VHF 720

Marine Radio

Owner's Manual & Reference Guide

GARMIN®

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About This Manual

Thank you for choosing the GARMIN VHF 720. To get the most from your new VHF marine radio, take time to read through this owner's manual in order to understand all of the operating features. This manual is organized into three sections for your convenience:

The **Introduction** to the "VHF 720 Features" section gives you an overview of the unit's functional features.

The **Getting Started** section gets you started on using the VHF 720 for basic radio uses.

The **Reference** section contains information on items such as accessories, a channel list, a troubleshooting guide, and the index.

Before getting started, check to be certain that your VHF 720 package includes the following items. If you are missing anything, please contact your dealer immediately.

Standard Package:

- VHF 720 Unit
- Lanyard
- Belt Clip
- Owner's Manual
- Antenna (SMA Connector)

Refer to Section 3, Appendix A, for a list of optional accessories available from your GARMIN Dealer.

FCC COMPLIANCE STATEMENT

This device meets requirements for Parts 2, 15, and 80 of the FCC Regulations. It has been tested for compliance with all necessary FCC standards.

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

The VHF 720 does not contain any user-serviceable parts. Repairs should only be made by and authorized service center. Unauthorized repairs or modifications could void your warranty and your authority to operate this device.

IMPORTANT!

GARMIN strongly recommends obtaining a marine radio user's guide such as the "Maritime Radio User's Handbook" published by the RCTM (Radio Technical Commission for Maritime Services), P.O. Box 19087, Washington, D.C. 20036, to ensure proper radio operation and protocol. Improper usage can result in fines levied on mariners by the FCC.

IMPORTANT!

The Telecommunications Act of 1996, effective February 8, 1996, provides the FCC discretion to eliminate radio station license requirements for aircraft and ships. At the present time, you do not need an individual license to operate the VHF 720 aboard your private vessel in many circumstances. To find out the specific details on whether you are exempt from licensing, please refer to the FCC Fact Sheet PR 5000 or contact the FCC at: 1-800-322-1117.

Note that no license is required for a portable radio used only as a backup on a vessel which already has a station license per FCC 506 Instructions, dated 1993.

If a marine license is required or desired, contact the FCC at 1-800-322-1117 to request Form 506, Application for Ship Radio License.

The FCC also has a fax-on-demand service to provide forms by fax at 1-202-418-0177.

The VHF 720 user accepts all responsibility for obtaining the proper licensing before using the transmitter.

WARNING!

This transmitter will operate on frequencies (channels) that have restricted use in the United States. The channel assignments include frequencies assigned for exclusive use of the U.S. Coast Guard, use in Canada, and use in International waters. Operation on these frequencies without proper authorization is strictly forbidden. For frequencies (channels) that are currently for use in the U.S. without an individual license, please contact the FCC Call Center at 1-888-CALL-FCC.

IMPORTANT!

Read all instructions carefully and completely before using the VHF 720 Marine Radio. This device is intended only as an aid to boating safety and navigation. The performance of the VHF 720 can be affected by many factors including environmental conditions and improper handling or use. It is the user's responsibility to exercise good safety and navigational judgement and the GARMIN VHF 720 should not be relied upon in lieu of such prudence and judgement.

CAUTIONS

For these reasons, the operator should exercise the following precautions to ensure proper and reliable use of the GARMIN VHF 720.

DO NOT operate this transceiver within 1 meter of the ship's navigational compass.

DO NOT recharge batteries except in methods described in this manual

DO NOT use this transceiver for inappropriate communications. Know and observe the FCC Rules for Marine Radio Operation.

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Unit Description

Flexible Antenna

Squelch Key

LCD Display Screen

Press To Talk (PTT) Key

Scan Key

Memory Key

Hi/Low Power-Lock Key

Channel Band Selection Key

Tri-Watch - Channel 16- Channel 9 - Key

Power/Backlighting Key

+/- Volume Control Keys

Weather/Regular Channel - Weather Alert Key

UP/DOWN Arrow Channel Selection Keys

Microphone

Battery Tray

Speaker

Unit Description

The VHF 720 is a 3 watt marine VHF communications transceiver in a convenient handheld package.

A keypad located on the front of the unit provides one-hand control of communication features. The knobless design allows push-button Squelch and Volume adjustment. A single button press provides a manual Squelch Override function. Tri-Watch monitoring mode allows simultaneous monitoring of emergency channel (16), calling channel (9) and a channel selected by the user. The channel 16/9 key allows you to toggle between emergency and calling channels.

A 1" high by 1-3/8" wide LCD display provides indication of all features and functions of the VHF 720. The scan feature allows the operator to select up to 10 channels for continuous monitoring in any combination of U.S.A., Canadian, and International bands.

The weather channel key toggles between regular channels and weather channels. It enables the weather alert mode when pressed and held for more than one second. The high/low key toggles the transmitter power level from between three watts and one watt. When held for more than one second, it locks and unlocks the "Key Lock" function to prevent inadvertent changing of unit settings and modes.

The power key turns the unit off and on and, when pressed briefly after the unit is powered on, enables the display backlighting feature. The weather/regular channel key enables or disables the weather alert function.

Small size and light weight characterize the portability of the GARMIN VHF 720.

Keys & Function Displays

Eleven keys provide access to all of the unit's features and functions. When any key (except the PTT key) is pressed, the unit will acknowledge by emitting a single beep confirmation tone. Some keys have dual functions.

Power/Backlighting Key

Power/Backlighting Key - This key turns on the unit when pressed and released, and turns the unit off when pressed and held for more than one second. Briefly pressing and releasing the power key when the unit is on will activate the backlighting feature and will last for five seconds after the last key is pressed.

Channel Up & Channel Down Keys

Channel Up and Channel Down Keys - Pressing these CH arrow keys sets the operating channel. Pressing these keys while the Squelch key is pressed and held, sets the squelch threshold level.

Weather Channel/ Regular Channel Key

Weather Channel/Regular Channel Key - Pressing and releasing this key will toggle between the ten weather channel band and the fifty-six regular channel band. Pressing this key for more than one second will activate the weather alert feature if a weather channel is currently displayed.

NOTE: *WX Alert Mode will interrupt regular use momentarily to monitor for a weather alert tone on the selected weather channel.*

Volume Increase & Volume Decrease Keys

Volume Increase and Volume Decrease Keys - Pressing the plus and minus keys increases or decreases the volume of received transmissions and audio tones.

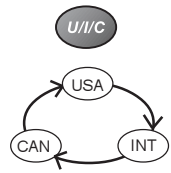
Memory Key - Pressing this key after selecting a channel places that channel into the scanning memory. Pressing this key when a channel is stored in memory (as indicated by the MEM icon on the display) will remove the channel from memory. A maximum of ten channels can be stored in memory.

Memory Key

Scan Key - Pressing this key starts the scanning of channels entered into memory. Pressing this key while scanning disables the scan feature while retaining the selected channels in memory.

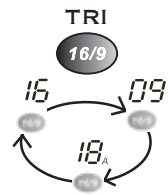
Scan Key

U/I/C *(USA, International/Canadian)* **Frequency Bands Key** - This key allows the operator to select from the three channel bands. Pressing and releasing the key sequences through the three bands. The band selected is displayed on the LCD screen.



U/I/C Frequency Bands Key

Channel 16/9 and Tri-Watch Key - This key provides the operator with a choice of three channel monitoring options. Pressing once will monitor channel 16 (the emergency channel). Pressing again will monitor channel 9 (the calling or hailing channel). Pressing a third time will return to the last used regular channel. Pressing and holding for more than one second will activate Tri-Watch to continuously monitor channels 16, 9 and a channel of your choice, from the regular or weather band.



Channel 16/9 & Tri-Watch Key

PTT *(Press To Talk)* **Key** - This Key allows the operator to transmit over those regular band channels that permit transmission. Press and hold the key to talk and release to receive.

PTT Key

Squelch Key

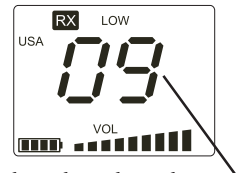
Squelch Key - This key breaks the squelch (unmutes the audio) when pressed and held. It is also used to set the squelch threshold (the level at which only strong signals can be received). The squelch threshold is set by pressing and holding the squelch key while using the **UP/ DOWN** keys to adjust the squelch level from 0 to 9. At level 0 (L0), all signals can be heard, while at level 9 (L9), only the strongest signals can be heard. Adjusting the squelch level eliminates weak, unwanted signals, as explained on page 17.

H/L Power Key

H/L (High/Low) **Power Key** - This key toggles the transmitter power level from **High** (3 watts) to **Low** (1 watt) when pressed and released. It also locks the keypad when pressed and held for more than one second.. The **Power** key, **PTT** key, backlighting key and the **Squelch** key still function in the Lock mode. Locking the keypad prevents inadvertent changing of channel settings and feature modes.

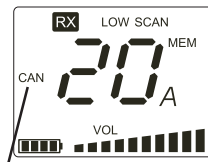
The VHF 720 LCD Display Screen gives indication of channels being monitored, battery power level, volume level, and the status of all unit features.

Channel Number Indicator - This large numeral display indicates the selected operating channel or the squelch threshold setting when the squelch key is pressed. This indicator is always active.



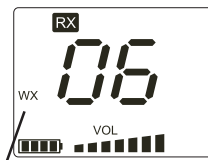
Channel Number Indicator

Channel Band Indicator - This display provides indication of the regular channel band selected, U.S.A., International, or Canadian.



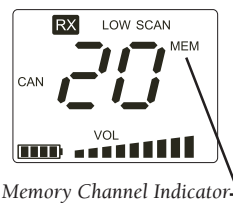
Channel Band Indicator

Weather *(WX)* **Channel Indicator** - This display provides indication that a weather channel is currently being monitored.



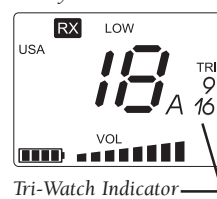
Weather Channel Indicator

Memory Channel Indicator - This display, in conjunction with the Channel Number Indicator, indicates that the channel number displayed has been entered into the unit memory for selection when the scan feature is active.

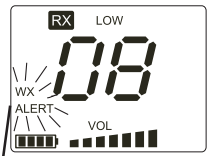


Memory Channel Indicator

Tri-Watch Indicator - This display appears along with the Emergency (16) and Call (9) Channel indicators to give notification that the Tri-Watch (three channel monitoring) feature is active.

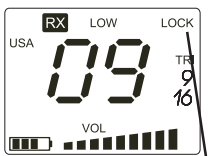


Tri-Watch Indicator



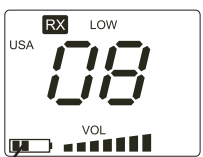
Weather Alert Indicator

Weather Alert Indicator - This display gives indication that the weather alert function has been activated. The display will flash whenever a weather alert tone is received.



Lock Indicator

Lock Indicator - This indicator is displayed when the Lock feature is active.



Battery Level Indicator

Battery Level Indicator - This battery shaped icon displays information about battery capacity in 25% increments. This indicator is always active.

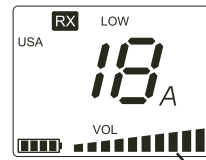
Squelch Indicator

Squelch Indicator - This display appears whenever the **SQ**, squelch key is presses for either squelch override or setting of the squelch threshold.

Low Battery Indicator

Low Battery Indicator - This indicator flashes on and off when the battery capacity drops to 10% or below.

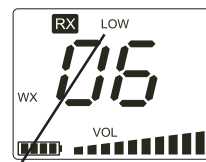
Volume Level Indicator - This band of gradually rising bars provides an indication of the volume setting. This indicator is always active.



Volume Indicator

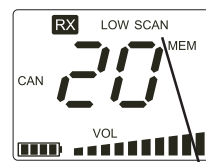
Hi/Low Power Indicators - These displays indicate the transmitter power level.

NOTE: *Some channels only permit transmission on Low while others allow only receive operation.*



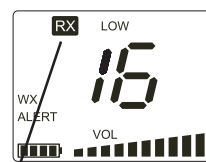
Hi/Low Power Indicator

Scan Indicator - This display provides indication that the **Scan** feature is active.



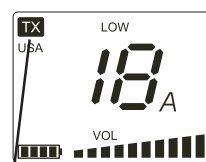
Scan Indicator

Receive *(RX)* **Indicator** - This indicator provides notice that a signal is being received by the unit.



Receive Indicator

Transmit *(TX)* **Indicator** - This indicator appears when you are using the VHF 720 to transmit and will come on when you hold down the PTT key.



Transmit Indicator

Important Information for First Time Users About Operating a Marine Radio

If you are a first time user of a marine radio, you should be aware of methods for operating your GARMIN VHF 720. Although, as explained on page iii, a Federal Communication Commission (FCC) license is no longer required for individual operator use, you must comply with all applicable FCC rules and regulations. We recommend that you obtain a copy of the "Maritime Radio users Handbook" an authoritative handbook prepared by the Radio Technical Commission for Maritime Services, Post Office Box 19087, Washington, D.C. 20036.

In some instances, such as commercial vessels, operators are required to obtain a license. You can obtain a license application from your nearest FCC field office. It is your responsibility to determine if you are required to apply for a license. If you have questions about the use of your marine radio you can contact the FCC Call Center at 1-888-CALL-FCC.

For safety and efficient navigation of vessels, the maritime radio frequency bands are separated into four groups. Specific frequencies within each are assigned for particular safety and functional applications, such as ship to shore communications, US Coast Guard use, and navigation in waterways and ports. You may not have access to some which are not-for-public-use frequencies, and you are required to monitor and use others which are safety and navigational procedure frequencies.

The four groups you will have occasion to use are the U.S.A. Regular Band of 52 channels, the Canadian Band of 56 channels, the International Band of 55 channels, and the Weather Band of 10 channels. Some of these are receive (listen) only, such as the weather channels.

The emergency channel 16 is restricted to hailing of other vessels, distress calls and safety purposes only. Known as the Hail and Distress Channel, it is used to contact nearby vessels and in emergencies where there is threat to life or property.

The calling or hailing channel 9 is used for establishing contact with another vessel as an alternate to channel 16. As channel 16 is often used so frequently that hailing vessels is not practical in some high traffic areas. Contact is made using channel 9 and then switched to another regular channel for exchange of information.

Maritime radio users are required to monitor channel 16, it is also advisable to monitor channel 9 and a weather channel as well. To facilitate these requirements, the VHF 720 is equipped with Tri-Watch and Weather Alert features that allow you to engage in regular channel communications and monitor both the emergency channel and the alternate calling channel while also being alerted of severe weather conditions.

Appendix C on pages 28 and 29 of this manual provides a listing of channels and the use of each, including those which are for receiving broadcast messages only.

Here is a grouping of the channels and a brief description of their use.

Channels 5,12, 14, 20, 65, 66, 73, 74,77: Port Operations - Can be used by any vessel for communications between ships and ship-to-coast stations for messages relating to operational handling, movement and safety of vessels in or near ports, locks or waterways. Channel 77 is limited to communications to and from commercial pilots in regard to movement and docking of vessels. Channels 11,12, 13, and 14 are used for traffic service on the Great Lakes, St. Lawrence Seaway and designated major ports.

Channel 6: Intership Safety - For use by any vessel for communicating navigational and weather warnings to other ships. Also used for communicating with the U.S. Coast Guard during search and rescue operations. Ship-to- ship communications only. Do not use for routine communications as this is a safety channel.

Channels 7, 8, 9, 10, 11, 18, 19, 67, 79, 80, 88: Commercial Vessels - Used for communication between vessels pertaining to the purpose for which the vessel is used. Limited communications between vessels and coast stations. Recreational boats are not permitted to use these channels. Channels 8, 67, and 88 may not be used for ship-to-coast communications. Channel 88 is not available on the Great Lakes and St. Lawrence Seaway.

Channels 9, 68, 69, 71, 72, 78: non-Commercial (Boat Operations) - Used by recreational boaters and others not engaged in commercial transport. Provides a communication channel pertaining to the needs of the vessel (maneuvers, berthing, provisioning, fueling, etc.). Used as a second receiver between ship-to-ship and ship-to-limited coast stations. Channel 72 may not be used for ship-to-coast communications and channel 9, the alternate calling channel, is shared with commercial vessels.

Channel 13: Navigation - used by any vessel for safety communications regarding the maneuvering of vessels or directing of a vessels movements. Ship-to-ship and secondarily ship-to-coast communications. Commonly called the Bridge-to-Bridge channel. For routine operations, radio power must be reduced to one watt.

Channel 15: Environmental - Used by any vessel to receive only broadcast information concerning environmental conditions in which vessel operate, such as, weather, sea conditions, time signals, and hazards to navigation. One-way broadcast from coast-to-ship stations.

Channel 16: Emergency - Used if your vessel is sinking or on fire, someone has been lost overboard, or there is grave and imminent danger to life or property. Every ship is obliged to give priority to radio distress communications. Calling - This channel is also used to establish communication with another marine radio station. After contact is made, switch to a working channel. Due to congestion on channel 16, particularly in high traffic areas, the FCC has approved channel 9 as a second hailing channel.

Channel 17: State Control - Used by state and local government vessels to coordinate, regulate and control boating activities and the rendering of assistance.

Channel 22: U.S. Coast Guard - For use by any vessel for exchange of communications with a U.S. Coast Guard station. Communication is ship-to-U.S. Coast Guard ship, and coast-to-aircraft station. Establish contact on channel 16 then shift to channel 22 as directed by the U.S. Coast Guard.

Channels 24, 25, 26, 27, 28, 84, 85, 86, 87: Marine Operator - Can be used by any vessel to place a telephone call to any place in the world or to a vessel outside their transmitting range. Used between vessels and public coast stations. You must contact a marine operator on the channel assigned to your navigating area.

Channels WX1, through WX10: Weather - Used by any vessel to receive continuous weather information from the National Oceanic and Atmospheric Administration (NOAA). This is a one-way broadcast to any interested parties. You are not allowed to transmit on these frequencies. A list of weather broadcast stations for the U.S. is contained in the "Maritime Radio Users Handbook". They provide continuous around-the-clock broadcasts of the latest weather information directly from the national Weather Service Offices. These channels are designated on Marine VHF equipment as WX1 through WX10, but are rarely used beyond WX7.

During severe weather, National Weather Service forecasters can interrupt routine weather broadcasts and substitute special warning messages. Specially designed warning receivers either sound an alarm indicating an emergency exits or tune into the weather frequency. The VHF 720 is equipped to sound the alarm tone and tune into the broadcast when the Weather Alert feature is activated.

Some channels will appear on the display with an "A" suffix. These are "Simplex Channels" receiving and transmitting on the same frequency. See "Selecting a Channel" on page 16 for a more detailed explanation. There are other regular channels in the list of channels on pages 28 and 29 that are not defined above. They have special uses that do not apply generally to regular maritime traffic and communications.

Installing the Antenna

The antenna is an essential part of your VHF 720 and the unit should never be operated without the antenna installed, as this may result in damage to the unit. The antenna receives signals best when held upright and is less effective when positioned horizontally.

To install the antenna:

1. Carefully align the bottom of the antenna with the threaded connector on the top of the VHF 720, and screw it on the until snug against the seating surface. *(Figure 1)*

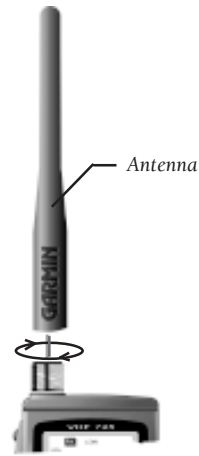


FIGURE 1

Installing the Battery Pack

The VHF 720 requires six AA alkaline cell batteries and will provide approximately 19 hours of operating time under normal use. Rechargeable alkaline, NiCad batteries or the optional GARMIN NiCad Battery Pack may also be used. The battery level indicator at the lower left corner of the unit LCD display gives indication of battery capacity in increments of 25%. If NiCad rechargeable batteries are used in the battery tray the battery gauge measurement will not accurately indicate battery capacity. However, the optional NiCad Battery Pack will be accurately indicated.

To install the batteries:

1. Lift up the D-Ring on the bottom of the unit and unscrew it to remove the battery tray. A coin may also be used to turn the screw. *(Figure 2)* Slide the Battery Tray from the bottom of the VHF 720.

2. Observe the label on the tray and the molded-in symbols to determine proper battery terminal orientation.

3. Insert six AA alkaline cells into the battery tray. Slide the retention strap over the center of the batteries to keep them in place. *(Figure 2)*

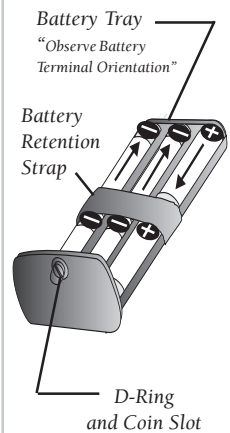


FIGURE 2

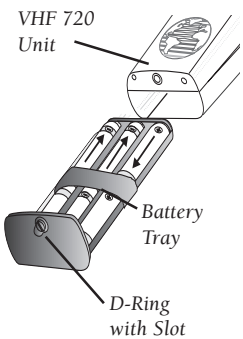
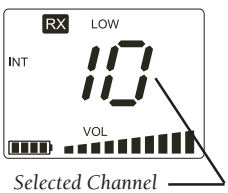


FIGURE 3



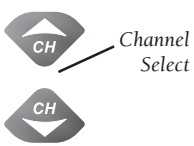


FIGURE 4

4. Slide the battery tray into the battery cavity in the base of the unit until the locking screw contacts the threaded hole in the base of the unit. *(Figure 3)*

5. Lift up the D-Ring on the screw in the battery Tray and use it or a coin to screw in the tray until snug. Press the D-Ring down so that it rests in the cavity in the tray base.

6. Press the **POWER** key to be certain the batteries have been properly installed and the unit is functioning. Check the Battery Level indicator on the LCD display to be certain you have installed fresh batteries.

NOTE: *Alkaline batteries should be removed from the unit when stored for extended periods (six or more months) to prevent leakage from expended cells.*

Selecting a Channel

To begin using the VHF 720 you will want to select a channel to monitor while you personalize the unit settings, such as volume and squelch. When you power-up the unit, a channel will automatically be selected, but it may not be suitable for making unit settings.

To select a channel:

1. Use the **U/I/C** Channel Band key to select USA, International, or Canadian channel bands. *(Figure 4)* The unit was set at the factory to channel 10 before shipment.

2. Press the **UP** or **DOWN** arrow key to scroll through the channels available on the selected band. *(Figure 4)* If you don't know which channel to select, refer to the Channel List in Appendix C on pages 28 and 29.

NOTE: *You will notice an "A" indicator adjacent to some channel numbers in the USA and Canadian bands. These are simplex channels (transmitting and receiving on the same frequency) while the Interna tional counterpart is a duplex channel (transmitting on one frequency while receiving on another.)*

Setting the Squelch Threshold

Setting the Squelch is important for reception of signals you want to hear. There are ten threshold levels, from 0, which allows all signals to be received, to 9, which allows only the strongest signal to be heard through the speaker. The diagram in Figure 5 demonstrates how setting the threshold level allows you to hear only the signals you desire, while weaker, unintelligible signals are not heard.

To set the Squelch threshold:

1. Adjust the Squelch to the lowest setting by pressing and holding the Squelch (**SQ**) key, then pressing the **DOWN** arrow key repeatedly until the display indicates "L0". You should hear static. If you hear a voice transmission, change to another channel and repeat this step. *(Figure 5)*

2. While holding the Squelch (SQ) key down, use the **UP** arrow key to increase the squelch level to "L1". If no static is heard, you have set an acceptable squelch threshold level. If you hear static, then increase to the next threshold level, repeating the process until unwanted static is eliminated. Release the **SQ** key to return to your selected channel. The squelch setting is universal for all channels, but it may require resetting from time to time

NOTE: *During squelch adjustment, Tri-Watch, Scan, and Weather Alert are suspended.*

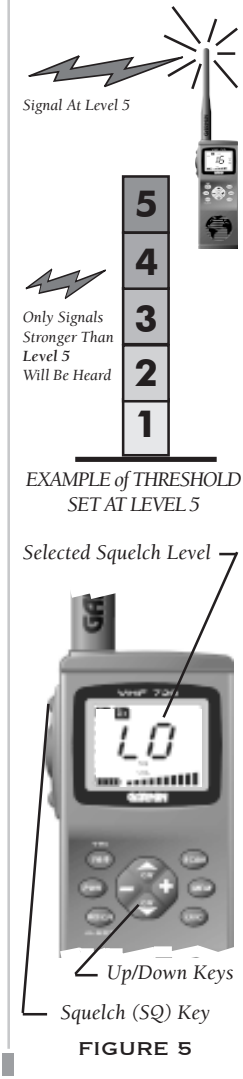


FIGURE 5

Adjusting the Volume

The Volume key may be adjusted using the **+/-** keys. The volume level is indicated by the band of gradually rising bars on the LCD display.

To adjust the volume:

1. Press the **+** key to increase the volume or the **-** key to decrease the volume. *(Figure 6)*

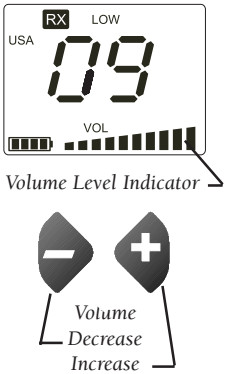


FIGURE 6

Scanning Channels

You may want to keep in contact with several vessels in your immediate area at the same time. For this purpose, the scan feature is available. You can program up to ten channels from any combination of USA, International, or Canadian bands into memory. Whenever a transmission is received, the scan will stop at that channel until the transmission ends and then move on until it recognizes another transmission. You cannot scan weather channels since they broadcast continually and do not allow a break in transmission for the scan to move to the next channel. You can utilize the WX Alert feature to monitor for severe weather conditions.

To scan channels:

1. Before activating the scan feature you must program at least two channels into memory. You can do this by pressing the **U/I/C** key to select the desired channel band and then use the **UP/DOWN** arrow keys to select channels in that band. Press the **MEM** key to place the displayed channel in the scan memory. *(Figure 7)*

2. Repeat this process for the desired channels.

3. Press the **SCAN** key to begin the scanning process. Pressing the **SCAN** key again will stop

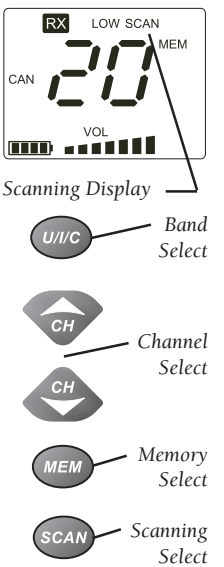


FIGURE 7

NOTE: *If the PTT key is pressed during scanning (when the display is changing) it will cancel SCAN and stop at the channel last scanned. If a channel is static (being received) you must transmit within 5 seconds after the received broadcast ends before SCAN moves to the next channel. After transmitting, scanning resumes when you release the key. Pressing any other keys will cancel the scan with the exception of the Power, Volume +, Volume -, Squelch and Hi/low keys.*

4. To remove a channel from the scan memory, simply access it with the **UP/DOWN** arrow keys and press the **MEM** key.

   NOTE: *Channels entered into memory will be retained when the unit batteries are removed.*

Tri-Watch

Tri-Watch is a method of monitoring the emergency channel 16 and the alternate hailing channel 9 while monitoring the channel you are using for communications.

To use Tri-Watch:

1. First determine which channel other than 16 and 9 that you desire to monitor, then use the **UP** or **DOWN** arrow keys to make a choice.

2. Press and hold the **TRI-16/9** key for more than one second. *(Figure 8)*

3. Observe the LCD display showing TRI-16-9, and the cycling set of channel numbers indicating that the TRI-WATCH feature is active.

4. Observe that when a transmission is received by the third channel, reception will be briefly interrupted to monitor channels 16 and 9. If reception is on channel 9 it will be interrupted to monitor channel 16. Channel 16 always has priority in TRI-WATCH.

5. To cancel the TRI-WATCH feature, press the **TRI-16/9** key to monitor only channel 16 or any other key to return to a selected channel.

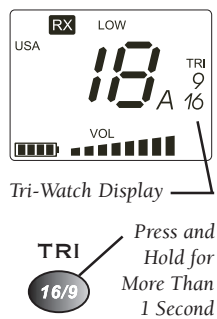


FIGURE 8

***NOTE:** If you enter channel 16 into memory for the Scan Mode, it will not have the priority it receives in the Tri-Watch Mode.*

Monitoring Weather Channels

There are ten weather channels which provide continual broadcasts of area weather information as provided by the National Weather Service. Typically, only the first seven channels are actively used.

To monitor weather channels:

1. Press the **WX/CH-ALERT** key to toggle between regular channel and weather channel bands. The WX symbol on the display screen will appear when you have accessed the weather band. *(Figure 9)*

2. Use the **UP/DOWN** arrow keys to select the weather channel broadcast for the area you are navigating.

   ***NOTE:** You can monitor channels to determine the area weather broadcast you desire to monitor or refer to the list of weather broadcast stations published in the "Maritime Radio Users Handbook".*

   *Once you have selected a weather channel you can toggle back and forth to the regular channel bands by pressing the **WX/CH ALERT** key.*

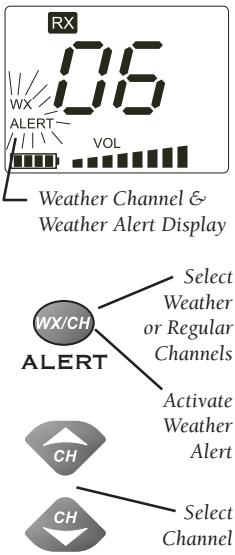


FIGURE 9

Weather Alert

The Weather Alert Feature can be activated to briefly monitor for a weather alert tone (every 5 seconds). You can choose a weather channel to monitor, activate the "WX Alert" feature then resume regular use of the radio. When a weather alert signal is detected the "WX ALERT" wording on the display will flash, and after an alert tone, the VHF 720 will automatically access the weather channel. It will increase the volume to mid-range, if set lower, and allow you to hear severe weather information.

To activate Weather Alert:

1. Press and hold the **WH/CH-ALERT** key for more than one second to activate this mode.

2. Return to regular use of the radio. You will hear a Weather Service beep tone and observe the flashing "WX Alert" display when a weather alert signal had been detected followed by the severe weather alert broadcast. *(Figure 9)*

3. To cancel the Weather Alert feature, press and hold the **WX/CH-ALERT** key or turn the unit off.

Receiving and Transmitting

Whenever the VHF 720 is powered-up (On) it is in the receiving mode. If the unit is monitoring a channel that is broadcasting, you will hear that transmission. It is possible to monitor any channel on any band, but transmission on some channels is not allowed. Many are receive only channels, while others are simply not intended for your category of radio use.

To receive on the VHF 720:

1. Press and release the **PWR** key to turn the unit on.

2. Observe that the display screen will come on and the last channel accessed will be displayed. If there is someone transmitting on that channel, you will hear their communication and the RX symbol will appear on the LCD display. You may now select from the many receiving options.

   NOTE: *For clearer reception, you can adjust the volume key up or down and set the squelch threshold to a level at which the audio will be enabled.*

Power Saving Tip!

To monitor the weather alert feature and save battery power:

1. Select a weather channel.
2. Initiate Weather Alert.
3. Reduce volume to minimum.
4. Press and hold the LOCK key.

The audio will mute and the VHF 720 will wake-up from a lower power mode to monitor for the weather alert tone every 5 seconds. Pressing any key that is functional during the LOCK mode will cancel the Low Power mode and switch to regular WX/Alert Mode. A weather alert tone from the National Weather Service will also cancel the Low Power mode and tune the receiver to the active weather alert channel at mid-volume level.

Receiving Mode Display

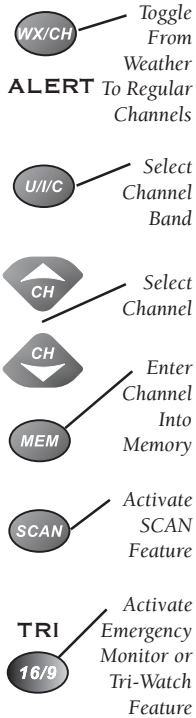


FIGURE 10

3. Press the **WX/CH** key to choose from weather channels or regular channels. *(Figure 10)*

4. Press the **U/I/C** key to select a channel band. *(Figure 10)*

5. Press the **UP/DOWN** arrow keys to select a channel. *(Figure 10)*

6. Press the **MEM** key when scrolling through the channels to enter up to ten channels in the SCAN memory. You must select at least two for the SCAN feature to activate. *(Figure 10)*

7. Press the **SCAN** key to monitor the selected channels. *(Figure 10)*

8. Press the **16/9** key once if you want to monitor the emergency channel (16). *(Figure 10)*

9. Press the **16/9** key twice if you want to monitor the alternate calling channel (9).

10. Press and hold the **16/9** key if you want to activate the TRI-WATCH feature in order to monitor the emergency, the alternate calling and one regular channel simultaneously.

To transmit on the VHF 720:

1. Perform Steps 1 through 5 of the procedure for receiving, above.

2. Choose a correct channel for communications. Channels are restricted to use by various government agencies, types of vessels and maritime service operators. Review the list in Appendix C to determine which channels are available for your use.

3. Wait until the channel you have selected is free of communications. THIS IS AN FCC REQUIREMENT!

   NOTE: *For communications over short distances, press the* ***H/L*** *key until "LOW" is displayed on the LCD. This reduces transmission power to one watt, prolonging battery life.*

4. Press and hold the **PTT** (Press To Talk) key and begin your transmission. The TX symbol will appear on the LCD display. *(Figure 11)*

5. Speak directly into the microphone on the front of the unit *(see page 2)* and hold the unit vertically 1 to 2 inches from your mouth.

   NOTE: *VHF Marine Radios communicate over distance by "Line-of-Sight", which means that the signal may be blocked by objects such as land forms, large vessels, etc. It is therefore important to transmit with the antenna in a vertical position and with the radio positioned as far above the water as is feasible.*

6. Release the **PTT** key when you have completed your transmission.

   NOTE: *You must use a specific communication style when using a marine radio, such as your station call sign or boat name and ending your transmission with proper terminology such as "Over". Refer to the "Maritime Radio User's Handbook". Also be aware that the unit will automatically cancel TX after the PTT key has been pressed for more than thirty seconds to limit extensive transmissions and protect the unit from damage.*

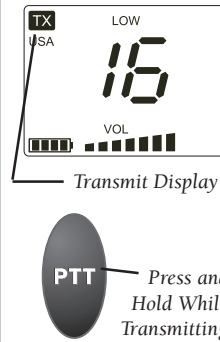


FIGURE 11

The FCC prohibits the following communications:

- *False distress or emergency messages*
- *Messages to "Any Boat" except in emergencies and radio tests*
- *Messages to or from a vessel on land and transmission while on land*
- *Obscene, indecent, or profane language (potential fine of $10,000)*

7. Remember to return to monitoring of Channel 16 by pressing the **16/9** key once when not using another channel.

Backlighting the LCD Display

The backlighting feature is used to improve readability of the LCD display in dim light.

1. Press and release the **PWR** key after the unit has powered on. The display will be illuminated for 5 seconds after the last key press before cycling off.

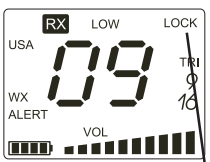
NOTE: *Press this key anytime you require visual reference in dim light.*

Using the Key Lock Feature

If you desire to maintain a selected function on your VHF 720, such as TRI-WATCH, SCAN, or Weather Alert, you can lock the keys using the Lock feature to prevent inadvertent canceling or changing of unit settings. However, the Press-To-Talk, Squelch, and Power keys still function.

1. Press the **H/L-LOCK** (Hi/Low transmission power) key for more than one second after you have set the unit to the function desired. When the unit keypad is locked, the "LOCK" message will be displayed on the LCD screen. *(Figure 12)*

2. To cancel the lock feature, press the **H/L-LOCK** key again for more than one second or turn Off the unit using the **POWER** key.



Key Lock Display

Press and Hold for More Than 1 Second

FIGURE 12

Standard Accessories & Replacement Components

(Included with the VHF 720)

Antenna..... Part Number: 700-00010-00
Alkaline Battery Pack *(Requires six "AA" Cells)*
..... Part Number: 011-00415-00
Wrist Strap..... Part Number: 013-00027-00
Belt Clip..... Part Number: 145-00327-00
Belt Clip Mounting Screws..... Part Number: 211-54307-11
Owner's Manual..... Part Number: 190-00150-00
Contact GARMIN Customer Service to obtain replacement parts.
Refer to Page 15 for Antenna and Battery Installation.

Installing the Belt Clip and Wrist Strap

The VHF 720 is supplied with a belt clip and carrying strap so you can carry the unit wherever you go. Attach the clip to the back of the unit using the two mounting screws provided. To attach the wrist strap, thread the cord portion of the strap through the slot in the clip then insert the solid end of the strap through the loop formed by the cord, pulling it through until snug. *(Figure 13)*

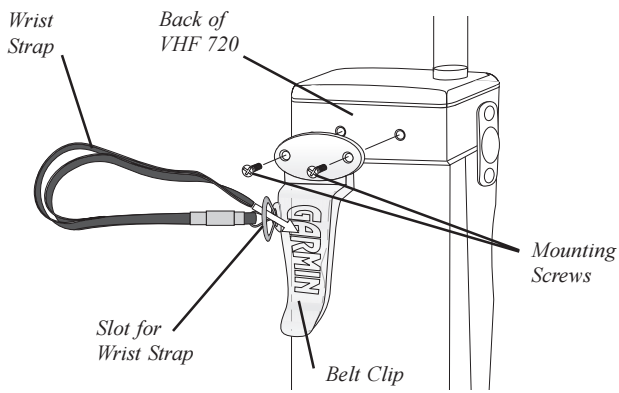


FIGURE 13

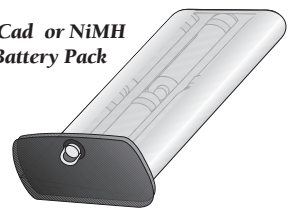
Optional Accessories

NiCad Battery Pack Kit *(U.S. Version - Includes Charging Unit, Battery Pack and Mounting Bracket)* ..... Part Number: 010-10188-00
Spare NiCad Battery Pack..... Part Number: 010-10189-00
NiMH Battery Pack..... Part Number: 010-10245-00
Cigarette Lighter Charging Cable Assy... Part Number: 010-10190-00
Charging Unit *(U.S. Version 120 VAC)*..... Part Number: 010-10247-00
Mounting Bracket/Charging Stand..... Part Number: 010-10191-00
Carry Holster with Belt Loop..... Part Number: 010-10219-00
Contact your GARMIN Dealer to obtain these optional accessories.

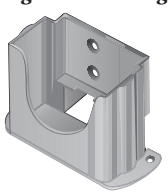
VHF 720 Optional Accessories:

NiCad Battery Pack Kit
Includes rechargeable NiCad Battery Pack, Mounting Bracket/Charging Stand, and 120 VAC Charging Unit.

NiCad or NiMH Battery Pack



Mounting Bracket/Charging Stand



120 VAC Charging Unit

Carry Holster with Belt Loop
Rugged nylon holster with integral belt loop.

Cigarette Lighter Charging Cable Assembly
Charges the battery pack using a 12 volt power source.

APPENDIX B

Specifications

Physical:

	Size:	5.5”H x 2.0”W x 1.3”D (14.0 x 5.0 x3.3cm)
	Weight:	Approximately 12.1 oz (.35Kg)
	Temperature Range:	-4 to +158 degrees F (-20 to + 70 degrees C)

Transceiver:

	Frequency Bands:	All U.S., Canadian, and International marine channels plus 10 weather channels
	Channel Spacing:	25kHz
Receiver:		
	Selectivity:	Adjacent channel selectivity, 65dB Intermodulation rejection, 65dB Spurious Image Response, 65dB
	Sensitivity (FM): (WX):	> 12dB SINAD at 0.3 microvolt > 12dB SINAD at 0.3 microvolt
	Squelch Sensitivity: (Threshold)	-123dBm to -107dBm
	Audio Power:	0.5 W into 16 ohm speaker
	Audio Distortion:	< 10%
	Hum and Noise:	< 40dB
Transmitter:		
	Transmitter Output:	3 watts high/1 watt low
	Frequency Stability:	+/- 10 PPM
	Hum and Noise:	< 40dB
	Duty Cycle:	No damage, even if continuously keyed
	Microphone:	Internal, electret
	Compliance:	FCC Part 87
Power:		
	Operating Voltage:	8.0 VDC
	Source: Standard Optional	(6) “AA” alkaline battery cells (6) “AA” NiCad rechargeable cells NiCad Battery Pack NiMH Battery Pack
	Battery Life*:	19 hours with 6 “AA” alkaline cells 16 hours with optional NiCad Battery Pack 24 hours with optional NiMH Battery Pack 12 hours with 6 “AA” rechargeable alkaline cells
	Current Consumption:	Receive: < 50mA Transmit, high power: < 1.0A Transmit, low power: < 0.6A

* Tested using 5% TX (High), 5% RX, 90% Standby Duty Cycle

APPENDIX C

VHF Channel List

Channel Number			Frequency (MHz)		Type of Traffic	Function	
USA	CAN	INT	TX	RX		Ship to Ship	Ship to Shore
	01	01	156.050	160.650	Com'l, Port Ops, VTS	Yes	Yes
01A			156.050	156.050	Com'l, Port Ops, VTS	Yes	Yes
	02	02	156.100	160.700	Port Ops	Yes	Yes
	03	03	156.150	160.750	Com'l, Port Ops, VTS	Yes	Yes
03A			156.150	156.150	Com'l, Port Ops, VTS	Yes	Yes
		04	156.200	160.800	Port Ops	Yes	Yes
	04A		156.200	156.200	Port Ops	Yes	Yes
		05	156.250	160.850	Port Ops, VTS	Yes	Yes
05A	05A		156.250	156.250	Port Ops, VTS	Yes	Yes
06	06	06	156.300	156.300	Safety	Yes	No
		07	156.350	160.950	Com'l	Yes	Yes
07A	07A		156.350	156.350	Com'l	Yes	Yes
08	08	08	156.400	156.400	Com'l	Yes	No
09	09	09	156.450	156.450	Com'l & Non-Com'l	Yes	Yes
10	10	10	156.500	156.500	Com'l	Yes	Yes
11	11	11	156.550	156.550	Com'l, VTS, SMS	Yes	Yes
12	12	12	156.600	156.600	Port Ops, VTS, SMS	Yes	Yes
13			156.600	156.600	Navigational	1 watt, int.	No
	13	13	156.650	156.650	Navigational	Yes	No
14	14	14	156.700	156.700	Port Ops	Yes	Yes
15			NO TX	156.750	Environmental	RX Only	-
	15	15	156.700	156.700	Environmental	1 watt Only	-
16	16	16	156.800	156.800	Distress, Safety, Calling	Yes	Yes
17	17	17	156.850	156.850	State Control	1 watt Only	Yes
		18	156.900	161.500	Com'l	Yes	Yes
18A	18A		156.900	156.900	Com'l	Yes	Yes
		19	156.950	161.550	Com'l	Yes	Yes
19A	19A		156.950	156.950	Com'l	Yes	Yes
20		20	157.000	161.600	Port Ops	Yes	Yes
	20		157.200	161.650	Port Ops	1 watt Only	Yes
		21	157.050	161.650	U.S. Govt. Only	Yes	Yes
21A	21A		157.050	157.050	U.S. Govt. Only	Yes	Yes
		22	157.100	161.700	Coast Guard	Yes	Yes
22A	22A		157.100	157.100	Coast Guard	Yes	Yes
	23	23	157.150	161.750	U.S. Govt. Only	Yes	Yes
23A			157.150	157.150	U.S. Govt. Only	Yes	Yes
24	24	24	157.200	161.800	Public Corresp.	No	Yes
25	25	25	157.250	161.850	Public Corresp.	No	Yes
26	26	26	157.300	161.900	Public Corresp.	No	Yes
27	27	27	157.350	161.950	Public Corresp.	No	Yes
28	28	28	157.400	162.000	Public Corresp	No	Yes
	60	60	156.025	160.625	-	-	-
		61	156.075	160.675	-	-	-
61A	61A		156.075	156.075	-	-	-
		62	156.125	160.725	-	-	-
	62A		156.125	156.125	-	-	-

VHF Channel List

Channel Number			Frequency (MHz)		Type of Traffic	Function	
USA	CAN	INT	TX	RX		Ship to Ship	Ship to Shore
		63	156.175	160.775	-	-	-
63A			156.175	156.175	-	-	-
	64	64	156.225	160.825	-	-	-
64A	64A		156.225	156.225	-	-	-
		65	156.275	160.875	Port Ops.	No	Yes
65A	65A		156.275	156.325	Port Ops.	No	Yes
		66	156.325	160.925	Port Ops.	Yes	Yes
66A			156.325	156.325	Port Ops.	Yes	Yes
	66A		156.325	156.325	Port Ops.	1 watt Only	Yes
67	67	67	156.375	156.375	Com'l.	Yes	No
68	68	68	156.425	156.425	Non Com'l	Yes	Yes
69	69	69	156.475	156.475	Non Com'l	Yes	Yes
70	70	70	NO TX	156.525	Digital Selective Calling	Yes	No
71	71	71	156.575	156.575	Non Com'l	Yes	Yes
72	72	72	156.625	156.625	Non Com'l	Yes	No
73	73	73	156.675	156.675	Port Ops.	Yes	Yes
74	74	74	156.725	156.725	Port Ops.	Yes	Yes
77	77		156.875	156.875	Port Ops.	1 watt int.	Yes
		77	156.875	156.875	Port Ops.	Yes	Yes
		78	156.925	161.525	Non Com'l	Yes	Yes
78A	78A		156.925	156.925	Non Com'l	Yes	Yes
		79	156.975	161.575	Com'l	Yes	Yes
79A	79A		156.975	156.975	Com'l	Yes	Yes
		80	157.025	161.625	Com'l	Yes	Yes
80A	80A		157.025	157.025	Com'l	Yes	Yes
		81	157.075	161.675	U.S. Govt. Only	Yes	Yes
81A	81A		157.075	157.075	U.S. Govt. Only	Yes	Yes
		82	157.125	161.725	U.S. Govt. Only	Yes	Yes
82A	82A		157.125	157.125	U.S. Govt. Only	Yes	Yes
	83	83	157.175	161.775	U.S. Govt. Only	Yes	Yes
83A	83A		157.175	157.175	U.S. Govt. Only	Yes	Yes
84	84	84	157.225	161.825	Public Corresp.	No	Yes
85	85	85	157.275	161.875	Public Corresp.	No	Yes
86	86	86	157.325	161.925	Public Corresp.	No	Yes
87	87	87	157.375	161.975	Public Corresp.	No	Yes
88	88	88	157.425	162.025	Public Corresp.	No	Yes
88A			157.425	157.425	Public Corresp.	No	Yes
Weather Channels - Receive Only							
WX1			162.550		Weather	No	Yes
WX2			162.400		Weather	No	Yes
WX3			162.475		Weather	No	Yes
WX4			162.425		Weather	No	Yes
WX5			162.450		Weather	No	Yes
WX6			162.500		Weather	No	Yes
WX7			162.525		Weather	No	Yes
WX8			161.650		Weather	No	Yes
WX9			161.850		Weather	No	Yes
WX10			162.000		Weather	No	Yes

Storage:

Store the VHF 720 in a cool, dry location when not used for prolonged periods. When stored for more than six months, remove alkaline batteries to prevent leakage from expended cells. While the GARMIN VHF 720 is designed to withstand immersion in water (with or without the battery pack in place) it should be treated like all quality electronic equipment. Wipe away any water accumulation from the surface of the unit and use a paper towel or other absorbent material to wick out any moisture from the battery cavity. Exposure of battery terminals to salt spray may cause corrosion and loss of conductivity. Be certain to keep contacts dry and away from corrosive elements. Storage temperature should not vary from: below -4 degrees F (-20 degrees C) and above 158 degrees F (70 C)

Cleaning:

Clean exterior portions of the VHF 720 with a mild soap and water solution. Do not use harsh detergents or solvent based cleaning agents. Isopropyl alcohol is acceptable. Wipe dry with a clean, non-abrasive cloth.

Submersion in Water:

The VHF 720 is constructed to meet IEC Standard 529 IPX7. It can withstand submersion in 1 meter of water for up to 30 minutes. Note that, while the unit is designed to operate after submersion, meaning; if dropped in water and retrieved quickly, it should suffer no damage. Prolonged submersion may cause damage to the unit. After submersion be certain to remove the battery pack and dry the battery contacts and the battery cavity, as the battery cavity is separated from the rest of the unit and can allow water intrusion.

Battery Maintenance:

Keep battery contacts clean. Use only the types of batteries specified for use with the VHF 720. The VHF 720 battery tray accepts six (6) standard "AA" alkaline, rechargeable alkaline or rechargeable NiCad cells. It is advisable to maintain a supply of replacement batteries if the VHF 720 is to be placed in service for a prolonged period where replacement batteries cannot be easily obtained.

NOTE: *Whenever possible, transmit with 1 watt power to prolong battery life.*

When Using The NiCad or NiMH Battery Pack*:

Fully charge the battery pack before its first use. The battery pack requires 12 hours for a full charge and should not be charged in excess of this time period.. Charge only with the VHF 720 Charging Unit provided with the Battery Pack. Partially discharging a nickel-cadmium battery and then recharging it causes a phenomenon referred to as "memory reset". When a battery that is not fully discharged is then recharged, it resets the memory in proportion to the amount of previous discharge, resulting in a gradually decreasing recharge capacity. To ensure that this type of battery pack retains its full capacity, it should be almost fully discharged (when the battery symbol blinks) and then recharged completely after every few cycles of use.

* Municipal Law requires for environmentally sound collection and recycling or disposal of nickel-cadmium and Nickel Metal Hydride batteries. Contact your local waste management official for instructions on disposal.

Service and Repairs:

The GARMIN VHF 720 is warranted for three years under the terms of the GARMIN Limited Warranty on Page 36 of this manual. If you need to obtain warranty service for your unit, call the GARMIN Product Support Department (913-397-8200) for a returned merchandise tracking number. The unit should be securely packaged with the tracking number clearly marked on the outside of the package and sent freight prepaid and insured to GARMIN warranty service station. A copy of the original sales receipt is required as proof of purchase for warranty repairs. GARMIN reserves the exclusive right to repair or replace the unit or software at its sole discretion. If your unit is no longer under warranty, GARMIN will make repairs at the GARMIN current labor rate and parts costs. Units repaired in this manner are warranted for 90 days from the date of return to the owner.

APPENDIX D

Maintenance & Troubleshooting

Troubleshooting Guide		
SYMPTOM	**PROBABLE CAUSE**	**REMEDY**
Unit does not come ON	Batteries are exhausted.	Recharge batteries
No sound from speaker	Squelch threshold level too high.	Set to a lower threshold point.
	No channel broadcast is being received	Move to another channel.
	Volume is set too low.	Increase volume.
Cannot transmit or transmission isn't being received.	Some channels are for receive only.	Change channel.
	Batteries are exhausted.	Replace batteries.
	Some channels are for low power only.	Change channels.
	Output power too low.	Press H/L key for high power.
The displayed channel cannot be changed.	The LOCK function is on.	Press and hold the H/L key for at least one second.
Error tone (2 beeps) is heard when a key is pressed and no unit function is performed.	Incorrect key selection and the programming is limiting key function.	Select correct key.

Messages

The VHF 720 responds to operating conditions in two ways, LCD Display screen messages and audio tones. These messages provide notification of errors in operation or the status of VHF 720 features.

Audio Messages

Confirmation Tones - These tones, consisting of a single "Beep", are audible whenever you press a key on the unit and confirm that unit is responding to your action.

Error Tones - These tones, consisting of two beeps and in some instances a continuous string of beeps, and indicate that you have pressed a key that cannot perform a function under the current unit operating mode.

Screen Messages

"LOW BATT" - This display appears when the battery capacity has dropped to 10% of its capacity. The "LOW BATT" display flashes and an initial three beep tone will be heard. The unit will operate under normal use for approximately 30 more minutes.

"WX ALERT" - When the Weather Alert feature is activated by a weather alert broadcast, the weather alert tone will be heard and the "WX ALERT" display will flash. The receiver will be tuned to the weather channel and audio will be unmuted at the user setting or mid range volume level, whichever is greater.

"TX" and "RX" - If these two icons flash together or the "TX" only flashes whenever the PTT key is pressed, the unit must be serviced. Contact the GARMIN Product Support Department at (1-800-800-1020) or (913-397-8200) for information.

APPENDIX F

Glossary

Glossary of Radio Terminology and Abbreviations

Canadian Channels: Channel designations as defined by the International Telecommunications Service, (ITS).

Duplex: Transmit and receive on different frequencies.

FM: Frequency Modulation

International Channels: Channel designations as defined for use in international waters by the ITS.

PTT: Press-To-Talk switch

RF: Radio Frequency

RX: Receive

Simplex: Transmit and receive on the same frequency.

Squelch: To suppress background noise.

Tri-Watch: Monitors Channels 16 and 9 while working on yet another user designated channel.

TX: Transmit

U.S.A. Channels: Channel designations as defined by the FCC.

VHF: Very High Frequency (30 MHz to 300 MHz)

Weather Channels: Channel designations as defined by the FCC.

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APPENDIX H

Warranty

LIMITED WARRANTY

GARMIN Corporation warrants this product to be free from defects in materials and manufacture for three years from the date of purchase. GARMIN will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation costs. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

To obtain warranty service, call the GARMIN Customer Service department (913-397-8200) for a returned merchandise tracking number. The unit should be securely packaged with the tracking number clearly marked on the outside of the package and sent freight prepaid and insured to a GARMIN warranty service station. A copy of the original sales receipt is required as the proof of purchase for warranty repairs. GARMIN retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

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