it off.

DSC Geographical Alarm
Loud, continuous, medium-pitched, high-low tones (warble) — sounds when a geographical call is received. Press any button to turn it off.

DSC Position Request Alarm
Medium-loud, continuous, low-pitched series of closely spaced, four (4) beeps [three (3) short – one (1) long] groups — sounds when a position request call is received. Press any button to turn it off.

DSC Individual Alarm
High—pause—high—pause—high. Long pause, then repeat. Press any button to turn it off.

Weather Alarm

Medium-loud, continuous, medium-pitched series of one-half (½) second beeps spaced one-half (½) second apart — sounds when weather alert is turned on and NOAA sends a 1050 Hz weather alert tone on the selected weather channel. Press any button to turn it off.

Power On-Off

Transceiver power can be turned on or off by the On-Off Power/Volume knob on the transceiver.

To Turn Your Radio On Or Off:
1. Rotate the Off Power/Volume knob clockwise to turn on the transceiver. To turn off the transceiver, rotate the Off Power/Volume counter clockwise until a “click” is heard.

When the radio is powered on, the confirmation tone will sound.

The radio will return to the settings in effect when it was last powered off, the LCD will show the corresponding information, and all controls will be operative. The radio will then be in Standby mode.

Volume

The On-Off Power/Volume knob on the transceiver controls the speaker volume. The volume adjustment applies only to what you hear from the speaker and does not affect the volume of your outgoing messages. That is controlled by the circuitry of your radio. The volume bar graph will be shown to indicate the volume setting. 2 seconds after finishing the volume adjustment, the radio will return to the Standby mode.

To Increase The Volume:
• Turn the On-Off Power/Volume knob clockwise.

To Decrease The Volume:
• Turn the On-Off Power/Volume knob counter-clockwise.

Squelch

Squelch control filters weak signals and radio frequency noise so that you can more clearly hear the signals you want. You can think of it as a variable barrier that blocks what you don’t want to hear.
Getting Started

To Squelch Your Radio:

1. With the Squelch knob turned fully counter-clockwise, turn the On-Off/Volume knob clockwise until you hear a hissing (noise) sound.

2. Turn the Squelch knob clockwise until the hissing sound stops.

Turning the Squelch knob further clockwise (higher barrier) will filter weak and medium strength signals until only the strongest signal can get through at the highest squelch setting. The Squelch bar graph will be shown to indicate the Squelch setting. 2 seconds after finishing the Squelch adjustment, the radio will return to the Standby mode.

To Receive Weaker Signals:

1. Turn the Squelch knob counterclockwise (lower barrier).

If the squelch is set so that you can hear a continuous hissing sound, the memory scan and tri-watch functions will be blocked.

Standby And Receive

Standby mode is the usual mode for the radio whenever it is turned On.

From Standby Mode, You Can:

- Change your radio’s settings using set-up routines.
- Receive messages on the current channel as well as DSC messages.
- Listen and Receive NOAA alerts if Weather Alert mode is turned On.
- Switch to Transmit mode using the Talk button.

While the radio is in Standby mode, the Receive mode is entered whenever a strong enough signal to break squelch is sent to the radio. You will hear the message through whichever speakers are connected to the radio.

To Change The Channel You Are Listening To, You Can Choose One Of The Following:

a. Press the Up/Down buttons. This will take you to the next higher or lower VHF channel. For rapid advance, press and hold the Up or Down button.

b. Press the Channel 16/9 button. This will take you to Channel 16 with one (1) press and to Channel 9 with a second press. Additional presses will toggle between Channels 16 and 9 and the current user selected channel.

c. To listen to the Weather Radio press the WX (Weather) soft key. This will activate the weather radio mode. When in the Weather mode, the Up/Down buttons will change the weather channel.

d. Press and release the Back softkey to return the radio to Standby Mode.

HI/LO Transmit Setting

Transmit Power Output

Your radio can Transmit selectively at one (1) or 25 watts of power. Cobra® suggests you maintain the low power setting for short-range communications and to avoid overpowering nearby stations with your signal. Use the high power setting for long-range communications or when you do not receive a response to a signal sent at one (1) watt.

To Toggle Between The High And Low Power Modes:

1. Press the High/Low Power button. The LCD will show which mode is in effect.

Some channels are restricted to use at a maximum of one (1) watt. Your radio will automatically set the power to Low Power mode when you select those channels.

While using the U.S.A. channel map, if, in an emergency, you need to increase the output power on Channel 13 and Channel 67 for your signal to be heard, you can override the Low Power mode by pressing and holding the High/Low Power button.

Transmit a Message

1. Check to see that your unit is set to a proper channel for the type of message you plan to send.

2. Toggle to the low power setting.

3. With the microphone about two (2) inches [five (5) cm] from your mouth, press and hold the Talk button and speak into the microphone. Transmit will be indicated on the LCD.

4. Release the Talk button when you are finished speaking. Your unit can only operate in either the Transmit or the Receive mode at any given time. You will not hear the response to your message unless the Talk button is released.

NOTE

If the Talk button is held down for five (5) minutes, the radio will automatically cease transmitting to prevent unwanted signal generation. As soon as the Talk button is released, it can be pressed again to resume transmission.
Operating Your Radio

Set-Up Routines

The Settings menu in the CobraMarine VHF radio allows you to turn On and Off many of its features, to adjust other features to suit your preferences, and to enter your user MMSI number.

To Enter The Settings Menu:

1. Press the Menu button. The Settings menu will appear on the LCD.

After entering the Settings menu, you can scroll through it to make as many entries as you like. Whenever the setting selection highlight appears in a feature portion of the menu, it will highlight the setting that was in effect when you entered the menu.

When you are finished with changes, you can exit the Settings menu by pressing the Exit soft key and return to Standby mode.

To Change The Contrast:

- Press the Menu button. The Settings menu will appear on the LCD.
- Use the Up/Down buttons to scroll down to CONTRAST level setting — a number between one 0 and 16.
- Press the EXIT soft key to select a contrast level. Or press the EXIT soft key to EXIT without making changes to the Contrast setting.

The radio will return to the Settings menu. The radio will remember the saved backlight setting, when powering off the radio, or disconnecting power to the radio.

NOTE

Basic set-up routines are described here. For set-up routines that apply specifically to a particular function, they are included in the section for that function.

LCD Backlight

The LCD has a Backlight lamp to make it visible in the dark. This lamp can be adjusted for brightness or turned Off.

To Adjust The Backlight Level:

1. Enter the Settings menu and scroll to LAMP ADJ with the Up/Down soft keys or using the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current backlight setting — HIGH, MEDIUM, LOW or OFF.
3. Use the Up/Down buttons or Right/Left soft keys to switch to the setting you want.
4. Press the ENTR soft key to select the backlight setting. Or press the EXIT soft key to EXIT without making changes to the backlight setting.
5. The radio will return to the Settings menu. The radio will remember the saved backlight setting, when powering off the radio, or disconnecting power to the radio.

NOTE

If the backlight is set to off, ANY key press will activate the backlight at the lowest setting.

LCD Contrast

The LCD backlight will not be visible in daylight, but the LCD Contrast can be adjusted to make it easier to read in different light conditions.

To Change The Contrast:

1. Enter the Settings menu and scroll to CONTRAST ADJUST with the Up/Down soft keys or the UP/Down channel buttons.
2. Press the ENTR soft key and observe the current contrast setting — a number between one 0 and 16.
3. Use the Up/Down buttons or the Right/Left soft keys to change the number up or down
4. Press the ENTR soft key to select a contrast level. Or press the EXIT soft key to EXIT without making changes to the Contrast setting.
5. The radio will return to the Settings menu. The radio will remember the saved contrast level, when powering off the radio, or disconnecting power to the radio.
Operating Your Radio

Set-Up Routines

Confirmation Tone
The **Confirmation Tone** sounds when your CobraMarine VHF radio is turned **On** and to confirm all button presses except for the **Talk** button. If you would prefer not to hear the **Confirmation Tone**, you can turn it **Off** and **On** as you choose.

**To Turn The Confirmation Tone On Or Off:**
1. Enter the **Settings** menu and scroll to **KEY TONE** with the **Up/Down** soft keys or the **Up/Down channel** buttons.
2. Press the **ENTR** soft key and observe the current confirmation tone setting — **ON** or **OFF**.
3. Use the **Up/Down** soft keys or the **Up/Down channel** buttons to switch to the setting you want.
4. Press the **ENTR** soft key to select the setting. Or press the **EXIT** soft key to **EXIT** without making changes to the Key Tone setting.
5. The radio will return to the settings menu. The radio will remember the saved Key Tone setting, when powering off the radio, or disconnecting power to the radio.

U.S.A./International/Canada Channel Maps
Three (3) sets of VHF **Channel Maps** have been established for marine use in the U.S.A., Canada, and the rest of the world (International). Most of the channels are the same for all three (3) maps, but there are definite differences (see table on pages 66 through 78). Your radio has all three (3) maps built into it and will operate correctly in whichever area you choose.

**To Set Your Radio For The Area In Which You Will Be Using It:**
1. Enter the **Settings** menu and scroll to **CHANNEL MODE** with the **Up/Down** soft keys or the **Up/Down channel** buttons.
2. Press the **ENTR** soft key and observe the current channel mode setting — **USA**, **INTERNATIONAL**, or **CANADA**.
3. Use the **Up/Down** soft keys or the **Up/Down channel** buttons to switch to the setting you want.
4. Press the **ENTR** soft key to select the setting. Or press the **EXIT** soft key to **EXIT** without making changes to the Channel Mode setting.
5. The radio will return to the settings menu. The radio will remember the saved Key Tone setting, when powering off the radio, or disconnecting power to the radio.

Time Adjust
All VHF, DSC, and GPS activities use a 24-hour clock and Universal Coordinated Time (UTC) which was formerly known as Greenwich Mean Time (GMT). Time Adjust uses your built-in GPS to gather time input. **Time Adjust** will allow the radio to display the time as Local time or UTC time. For time input to be converted to local time, you need to enter the hour offset of your local time zone from Greenwich. (See world city time zone chart on page 80). You can also choose to have the time displayed in a 12 or 24 hour format.

**To Change The Time Offset:**
1. Enter the **Settings** menu and scroll to **TIME ADJUST** with the **Up/Down** soft keys or the **Up/Down channel** buttons.
2. Highlight the **TIME OFFSET** option in the menu.
3. Press the **ENTR** key and observe the current setting.
4. Use the **Up/Down** soft keys or the **Up/Down channel** buttons to change the setting for your local time zone.
5. Press the **ENTR** soft key to select the setting. Or press the **EXIT** soft key to **EXIT** without making changes to the Local Time Zone setting.
6. The radio will return to the Time Adjust menu. The radio will remember the saved Local Time Zone setting, when powering off the radio, or disconnecting power to the radio.

**To Select UTC or Local Time Display:**
1. Enter the **Settings** menu and scroll to **TIME ADJUST** with the **Up/Down** soft keys or the **Up/Down channel** buttons.
2. Highlight the **LOCAL TIME** option in the menu.
3. Press the **ENTR** key and observe the current setting.
4. Use the **Up/Down** soft keys or the **Up/Down channel** buttons to change the setting for how the radio will display the time (UTC or Local).
5. Press the **ENTR** soft key to select the setting. Or press the **EXIT** soft key to **EXIT** without making changes to the Local Time setting.
6. The radio will return to the Time Adjust menu. The radio will remember the saved Local Time Zone setting, when powering off the radio, or disconnecting power to the radio.
Set-Up Routines

To Select 12 or 24 Hour Format Time Display:
1. Enter the Settings menu and scroll to TIME_ADJUST with the Up/Down soft keys or the Up/Down channel buttons.
2. Highlight the 12H/24H TIME DISP option in the menu.
3. Press the ENTR key and observe the current setting.
4. Use the Up/Down soft keys or the UP/Down channel buttons to change the setting for how the radio will display the time (12 Hour or 24 Hour format).
5. Press the ENTR soft key to select the setting. Or press the EXIT soft key to EXIT without making changes to the time format display setting.
6. The radio will return to the Time Adjust menu. The radio will remember the saved 12 or 24 hour radio display setting, when powering off the radio, or disconnecting power to the radio.

Priority Channel

This setting will allow you to choose whether channel 16 is or is not included when channel scanning.

To Turn The Priority Channel On Or Off:
1. Enter the Settings menu and scroll to PRIORITY setting — ON or OFF.
2. Press the ENTR soft key and observe the current priority channel setting — ON or OFF.
3. Use the Up/Down soft keys or the Up/Down channel buttons to switch to the setting you want.
4. Press the ENTR soft key to select the setting. Or press the EXIT soft key to EXIT without making changes to the priority channel setting.
5. The radio will return to the settings menu. The radio will remember the saved priority channel setting, when powering off the radio, or disconnecting power to the radio.

Weather Alert

This setting will allow you to choose whether activate the Weather Alert feature. When NOAA broadcasts a Weather Alert Signal and your radio is in the Weather Alert mode, you will hear a continuous audible tone and the radio will automatically switch to Weather Radio mode. The alert indicators will sound regardless of what channel you are operating on as soon as a NOAA alert signal is received.

To Turn Weather Alert On Or Off:
1. Enter the Settings menu and scroll to WEATHER ALERT with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current Weather Alert setting — ON or OFF.
3. Use the Up/Down soft keys or the Up/Down channel buttons to switch to the setting you want.
4. Press the ENTR soft key to select the setting. Or press the EXIT soft key to EXIT without making changes to the Weather Alert setting. The radio will turn on the Weather Icon and Weather Alert Icon to indicate that the Weather Alert is active.
5. The radio will return to the settings menu. The radio will remember the saved Weather Alert setting, when powering off the radio, or disconnecting power to the radio.
GPS Menu

All VHF Marine radios SHOULD / NEED to have a GPS receiver connected and operating to effectively use the DSC (Digital Selective Calling) features built-in to the radios. In an Emergency you want the rescue authorities and surrounding vessels to know where you are and to be able to quickly assist you in your time of need. This menu allows you to select the coordinate system which is basically the accuracy (the most accurate setting is selected by default), and allows you to test the GPS receiver, select the coordinate system which is basically the accuracy (the most accurate setting is already selected by default), Select the Satellite Based Augmentation System to be enabled or turned off (some areas on Earth need this turned off for greater accuracy)(defaulted On), and allows you to test the GPS receiver (will test either the internal or an external GPS receiver) to be sure that you are receiving good satellite information and check the GPS signal strength.

To Select the Coordinate System:
1. Enter the Settings menu and scroll to GPS MENU with the Up/Down soft keys or the Up/Down channel buttons.
2. Highlight the COORDINATE SYSTEM option in the menu.
3. Press the ENTR key and observe the current setting.
4. Use the Up/Down soft keys or the UP/Down channel buttons to change the setting to use the desired coordinate system.
5. Press the ENTR soft key to select the setting. Or press the EXIT soft key to EXIT without making changes to the Coordinate System setting.
6. The radio will return to the GPS menu. The radio will remember the saved Coordinate System setting, when powering off the radio, or disconnecting power to the radio.
To Select the GPS Status Screen:
1. Enter the Settings menu and scroll to GPS MENU with the Up/Down soft keys or the Up/Down channel buttons.
2. Highlight the GPS STATUS option in the menu.
3. Press the ENTR key and observe the current setting.
4. The GPS Status screen reports the following information:
   a. How many satellites are currently being tracked.
   b. The overall health of the GPS satellite signals being received.
5. Press the EXIT soft key to EXIT the GPS Status screen.
6. The radio will return to the GPS menu.

NOTE
The larger the signal SNR number the better the GPS signal strength.

To Select the Radio Self Test Screen:
1. Enter the Settings menu and scroll to SELF TEST with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current setting.
3. Press and release the Transmit button on the Microphone to start the test.
4. The Self Test screen reports the following information:
   a. Battery input voltage. Shown as a PASS or FAIL. If a FAIL is reported, then this will show either HIGH (battery voltage is too high) or LOW (battery voltage is too low).
   b. Radio Transmitter Power. Shown as a PASS or FAIL. If a FAIL is reported, the RF output power is incorrect. Check the installation of the radio to ensure proper solid connections to power and the antenna.
   c. Antenna status. Shown as a PASS or FAIL. If a FAIL is reported, the antenna impedance is incorrect, open or shorted.
5. Press the EXIT soft key to EXIT the Self Test screen.
   The radio will return to the menu.
Digital Select Calling (DSC) Setup

DSC Set-Up
Digital selective calling — DSC — employs digital RF signals which tend to carry further and be less susceptible to distortion from noise and atmospheric conditions than analog ones. The result is greater range and more reliable message delivery per watt of output power.

But, that is not the only advantage of DSC equipped radios. Those radios are set up to interface with GPS and to automate many of the operations involved in sending and receiving messages. That results in more compact and accurate messages and less congestion of the airwaves.

The price of these benefits to the user is the time it takes to do the required set-up to make the DSC features work. A little time spent when your radio is new will pay dividends over its life.

These procedures use the Settings menu. Refer to page 28 for information on entering and exiting the Settings menu.

User MMSI Number
The nine (9) digit MMSI number, similar to a telephone number, is a unique identifier for a vessel. DSC incorporates this number into every message that is Sent (Tx) or Received (Rx). Enter the MMSI number as soon as you receive your MMSI number from the issuing agency listed on page 9.

**NOTE**
The radio does not operate in the DSC mode until an official MMSI number is entered. An error tone will sound when attempting to operate in the DSC mode without an MMSI number.

**NOTE**
An MMSI number can only be entered one time. To enter a new MMSI number, please contact Cobra customer service.

To Enter Your MMSI Number:

1. Enter the Settings menu and scroll to DSC SETUP with the Up/Down soft keys or the channel Up/Down buttons.
2. Press the ENTR soft key and scroll to RADIO MMSI ENTRY with the Up/Down soft keys or the channel Up/Down buttons.
3. Press the ENTR soft key. The blinking cursor will appear at the first digit under RADIO MMSI ENTRY.
4. Use the Up/Down soft keys or the channel Up/Down buttons to scroll through the number list to the first digit of your number.
5. Press the ENTR soft key to select the digit and the blinking cursor will move to the next digit of the number.
6. Repeat steps 3 and 4 until all nine (9) digits of your MMSI number are entered.
7. Check that you have entered the number correctly. The radio will ask you to re-enter your number to confirm.
8. Press ENTR soft key to save the MMSI number and the radio will return to the DSC SETUP MENU.

**NOTE**
After the MMSI number has been entered, the RADIO MMSI ENTRY menu option will move to the bottom of the DSC SETUP MENU. This is done because the MMSI entry is entered only once.

If You Incorrectly Enter Your MMSI Number

YOU CAN DO THIS ONLY ONCE! An attempt to enter an MMSI number again will result in an error message as shown.

Pressing the EXIT soft key from the error message will return the radio to the DSC SETUP MENU.

Once the error message appears, the radio will still operate in all non-DSC modes. But you will have to contact Cobra® Electronics (see product service on page 84 for details) for reset before you can enter a new MMSI number into the radio.

Because the MMSI number is so important to DSC operation, this limitation is imposed on all DSC capable radios to prevent constant changes and the potential introduction of errors in the process.
Operating Your Radio

Digital Select Calling (DSC) Setup

If You Transfer Your Radio To A Different Vessel
Contact the MMSI issuing agency from which you obtained your number and change the information associated with your number to correspond to vessel in which it will be mounted.

To View Your MMSI Number At Any Time:
1. Enter the DSC SETUP MENU and scroll to RADIO MMSI ENTRY with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR button and the already entered number will be displayed.
3. Press the EXIT soft key to return to the DSC SETUP MENU.

Individual Directory
DSC calling allows you to call another vessel or station directly if you know its MMSI number. Your CobraMarine VHF radio allows you to store up to twenty (20) names and their associated MMSI numbers for quick access.

To Enter Or Edit Names And MMSI Numbers In The Directory:
1. Enter the DSC SETUP MENU and scroll to INDIVID DIRECTORY (individual directory) with the Up/Down soft keys or the Up/Down channel buttons.
2. The ADD option in the menu will be highlighted the first time this menu is entered. Press the ENTR soft key to ADD a new Name and MMSI number.
3. The cursor will begin to blink at the first character under ADD NAME.
4. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the character list.
5. Press the ENTR soft key to select a character. This will also move the blinking cursor to the next character under ADD NAME.
6. Repeat steps 5 and 6 to enter additional characters — up to a maximum of eleven (11) — for the name.
7. After entering the name, press the ENTR soft key to move the blinking cursor to the first character under MMSI.
8. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the number list.
9. Press the ENTR soft key to select the number and move the cursor to the next character under MMSI.
10. Repeat steps 9 and 10 until the ninth (9) digit MMSI is entered.
11. Press the ENTR button to save the entry.

Group MMSI Number
Nautical organizations such as yacht clubs and the organizers of events such as regattas can establish Group MMSIs. These allow a message to be sent automatically to all members of the group without having to call each one individually.

Each member of the group must enter the group MMSI number in his radio in order to receive group messages.

To Enter A Group MMSI Number:
1. Enter the DSC SETUP MENU and scroll to GROUP MMSI DIR (group MMSI) with the Up/Down soft keys or the Up/Down channel buttons.
2. The ADD option in the menu will be highlighted the first time this menu is entered. Press the ENTR soft key to ADD a new Name and MMSI number.
3. The cursor will begin to blink at the first character under ADD NAME.
4. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the character list.
5. Press the ENTR soft key to select a character. This will also move the blinking cursor to the next character under ADD NAME.
6. Repeat steps 5 and 6 to enter additional characters — up to a maximum of eleven (11) — for the name.
7. After entering the name, press the ENTR soft key to move the blinking cursor to the second character under MMSI (the first digit of a Group MMSI number always starts with a 0).
8. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the number list.
9. Press the ENTR soft key to select the number and move the cursor to the next character under MMSI.
10. Repeat steps 9 and 10 until the ninth (9) digit MMSI is entered.
11. Press the ENTR button to save the entry.
12. Highlight ADD to enter the next new name/MMSI number entry, or highlight the entry just entered and press the ENTR soft key to edit or delete the current entry, or press the EXIT soft key to return to the DSC SETUP MENU.

NOTE
The group MMSI is established by modifying the MMSI assigned to one (1) of the group members. The last digit of that member’s MMSI number is dropped and a zero (0) is inserted at the beginning. For example, member MMSI number 366123456 becomes group MMSI number 036612345.

Group MMSIs can be entered and changed any number of times without encountering the need to have your radio reset.
Operating Your Radio

Position Request Reply Type

The ability to send your position to another station is an added feature of DSC radios that have GPS attached. It is handy for rendezvous and rescue situations. Your CobraMarine VHF radio allows you to choose whether to have the radio automatically respond to all Position Requests it receives or to alert you to a Position Request and allow you to choose whether to respond or not — manual reply.

To Set The Position Request Reply Type:

1. Enter the DSC SETUP MENU menu and scroll to POSITION REQUEST with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current highlighted setting — AUTO or MANUAL.
3. Use the Up/Down soft keys or the Up/Down channel buttons to change the setting.
4. Press the ENTR soft key to select the setting and return to the DSC SETUP MENU.

Auto Channel Switch

The ability of your radio to automatically switch to the requested channel when receiving an Individual Call. In some cases, automatically switching channels may not be wanted, especially if the radio is being used for Bridge to Bridge communications in a busy port or waterway. Your CobraMarine VHF radio allows you to choose whether to have the radio automatically change channels to the requested channel in an Individual Call or not.

To Set The Automatic Channel Switch On or Off:

1. Enter the DSC SETUP MENU menu and scroll to AUTO CHANNEL SWITCH (Automatic Channel Switch) with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current highlighted setting — ON or OFF.
3. Use the Up/Down soft keys or the Up/Down channel buttons to change the setting.
4. Press the ENTR soft key to select the setting and return to the DSC SETUP MENU.

Individual Call Reply

The Individual Call Reply feature is used when receiving Individual DSC calls. When receiving a Individual DSC Call, you may not want the radio to reply to the call automatically. This feature allows you to disable the automatic reply. The ability to send your position to another station is an added feature of DSC radios that have GPS attached. It is handy for rendezvous and rescue situations.

To Set The Individual Reply Auto or Manual:

1. Enter the DSC SETUP MENU menu and scroll to INDIVID CALL REPLY (Individual Call Reply) with the Up/Down soft keys or the Up/Down channel buttons.
2. Press the ENTR soft key and observe the current highlighted setting — AUTO or MANUAL.
3. Use the Up/Down soft keys or the Up/Down channel buttons to change the setting.
4. Press the ENTR soft key to select the setting and return to the DSC SETUP MENU.

Manual Entry

The Manual position entry feature allow you to enter the time (UTC time), Latitude and Longitude.

To Enter The Time, Latitude, and Longitude:

1. Enter the DSC SETUP MENU menu and scroll to MANUAL ENTRY with the Up/Down soft keys or the Up/Down channel buttons.
2. The cursor will begin to blink at the first number of the UTC time entry.
3. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the number list.
4. Press the ENTR soft key to select a number. This will also move the blinking cursor to the next number under UTC Time.
5. Repeat steps 5 and 6 to enter additional numbers.
6. After entering the UTC time, press the ENTR soft key to move the blinking cursor to the first number under LAT (Latitude).
7. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the number list.
8. Press the ENTR soft key to select the first number and move the cursor to the next number under LAT.
9. Repeat steps 9 and 10 until the seventh (7) digit of the LAT is entered.
10. After entering the LAT (Latitude), press the ENTR soft key to move the blinking cursor to the first number under LON (Longitude).
11. Use the Up/Down soft keys or the Up/Down channel buttons to scroll through the number list.
12. Press the ENTR soft key to select the first number and move the cursor to the next number under LON.
13. Repeat steps 9 and 10 until the eighth (8) digit of the LON is entered.
14. Press the ENTR button to save the entry and the radio will return to the DSC SETUP MENU.

MENU EXIT: You can exit the menu at any time by pressing the EXIT soft key on any screen. This method will exit to the next highest menu, repeated presses of the EXIT soft key will return the radio to the radio standby mode. The menu EXIT selection in the menu screen will return the radio immediately to the radio standby mode. When in the menu, just scroll down until the EXIT option is highlighted, then press the ENTR soft key.
Operating Your Radio

Advanced Operation

Cobra® has incorporated several features in your CobraMarine VHF radio to give you quick access to the voice calling channels and to let you monitor more than one (1) channel at once.

Weather Alert Signal
When NOAA broadcasts a Weather Alert Signal and your radio is in the Weather Alert mode, you will hear a continuous audible tone and the radio will automatically switch to Weather Radio mode. The alert indicators will sound regardless of what channel you are operating on as soon as a NOAA alert signal is received.

When You Hear The Alert:
1. Press any key to turn Off the alert alarm and LCD indicator.

Channel 16+
This function gives you quick access to calling Channel 16 or Channel 9 from any operational mode.

To Switch To Channel 16 Or Channel 9:
1. Press the Channel 16+ button to change to Channel 16 from any channel.
2. Press the Channel 16+ button again to change to Channel 9. Additional presses of the Channel 16+ button will toggle back to the original channel and between channels 16 and 9.

Tri-Watch
Tri-Watch gives you one (1) soft key access to scan the three (3) channels of most importance to you. Channel 16 and Channel 9 will always be included as scanned channels. The remaining channel will be the VHF channel in effect when you enter Tri-Watch mode.

NOTE
The radio must be squelched for tri-watch to function. See page 26 for squelch procedure.

To Enter Tri-Watch Mode:
1. In Standby mode, use the Up/Down buttons to go to the channel you want to add as the third location to be scanned.
2. Press the Tri-Watch soft key.

Tri-watch will be indicated on the LCD and the radio will scan between Channel 16, Channel 9, and the third tri-watch channel you selected. A signal on any one (1) of the three (3) channels will stop the scan to allow you to listen to the traffic on the channel. The channel number will be displayed on the LCD.

To Exit Tri-Watch Mode:
1. Press the Tri-Watch soft key. The radio will return to Standby mode.

During Tri-Watch (while receiving an incoming transmission), You Can Choose From The Following:
a. Press the Talk button to remain on that tri-watch channel and return to Standby mode.
If you do not press any buttons, your radio will automatically resume scanning tri-watch channels when the incoming transmission is complete.

During Tri-Watch (while not receiving a transmission):
a. Press the Talk button to communicate on the last tri-watch channel scanned and return to Standby mode.
记忆频道

你可以编程（或标记）任何或所有频道进行扫描。在Memory Scan模式下，你可以扫描标记的频道。

**To Program Memory Channels:**

1. 从Standby模式中选择要标记的频道，并使用Up/Down按钮。
2. 按下MORE软键（如果没有必要），然后按MEM软键。该频道将被标记用于扫描，MEM（内存频道）将在显示扫描当前频道时显示。
3. 重复步骤1至2来添加其他内存频道。

**To Clear Memory Channels:**

1. 从Standby模式中选择要清除其标记的频道，并使用Up/Down按钮。
2. 按下并按住MORE软键（如果没有必要），然后按MEM软键。该频道将被清除标记，MEM（内存频道）将不再在显示扫描当前频道时显示。
3. 重复步骤1至2来清除其他内存频道。

**Memory Scan**

在Memory Scan模式下，无线电将快速从标记的频道切换到标记的频道。任何时候检测到任何活动时，无线电将在收到后2秒钟的无活动继续扫描，除非你切换出Memory Scan模式。

**NOTE**

如果内存频道的数量少于两个（2），Memory Scan模式将不可用。[参见第47页下的内存频道来标记至少两个（2）频道。]

**NOTE**

无线电必须静音才能进行Memory Scan模式。参见第26页上的静音程序。

**To Enter Memory Scan:**

1. 从Standby模式中按下MORE软键（如果没有必要），然后按SCAN软键。

**To Exit Memory Scan:**

1. 从Memory Scan模式中按下SCAN软键。

**During Memory Scan (while receiving an incoming transmission), You Can Choose From The Following:**

a. 按下Talk按钮以保持在内存位置，并结束扫描。这将使无线电返回到Standby模式。

**During Memory Scan (while not receiving a transmission):**

b. 按下Talk按钮以通信在最后扫描的频道，并返回到Standby模式。
Public Address

Use the Public Address (PA) mode of voice transmission to communicate to other nearby vessels or people. This feature requires a mounted and connected optional PA speaker.

To Broadcast on the PA Speaker:
1. Press the PA soft key.
2. Press the Talk button on the microphone and speak into the microphone.

NOTE
While in the PA mode:
- When the Talk button is pressed, the output is directed to the PA speaker and not transmitted as a radio signal through the antenna.
- Received radio messages will not be heard while the PA mode is active.
3. To turn off PA, press PA soft key again.

Burp Feature

Cobra’s Burp feature allows the operator to expel water from inside the speaker grill. This is especially useful if the radio is Sprayed or during extreme foul weather conditions. In these conditions, water can become trapped in the speaker grill and muffle the audio.

To Activate Burp:
1. Press the BURP soft key.
2. The Burp tone(s) at maximum level will sound from the internal speaker for five seconds.
3. During this time, the matrix will display EXCUSE ME !.
4. After a 5-second interval, the radio will return to standby.

Rewind-Say-Again® Feature

The radio has a Cobra exclusive playback feature, Rewind-Say-Again®. This feature allows you to replay the last 20 seconds of an incoming audio transmission. It also allows you to record call details including position coordinates, call signs, registration numbers and store details that will help authorities locate a distressed vessel.

Example 1:
When engine noise, music or conversation creates too much noise to hear an inbound message clearly, press the Rewind-Say-Again® button to enter the Rewind-Say-Again® menu to be able to hear the message a second time. This feature eliminates asking the sender to repeat the message.

Example 2:
When listening to an urgent distress of an excited caller with confusing background noise, press the Rewind-Say-Again® button to enter the Rewind-Say-Again® menu to be able to hear the message a second time and get lifesaving information.

Operation of Rewind-Say-Again®:

1. Press the Rewind button after the last inbound audio transmission.
2. Using the Up/Down soft keys or the channel Up/Down buttons scroll to the PLAY RECORDING menu option.
3. Press the ENTR key to hear the recording.
4. The radio automatically replays the last 20 seconds of the previous audio transmission.
5. Respond to the caller normally, after the message is replayed.

Setup and Advanced Operation of Rewind-Say-Again®:

1. Press the Rewind button.
   a. OFF: EXIT REWIND - When highlighted and the ENTR key is pressed, exits the Rewind features and when the Rewind button is pressed again, the screen above will be displayed.
   b. PAUSE RECORDING - Pause recording of incoming audio transmissions.
   c. PLAYBACK RECORDING - Playback recorded incoming audio.
   d. SAVE RECORDING - Saves recorded incoming audio.
   e. ERASE RECORDING - Erases the saved recording.
   f. RECORD MESSAGE - Record a message (using the microphone to record the message, using the PTT key to start and stop the recording).
   g. PLAYBACK MESSAGE - Playback the recorded message.
   h. SAVE MESSAGE - Save the recorded message.
   i. ERASE MESSAGE - Erases the saved message.
   j. TRANSMIT MESSAGE - Transmit the recorded message.
Operating Your Radio

Digital Select Calling (DSC) Operation

The Send menu displays when the Distress button is pressed.

NOTE
This radio follows Class-D DSC protocol with a dedicated Channel 70 receiver.

Sending Distress Calls
Sending and receiving distress calls and acknowledgements on Channel 70 can be a lifesaver for mariners.

NOTE
The DSC call:

- Sound the distress alarm at all receiving stations.
- Inform receiving stations of your identity (MMSI).
- Informs receiving stations of the nature of the emergency.
- Informs receiving stations of sending position when a GPS device is connected or a position is manually entered. DSC operation does not provide receiving stations with information like number of persons aboard or injuries. This specific information must be communicated by voice on Channel 16 to the station that acknowledges a DSC Distress call.

To Send a DSC Distress Call:

1. From Standby mode, pull down the spring-loaded red door on the transceiver and press the Distress button. You will have three (3) choices:
   - Send a distress call automatically, with your position, if you are connected to a GPS. Or send the call, without your position, if not connected to a GPS.
   - Include a Nature of Distress message with the distress call.
   - Cancel the distress call process and return to Standby mode.

2. Choose one of the following:

   Send an Automatic Distress Call:
   - Press and hold the Distress button.

   Include a Nature of Distress Message with Distress Call:
   - Press and release the Distress button.
   - Press the Up/Down soft keys or the Channel Up/Down buttons to manually select from the list of pre-programmed Nature of Distress calls — UNDESIGNATED, FIRE, FLOODING, COLLISION, GROUNDING, more.
   - Press and hold the Distress button for three (3) seconds to transmit the distress signal.

Abort The Distress Call Process:
If the Distress button is pressed by mistake:

- Press the EXIT soft key to return to Standby mode.

The Distress alarm sounds to confirm that the message is transmitted. At the end of the transmission, the radio maintains a watch on Channel 16 and Channel 70 for an acknowledgement. Press any button to turn Off the alarm.

- If an acknowledgement is received, the Distress alarm sounds again and the responding party's MMSI number displays on the LCD.

- If no acknowledgement is received, the radio resends the message at approximately four (4) minute intervals until an acknowledgement is received or the Distress call is aborted.

Cancelling a Distress Call
At anytime Before receiving a Distress Call Acknowledgement, the Distress can be canceled.

1. From the WAIT FOR ACK screen, press the CANC soft key.

2. From the DISTRESS CANCEL screen, confirm cancelling the Distress Call by pressing the YES soft key.

3. After the Distress Call Cancel message has been sent, press the CONT key.

4. After the Distress Cancel has been sent, your are required to follow-up with a VOICE CANCEL containing the following information:

   “ALL STATIONS” SAY 3 TIMES
   “This is (SHIP NAME), (CALL SIGN), (SHIP MMSI #), (POSITION)” CANCEL MY DISTRESS ALERT OF “(DATE, UTC TIME)”

5. After completing the VOICE CANCEL procedure, press the DONE soft key to return to the radio idle screen.
Receiving Distress Calls

When a vessel is within range of a DSC Distress call, the radio receives the call, sounds the Distress alarm, and switches to Channel 16. All DSC calls that are received will sound one (1) alert alarm. See pages 10-13 for descriptions of the different alarms. Press any button to turn Off the alarm. The received call information continues to display on the LCD.

When A Distress Call Is Received:
1. Press any button to turn Off the alarm.
2. Read and write down the distress information that displays on the LCD (position data may or may not be shown); then determine whether to answer the call.
3. Respond, if appropriate, by pressing and holding the Talk button to transmit on Channel 16.
4. The received information is placed into the Call Log. See page 62 for more information on viewing the Call Waiting Log.
5. If MMSI (Maritime Mobile Service Identify) matches a contact from the Individual Directory entry stored in your radio, the name identification displays and the alarm sounds to identify the Name of the matching MMSI member.
6. Press ESC after viewing the display to return to normal Standby mode.

NOTE
The radio automatically switches to Channel 16 upon receiving a DSC Distress call and the alarm will sound for approximately two (2) minutes. Press any button to clear the Distress alarm instantly.

Regarding Distress Relay Calls

This radio cannot send Distress Relay calls. Only large ships and shore stations, with specially equipped radios, can send Distress Relay calls.

Receiving Distress Relay Calls

This radio does respond to a Distress Relay call just as it responds to a Distress call.

Sending An All Ships Calls

Use the DSC All Ships call for the same urgency and safety purposes as the Pan and Securite voice calls as well as sending Routine messages to all stations at once. The DSC All Ships call reaches all stations in radio range. Use the DSC All Ships call for urgent, but not life-threatening situations or to broadcast a safety warning to all vessels in the area.

To Send An All Ships Call:
1. Press the CALL soft key and scroll to ALL SHIPS CALL with the UP/Down soft keys or the channel Up/Down buttons.
2. Select either SAFETY or URGENCY and press the ENTR soft key.
3. Using the Up/Down soft keys or the channel Up/Down buttons, select the voice channel all radios will tune to after the All Ships message is sent and press the ENTR key.
4. Press the ENTR soft key to send the All Ships Call.
5. The radio will tune to the voice channel previously selected.
6. Press the EXIT soft key to exit the All Ships Call mode and return the radio to the idle screen.
Advanced Operation

Receiving An All Ships Call
All Ships calls received from stations within range of the radio sound the Distress alarm and switch the radio to Channel 16.

When An All Ships Call Is Heard:
1. Press any button to turn Off the alarm.
2. Read and write down the MMSI of the vessel sending the call as well as the date and time of the call.
3. Listen to the incoming voice message on the channel the radio selects for the incoming All Ships call.

Sending A Geographical Call
This radio does not send Geographical calls. Only large ships and shore stations with specially equipped radios send Geographical calls.

Sending An Individual Call
Use the DSC Individual call feature to request communication with one (1) exclusive station. The DSC Individual call does not alert all other stations within range.

To Send An Individual Call:
1. Press the CALL soft key and scroll to INDIVIDUAL CALL with the UP/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a previously entered directory entry or use the MANUAL entry option.
3. Press the ENTR key.
4. Using the Up/Down soft keys or the channel Up/Down buttons, select the voice channel all radios will tune to after the Individual Call message is sent and press the ENTR key.
5. Press the ENTR soft key to send the Individual Call.
6. The radio will tune to the voice channel previously selected.
7. Press the EXIT soft key to exit the Individual Call mode and return the radio to the idle screen.

If the radio called sends back an automatic DSC response “able to comply,” the individual alarm will sound. Wait for a voice message from the called station.

If an “unable to comply” response or no reply is received, the radio display asks to resend the message or exit the menu. At the Unavailable menu, Press REPT or EXIT soft keys.

If REPT is selected, the radio restarts the individual call.

If EXIT is selected, the radio will return to the Call Menu.
Receiving An Individual Call

When another station makes an Individual call to your radio:
- The Individual alarm sounds.
- The caller is identified on the LCD.
- If Automatic Channel Switch is on, the radio switches to the channel selected by the caller.
- Call information is placed in the Call Log.

To Receive An Individual Call:
Press the Talk button and greet the caller.

Sending A Group Call

Sending a Group call is like sending an Individual call, but the group MMSI information is used and the resend and DSC responses do not apply. See pg. 41 for creating and entering a group MMSI.

To Send A Group Call:
1. Press the CALL soft key and scroll to GROUP CALL with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a previously entered directory entry or use the MANUAL entry option.
3. Press the ENTR key.
4. Using the Up/Down soft keys or the channel Up/Down buttons, select the voice channel all radios will tune to after the Group Call message is sent and press the ENTR key.
5. Press the ENTR soft key to send the Group Call.
6. The radio will tune to the voice channel previously selected.
7. Press the EXIT soft key to exit the Group Call mode and return the radio to the idle screen.

- All radios switch to the channel selected in step 1. Press and hold the Talk button to send a voice message to everyone in the group.
- Anyone in the group can transmit on the channel.

Receiving A Group Call

When another station makes a Group call to the radio, the Individual alarm sounds, the caller is identified on the LCD, call information is placed in the Call Log, and the radio is switched to the channel selected by the caller, similar to an Individual call. Press any button to turn Off the alarm.

To Receive A Group Call:
1. Listen for the group voice message.
2. Press the Talk button and respond only if appropriate.

Sending A Position Request

Position Request mode enables a DSC radio to obtain the position (latitude and longitude) of a station that has a GPS device connected to the DSC radio at that station. In most cases, a reply will be forthcoming. If for some reason, your request is not acknowledged in five (5) minutes, the user will be prompted to Resend the request or exit the menu.

To Request The Position Of Another Station:
1. Press the CALL soft key and scroll to POSITION REQUEST with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a previously entered directory entry or use the MANUAL entry option.
3. Press the ENTR key.
4. Press the ENTR soft key to send the Position Request Call.
5. The radio will show the WAITING FOR ACK screen while waiting for the acknowledgement from the called radio. And will show the ACKNOWLEDGED screen after the called radio responds.
Sending A Position Request continued

6. After the called radio acknowledges the call, use the Down soft key to view the called radio’s current position.

7. Press the EXIT soft key to exit the Position Request mode and return the radio to the Call Menu.

NOTE
Your radio will send the Position Request and there will be one (1) of three (3) possible responses:
- You will receive the position.
- You will receive a no position data response, meaning the station you queried is not connected to a GPS device and cannot send its position.
- You will receive a no reply response, meaning the operator of that station has chosen not to reply to your request.

If You Receive A Position:
The requested position with the station name and MMSI will show on your screen.
Press the Enter button to return to Standby mode after you have noted the station’s position.

NOTE
If the radio is connected properly to your chartplotter, you will see the requested position of the other vessel indicated on the display.

Receiving A Position Request
When you went through the DSC set-up process, you set a position request reply type. (See page 42 to change your setting.) Depending on the setting you chose, when a Position Request message is received, your radio will enter either:
- The Auto Reply mode.
- The Manual Reply mode.

When The Radio Is In Auto Reply Mode:
A position request will sound the Position Request alarm and show the name of the requesting station on the LCD. Your radio will automatically respond. It will send your position, if you have a GPS device connected to your radio, or NO POS. DATA (no position data), if you do not have a GPS device connected.
Press any button to silence the alarm and exit the display.

When The Radio Is In The Manual Reply Mode:
A position request message will sound the Position Request alarm and show the name of the requesting station. You can choose to:
- Reply and send your position.
- Exit without sending your position.

If You Choose to Reply with Your Position:
1. Press the ENTR soft key.

If You Choose Not to Reply with Your Position:
2. Press the EXIT soft key.
Sending A Position Send

Position Send uses your connected GPS in similar fashion to the Position Request function, except that you initiate the activity to let another station know where you are.

To Send A Position Send Message:

1. Press the CALL soft key and scroll to POSITION SEND with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a previously entered directory entry or use the MANUAL entry option.
3. Press the ENTR key.
4. Press the ENTR soft key to send the Position SEND Call.
5. Press the EXIT soft key to exit the Position Send mode and return the radio to the Call Menu.

Receiving A Position Send

When another station sends you its position in Position Send mode, the Individual Alarm will sound and the station’s name and position will be shown on the LCD. Press any button to turn Off the alarm and return to Standby mode.
Advanced Operation

Call Log and Distress Log

Call Waiting functions similarly to the Caller ID function on your telephone. It will capture the caller’s MMSI identification number and any other data included in a DSC message.

NOTE
Each Call Log memory can hold up to 20 messages. Once the memory becomes full, each new call will erase the oldest call information on a first-in, first-out basis.

NOTE
The Envelope icon will be displayed when calls are received and placed into any of the call logs.

- The envelope icon will be shown closed to indicate unread messages.
- The envelope icon will be shown open to indicate that all messages have been read.

To Review Call Log Messages Received While In DSC Standby Mode:
1. Press the CALL soft key and scroll to CALL WAITING with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight DISTRESS LOG or RECEIVED CALLS logs.
3. Press the ENTR key.
4. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a log entry.
5. Press the ENTR key to view the log entry.
6. Press the EXIT soft key to exit the Position Send mode and return the radio to the DSC CALL LOGS Menu.

To Delete Call Log Information:
1. Press the CALL soft key and scroll to CALL.Waiting with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight DELETE CALL LOGS.
3. Press the ENTR key.
4. Using the Up/Down soft keys or the channel Up/Down buttons to highlight DISTRESS or RECEIVED CALLS log entry.
5. Press the ENTR key and confirm delete by pressing the ENTR key.
6. Press the EXIT soft key to exit the Position Send mode and return the radio to the DELETE CALL LOGS Menu.

Test Call

The Test Call feature allows the user to confirm that the radio is fully operational and that the DSC call functions are working properly.

1. Press the CALL soft key and scroll to TEST CALL with the Up/Down soft keys or the channel Up/Down buttons and press the ENTR soft key.
2. Using the Up/Down soft keys or the channel Up/Down buttons to highlight a previously entered directory entry or use the MANUAL entry option.
3. Press the ENTR key.
4. Press the ENTR soft key to send the Test Call.
5. The radio will tune to the voice channel previously selected.
6. Press the EXIT soft key to exit the Test Call mode and return the radio to the Call Menu.
Maintenance

Very little maintenance is required to keep your CobraMarine VHF radio in good operating condition.

- Keep the radio clean by wiping with a soft cloth and mild detergent. Rinse with fresh water. Do not use solvents or harsh or abrasive cleaners, which could damage the case or scratch the LCD screen.
- If the radio is exposed to salt water, rinse it in fresh water at least once a day to prevent build-up of salt deposits, which could interfere with button operation.

Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause(s)</th>
<th>Solution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No display on LCD when radio is turned On</td>
<td>Improper power connection</td>
<td>Insure power connections are proper and secure</td>
</tr>
<tr>
<td>Will transmit at one (1) watt, but not at 25 watts</td>
<td>Selected channel is limited to one (1) watt</td>
<td>Switch to another channel</td>
</tr>
<tr>
<td>Will not transmit</td>
<td>Selected channel is limited to receive only</td>
<td>Switch to another channel</td>
</tr>
<tr>
<td>No sound from speaker</td>
<td>Volume level is too low or squelch level is too deep</td>
<td>Readjust volume and squelch</td>
</tr>
<tr>
<td>No answer to calls</td>
<td>Out of range of other station</td>
<td>Switch to high power (25 watts) or move closer</td>
</tr>
<tr>
<td></td>
<td>Signal is blocked by terrain</td>
<td>Move until you have a “line-of-sight” to the other station</td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Channels</td>
<td>All U.S., Canadian, and International 10 NOAA Weather Channels</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>25 kHz</td>
</tr>
<tr>
<td>Modulation</td>
<td>5 kHz Max.</td>
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<tr>
<td>Input Voltage</td>
<td>13.8 VDC</td>
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<tr>
<td>Current Drain:</td>
<td></td>
</tr>
<tr>
<td>Stand-by</td>
<td>20 mA</td>
</tr>
<tr>
<td>Receive</td>
<td>200 mA</td>
</tr>
<tr>
<td>Transmit</td>
<td>5A @ High power 1A @ Low</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-20˚ C to 60˚ C</td>
</tr>
<tr>
<td>Unit Dimensions</td>
<td>6.25” x 3.0” x 6” (15.9 cm x 5.7 cm x 18 cm)</td>
</tr>
<tr>
<td>Unit Weight</td>
<td>2 lbs., 12.0 oz. (1100 g)</td>
</tr>
<tr>
<td>Receiver</td>
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</tr>
<tr>
<td>Frequency Range</td>
<td>156.050 to 163.275 MHz</td>
</tr>
<tr>
<td>Receiver Type</td>
<td>Double Conversion Super-Heterodyne</td>
</tr>
<tr>
<td>Sensitivity:</td>
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</tr>
<tr>
<td>20 dB Quieting</td>
<td>0.35 uV</td>
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<tr>
<td>12 dB Sinad</td>
<td>0.30 uV</td>
</tr>
<tr>
<td>AF Output</td>
<td>2.5 Watts @ 8 Ohms</td>
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<tr>
<td>Transmitter</td>
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</tr>
<tr>
<td>Frequency Range: TX</td>
<td>156.025 to 157.425 MHz</td>
</tr>
<tr>
<td>RF Output Power</td>
<td>1 and 25 Watts</td>
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<tr>
<td>Spurious Emissions</td>
<td>-60 dB High -55 dB Low</td>
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<td>Microphone Type</td>
<td>Electret</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>+/-10 ppm</td>
</tr>
<tr>
<td>FM Hum and Noise</td>
<td>40 dB</td>
</tr>
</tbody>
</table>
VHF Marine Channel Assignments

Three (3) sets of VHF channels have been established for marine use in the U.S.A., Canada and the rest of the world (International). Most of the channels are the same for all three (3) maps, but there are definite differences (see table on the following pages). Your radio has all three (3) maps built into it and will operate correctly in whichever area you choose.

The following is a brief outline of the channel assignments in the U.S.A. Channel Map.

Distress, Safety, and Calling
Channel 16
Getting the attention of another station (calling) or in emergencies (distress and safety).

Calling
Channel 9
General-purpose (non-emergency) calling by non-commercial vessels. Recreational boaters are urged to use this channel to reduce congestion on Channel 16.

Intership Safety
Channel 6
Ship-to-ship safety messages and for search and rescue messages to Coast Guard ships and aircraft.

Coast Guard Liaison
Channel 22A
To talk to the Coast Guard, Canadian Coast Guard (non-emergency) after making contact on Channel 16.

Non-Commercial
Channels 68*, 69, 71, 72, 78A, 79A*, 80A*
Working channels for small vessels. Messages must be about needs of the vessel, such as fishing reports, berthing and rendezvous. Use Channel 72 only for ship-to-ship messages.

Commercial
Channels 1A, 7A, 8, 9, 10, 11, 18A, 19A, 63A, 67, 72, 79A, 80A, 88A*
Working channels for working ships only. Messages must be about business or needs of the ship. Use Channels 8, 67, 72 and 88A only for ship-to-ship messages.
## VHF Marine Channel Assignments

### Sea Tow Automated Radio Check (ARC)
**Channels 24, 25, 26, 27, 28, 84***
Tune your radio to the proper channel for your area (see seatow.com/arc). Conduct a radio check as you normally would. Upon releasing the mic the system will replay your transmission letting you hear how you sound.

### Port Operations
**Channels 1A*, 5A*, 12*, 14*, 18, 19, 20A, 21, 22, 63A*, 65A, 66A, 73, 74, 75, 76, 77*, 79, 80, 81, 82**
Used for directing the movement of ships in or near ports, locks or waterways. Messages must be about operational handling, movement and safety of ships.

### Navigational
**Channels 13, 67**
Channels are available to all vessels. Messages must be about navigation, including passing or meeting other vessels. These are also the main working channels for most locks and drawbridges. You must keep your messages short and power output at no more than 1 watt.

### Maritime Control
**Channel 17**
For talking to vessels and coast stations operated by state or local governments. Messages must be about regulation and control, boating activities, or assistance.

### Digital Selective Calling
**Channel 70**
This channel is set aside for distress, safety and general calling using only digital selective calling techniques. Voice communication is prohibited; your radio cannot transmit voice messages on this channel.

### Weather
**Channels Wx 1 Thru 10**
Receive-only channels for NOAA and Canadian weather broadcasts. You cannot transmit on these channels.

### Digital Selective Calling (Spanish)
**Canal 70**
Este canal está reservado para solicitudes de auxilio, seguridad y llamadas de carácter general que usen solamente técnicas de llamadas selectivas digitales. Las comunicaciones verbales están prohibidas; el radio no puede transmitir mensajes de voz por este canal.

### Weather (Spanish)
**Canales Wx 1 a 10**
Canales de recepción únicamente para difusión de información meteorológica NOAA y canadiense. Usted no puede transmitir por estos canales.

---

### Sea Tow Control de radio automatizado (ARC)
**Canales 24, 25, 26, 27, 28, 84***
Sintonice su radio en el canal correcto para su área (ver seatow.com/arc). Llevar a cabo una comprobación de la radio como lo haría normalmente. Al soltar el micrófono el sistema se volverá a reproducir la transmisión que le permite escuchar cómo suena.

### Operaciones portuarias
**Canales 1A*, 5A*, 12*, 14*, 18, 19, 20A, 21, 22, 63A*, 65A, 66A, 73, 74, 75, 76, 77*, 79, 80, 81, 82**
Usados para dirigir el movimiento de las embarcaciones dentro de áreas portuarias, esclusas o canales. Los mensajes deberán estar relacionados con maniobras operacionales, movimientos y seguridad de las embarcaciones.

### Navegación
**Canales 13, 67**
Estos canales están disponibles para todas las embarcaciones. Los mensajes deberán estar relacionados con la navegación, incluidas las maniobras para pasar o alcanzar otras embarcaciones. Estos también son los principales canales activos para la mayoría de las esclusas y puentes levadizos. Usted deberá transmitir mensajes cortos y mantener la potencia de salida en un vatio como máximo.

### Control marítimo
**Canal 17**
Para comunicarse con embarcaciones y estaciones costeras operadas por entidades gubernamentales locales o estatales. Los mensajes deberán estar relacionados con regulación y control, asistencia o actividades de navegación.

### Llamadas selectivas digitales
**Canal 70**
Este canal está reservado para solicitudes de auxilio, seguridad y llamadas de carácter general que usen solamente técnicas de llamadas selectivas digitales. Las comunicaciones verbales están prohibidas; el radio no puede transmitir mensajes de voz por este canal.

### Meteorología
**Canales Wx 1 a 10**
Canales de recepción únicamente para difusión de información meteorológica NOAA y canadiense. Usted no puede transmitir por estos canales.

---

### NOTE
- These channels are restricted to the listed uses in certain parts of the country or for certain types of users only. Consult FCC rules or a knowledgeable radio operator before using them.

- El uso de estos canales está dedicado a las aplicaciones que aparecen en la lista, en ciertas partes del país o para ciertos tipos de usuario solamente. Consulte las normas de la FCC o a un operador de radio con experiencia antes de usarlos.
# VHF Marine Channel Assignments

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### Public Correspondence (Marine Operator)

- Correspondencia pública (operador marítimo)
- VTS in selected areas
- Operaciones portuarias y comerciales; VTS en áreas selectas

### Port Operations and Commercial

- Operaciones portuarias y comerciales; VTS en áreas selectas
- Operaciones portuarias; VTS en áreas selectas

### Intership Safety

- Seguridad entre embarcaciones
- Operaciones portuarias; VTS en áreas selectas

### Commercial

- Comerciales
- Comercial (entre embarcaciones solamente)

### Boater Calling Channel

- Canal de llamada de la tripulación, no comercial (recreativo)

### Commercial (Intership Only)

- Comercial (entre embarcaciones solamente)

### Environmental (Receive Only)

- Medioambiental (recepción solamente)
- Usado por radiobalizas de localización de siniestros (EPIRB) clase C

### Canada (EPIRB Buoys Only)

- Canadá (boyas de EPIRB solamente)
- Internacional (comunicación de a bordo)
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### VHF Marine Channel Assignments

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## VHF Marine Channel Assignments

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### Channel Use (English)
- **Sea Tow Automated Radio Check Service**
- **Public Correspondence (Marine Operator)**
- **Port Operations, Ship Movement**

### Channel Use (Spanish)
- **Servicio de radio automatizado del control**
- **Correspondencia pública (operador marítimo)**
- **Operaciones portuarias, movimiento de embarcaciones**

### Safety: Continuous Marine Broadcast (CMB) service by MCTS Canada
- **Public Correspondence (Marine Operator)**
- **Port Operations, Ship Movement**
- **U.S. (Government Only); Canada (Coast Guard Only); West Coast (Coast Guard Only); East Coast (Commercial Fishing)**

### Channel Map
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<th>Channel</th>
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1 watt CAN
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<th>Uso de canales (Español)</th>
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<td>Comercial (en los Grandes Lagos también no comercial)</td>
</tr>
<tr>
<td>Port Operations, Ship Movement</td>
<td>Operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>Commercial (Also Non-Commercial only in Great Lakes)</td>
<td>Comercial (en los Grandes Lagos también no comercial)</td>
</tr>
<tr>
<td>Port Operations, Ship Movement</td>
<td>Operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>U.S. (Government Only); Canada (Coast Guard Only)</td>
<td>EE.UU. (entidades gubernamentales solamente); Canadá (guardia costera solamente)</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator) Port Operation, Ship Movement</td>
<td>Correspondencia pública (operador marítimo) operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>U.S. (Government Only); Canada (Coast Guard Only)</td>
<td>EE.UU. (entidades gubernamentales solamente); Canadá (guardia costera solamente)</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator) Port Operation, Ship Movement</td>
<td>Correspondencia pública (operador marítimo) operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>U.S. (Government Only); Canada (Coast Guard Only)</td>
<td>EE.UU. (entidades gubernamentales solamente); Canadá (guardia costera solamente)</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator) Port Operation, Ship Movement</td>
<td>Correspondencia pública (operador marítimo) operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>U.S. (Government Only); Canada (Coast Guard Only)</td>
<td>EE.UU. (entidades gubernamentales solamente); Canadá (guardia costera solamente)</td>
</tr>
<tr>
<td>Coast Guard Only – Weather Broadcasts</td>
<td>Solamente Guardacostas – Transmisiones Meteorológicas</td>
</tr>
<tr>
<td>Sea Tow Automated Radio Check Service</td>
<td>Sea Tow Servicio de radio automatizado del control</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator) Port Operation, Ship Movement</td>
<td>Correspondencia pública (operador marítimo) operaciones portuarias, movimiento de embarcaciones</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator)</td>
<td>Correspondencia pública (operador marítimo)</td>
</tr>
<tr>
<td>Public Correspondence (Marine Operator)</td>
<td>Correspondencia pública (operador marítimo)</td>
</tr>
<tr>
<td>Public Correspondence (Ship to Coast). In U.S. only within 75 miles of Canadian Border.</td>
<td>Correspondencia pública (entre embarcación y costa). En los EE.UU., solamente dentro de los casi 121 kilómetros (75 millas) de la frontera canadiense</td>
</tr>
<tr>
<td>Commercial Intership only</td>
<td>Comercial entre embarcaciones solamente</td>
</tr>
</tbody>
</table>
Many of the plain-numbered channels, such as 01, 02 and 03, transmit and receive on different frequencies. This is termed duplex operation. The rest of the plain-numbered channels and all of the A channels, such as 01A, 03A and 04A, transmit and receive on a single frequency, which is termed simplex operation. Your radio automatically adjusts to these conditions. When in simplex operation, the A icon will appear on the LCD (see illustration on page A3).

NOTE
All channels are preprogrammed at the factory according to international regulations and those of the FCC (U.S.A.) and Industry Canada (Canada). They cannot be altered by the user nor can modes of operation be changed between simplex and duplex.

### Weather Channel Assignments

<table>
<thead>
<tr>
<th>Channel Number</th>
<th>RX Frequency MHz</th>
<th>Weather Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>162.550</td>
<td>NOAA</td>
</tr>
<tr>
<td>2</td>
<td>162.400</td>
<td>NOAA</td>
</tr>
<tr>
<td>3</td>
<td>162.475</td>
<td>NOAA</td>
</tr>
<tr>
<td>4</td>
<td>162.425</td>
<td>NOAA</td>
</tr>
<tr>
<td>5</td>
<td>162.450</td>
<td>NOAA</td>
</tr>
<tr>
<td>6</td>
<td>162.500</td>
<td>NOAA</td>
</tr>
<tr>
<td>7</td>
<td>162.525</td>
<td>NOAA</td>
</tr>
<tr>
<td>8</td>
<td>161.650</td>
<td>Canada</td>
</tr>
<tr>
<td>9</td>
<td>161.775</td>
<td>Canada</td>
</tr>
<tr>
<td>10</td>
<td>163.275</td>
<td>NOAA</td>
</tr>
</tbody>
</table>

NOTA
Muchos de los canales de números simples, como 01, 02 y 03, transmiten y reciben en diferentes frecuencias. A esto se le llama operación dúplex. El resto de los canales de números simples y todos los canales A, como 01A, 03A y 04A, transmiten y reciben en una sola frecuencia, a la que se le llama operación simple (simplex). Su radio se ajusta automáticamente a estas condiciones. Cuando esté en operación simple, el icono A aparecerá en la pantalla de cristal líquido (vea la ilustración de la página A3).

NOTA
Todos los canales vienen programados previamente de fábrica conforme a los reglamentos internacionales y a los de la FCC (EE. UU) e Industry Canada (Canadá). No pueden ser alterados por el usuario, así como tampoco pueden cambiarse los modos de operación entre simple y dúplex.
World City Time Zones

In order to set correct local time as compared to different World City Time Zones, enter the hour “offset” as listed below. The correct local time appears on the VHF for cities all over the world. See page 43 for setup information.

<table>
<thead>
<tr>
<th>Longitudinal Zone</th>
<th>Offset</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>E172.50 to W172.50</td>
<td>-12</td>
<td>IDLW (International Date Line West)</td>
</tr>
<tr>
<td>W172.50 to W157.50</td>
<td>-11</td>
<td>Nome</td>
</tr>
<tr>
<td>W157.50 to W142.50</td>
<td>-10</td>
<td>Honolulu</td>
</tr>
<tr>
<td>W142.50 to W127.50</td>
<td>-9</td>
<td>Yukon STD</td>
</tr>
<tr>
<td>W127.50 to W112.50</td>
<td>-8</td>
<td>Los Angeles STD</td>
</tr>
<tr>
<td>W112.50 to W097.50</td>
<td>-7</td>
<td>Denver STD</td>
</tr>
<tr>
<td>W097.50 to W082.50</td>
<td>-6</td>
<td>Chicago STD</td>
</tr>
<tr>
<td>W082.50 to W067.50</td>
<td>-5</td>
<td>New York STD</td>
</tr>
<tr>
<td>W067.50 to W052.50</td>
<td>-4</td>
<td>Caracas</td>
</tr>
<tr>
<td>W052.50 to W037.50</td>
<td>-3</td>
<td>Rio de Janeiro</td>
</tr>
<tr>
<td>W037.50 to W022.50</td>
<td>-2</td>
<td>Fernando de Noronha</td>
</tr>
<tr>
<td>W022.50 to W007.50</td>
<td>-1</td>
<td>Azores Islands</td>
</tr>
<tr>
<td>W007.50 to E007.50</td>
<td>+0</td>
<td>London</td>
</tr>
<tr>
<td>E007.50 to E022.50</td>
<td>+1</td>
<td>Rome</td>
</tr>
<tr>
<td>E022.50 to E037.50</td>
<td>+2</td>
<td>Cairo</td>
</tr>
<tr>
<td>E037.50 to E052.50</td>
<td>+3</td>
<td>Moscow</td>
</tr>
<tr>
<td>E052.50 to E067.50</td>
<td>+4</td>
<td>Abu Dhabi</td>
</tr>
<tr>
<td>E067.50 to E082.50</td>
<td>+5</td>
<td>Maldives</td>
</tr>
<tr>
<td>E082.50 to E097.50</td>
<td>+6</td>
<td>Dhuburi</td>
</tr>
<tr>
<td>E097.50 to E112.50</td>
<td>+7</td>
<td>Bangkok</td>
</tr>
<tr>
<td>E112.50 to E127.50</td>
<td>+8</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>E127.50 to E142.50</td>
<td>+9</td>
<td>Tokyo</td>
</tr>
<tr>
<td>E142.50 to E157.50</td>
<td>+10</td>
<td>Sydney</td>
</tr>
<tr>
<td>E157.50 to E172.50</td>
<td>+11</td>
<td>Solomon Islands</td>
</tr>
<tr>
<td>E172.50 to W172.50</td>
<td>+12</td>
<td>Auckland</td>
</tr>
</tbody>
</table>

Limited 3-Year Warranty

For Products Purchased In the U.S.A.

Cobra® Electronics Corporation warrants that its CobraMarine VHF radio, and the component parts thereof, will be free of defects in workmanship and materials for a period of three (3) years from the date of first consumer purchase. This warranty may be enforced by the first consumer purchaser, provided that the product is utilized within the U.S.A.

Cobra® will, without charge, repair or replace, at its option, defective radios, products or component parts upon delivery to the Cobra® Factory Service department, accompanied by proof of the date of first consumer purchase, such as a duplicated copy of a sales receipt.

You must pay any initial shipping charges required to ship the product for warranty service, but the return charges will be at Cobra®’s expense, if the product is repaired or replaced under warranty. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

Exclusions: This limited warranty does not apply:

1. To any product damaged by accident.
2. In the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs.
3. If the serial number has been altered, defaced, or removed.
4. If the owner of the product resides outside the U.S.A.

All implied warranties, including warranties of merchantability and fitness for a particular purpose are limited in duration to the length of this warranty. Cobra® shall not be liable for any incidental, consequential or other damages; including, without limitation, damages resulting from loss of use or cost of installation.

Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

For Products Purchased Outside the U.S.A.

Please contact your local dealer for warranty information.
Product Service

If you have any questions about operation or installing your new CobraMarine VHF product, or if you are missing parts...

Please call Cobra first! DO NOT RETURN THIS PRODUCT TO THE STORE!
See customer assistance on page A1.

If your product should require factory service, please call Cobra first before sending your radio. This will ensure the fastest turn-around time on your repair. You may be asked to send your radio to the Cobra factory. It will be necessary to furnish the following to have the product serviced and returned:

1. For warranty repair include some form of proof-of-purchase, such as a mechanical reproduction or carbon of a sales receipt. If you send the original receipt, it cannot be returned.
2. Send the entire product.
3. Enclose a description of what is happening with the radio. Include a typed or clearly printed name and address of where the radio is to be returned.
4. Pack radio securely to prevent damage in transit. If possible, use the original packing material.
5. Ship prepaid and insured by way of a traceable carrier such as United Parcel Service (UPS) or Priority Mail to avoid loss in transit to: Cobra Factory Service, Cobra Electronics Corporation, 6500 West Cortland Street, Chicago, Illinois 60707 U.S.A.
6. If the radio is in warranty, upon receipt of your radio it will either be repaired or exchanged depending on the model. Please allow approximately three (3) to four (4) weeks before contacting Cobra for status. If the radio is out of warranty, a letter will automatically be sent informing you of the repair charge or replacement charge.

If you have any questions, please call 773-889-3087 for assistance.

Flush Mount Template / Plantilla para montaje empotrado

Use the supplied template to mark and cut an opening in the flat surface.

CAUTION
Before cutting, be sure the area behind the flat surface is clear of any instruments or wires that might be damaged in the process.

Use la plantilla suministrada para marcar y cortar el agujero en la superficie plana.

PRECAUCIÓN
Antes de cortar, compruebe que no haya instrumentos o cables en el área detrás de la superficie plana, que puedan resultar dañados durante el proceso.