



STANDARD HORIZON

HX470S

Submersible Dual Band Marine Portable

Owner's Manual



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Congratulations on your purchase of the **HX470S**! Whether this is your first portable marine VHF transceiver, or if you have other STANDARD HORIZON equipment, the STANDARD HORIZON organization is committed to ensuring your enjoyment of this high performance transceiver, which should provide you with many years of satisfying communications even in the harshest of environments. STANDARD HORIZON technical support personnel stands behind every product sold, and we invite you to contact us should you require technical advice or assistance.

We appreciate your purchase of the **HX470S**, and encourage you to read this manual thoroughly, so as to learn and fully understand the capabilities of the **HX470S**.

WARNING

This radio is capable of transmitting on VHF Marine and FRS.

The FCC allows the use of VHF Marine band on water areas only. However the FCC does not allow the use of the VHF Marine band when on land. If persons use the VHF Marine Band on land and interfere with others communicating, the FCC will be notified and search for the interference. Responsible parties found to be transmitting on the VHF Marine Band on land could be fined up to \$10,000 for the first offense.

FRS Band may be used on the land and water. The FCC does however prohibit the use in aircraft.



RF EXPOSURE SAFETY STATEMENT

SAFETY INFORMATION

Your wireless handheld portable transceiver contains a low power transmitter. When the Push-to-Talk (PTT) button is pushed, the transceiver sends out radio frequency (RF) signals. In August 1996, the Federal Communications Commission adopted RF exposure guidelines with safety levels for hand-held wireless devices.

This device is authorized to operate at a duty factor not to exceed 50% (this corresponds to 50% transmission time and 50% reception time).

WARNING: To maintain compliance with the FCC's RF exposure guidelines, this transmitter and its antenna must maintain a separation distance of at least 1 inch (2.5 centimeters) from your face. Speak in a normal voice, with the antenna pointed up and away from the face at the required separation distance.

If you use a headset accessory for this radio, with the radio worn on your body, use only the Vertex Standard belt clip for this transceiver, and ensure that the antenna is at least 1 inch (2.5 centimeters) from your body when transmitting.

Use only the supplied antenna. Unauthorized antennas, modifications, or attachments could damage the transmitter, and may violate FCC regulations.

NOTE

This radio telephone complies with the requirements of RTCM Paper 56-95/SC101 Standards for digital selective calling (DSC) for Marine transceivers.



FCC AND CANADA RADIO LICENSE INFORMATION

Standard Horizon radios comply with the Federal Communication Commission (FCC) and Industry-Canada requirements that regulate the Maritime Radio Service.

MARITIME STATION LICENSE

An FCC ship station license is no longer required for any vessel traveling in U.S. waters which uses a VHF marine radio, RADAR or EPIRB, and which is not required to carry radio equipment. However, any vessel required to carry a marine radio on an international voyage, carrying a HF single side band radiotelephone or marine satellite terminal. FCC license forms, including applications for ship (506) and land station licenses can be downloaded via the Internet at www.fcc.gov/forms. To obtain a form from the FCC, call (888) 225-5322.

MARINE RADIO CALL SIGN

Currently the FCC does not require recreational boaters to have a Ship Radio Station License. The USCG recommends the boats registration number and the state to be used.

CANADIAN SHIP STATION LICENSING

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

**Industry Canada
Radio Regulatory Branch
Attn: DOSP
300 Slater Street
Ottawa, Ontario
Canada, K1A 0C8**

FCC/INDUSTRY CANADA INFORMATION

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

FCC Type Accepted: Part 80
Output Power with FNB-80LI: 1 W (Low), 2.5 W (Mid), and 5 W (High)
Emission: 16K0G3E, 16K0G2B
Frequency Range: 156.025 to 163.275MHz
FCC Type Number: K66HX470S
Industry Canada Type Approval: 511B-HX470S V



FRS LICENSING

No FCC license is required to use the FRS Frequencies. You are allowed to operate the **HX470S** on the FRS channels if you are not a representative of a foreign government, and if you cooperate in the selection and use of channels in order to reduce interference to others. There is no need to identify your transmissions with a call sign; however you must monitor the channel before transmitting to reduce interference with other stations.



FCC NOTICE

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

NOTICE

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

- ☐ Increase the separation between the equipment and receiver.
- ☐ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ☐ Consult the dealer or an experienced marine electronics technician for help.



1. GENERAL INFORMATION

1.1 INTRODUCTION

The **HX470S** is a SUBMERSIBLE miniature 5-Watt portable two way Dual Band marine transceiver. The transceiver has all allocated USA, International, or Canadian channels. It has emergency channel 16 which can be immediately selected from any channel by pressing the [**16/9**] key. NOAA Weather channels can also be accessed immediately by pressing the [**WX**] key. In addition to these functions the **HX470S** can transmit a Digital Selective Distress Call with Latitude/Longitude when a GPS is connected to the **CD-25** Cradle Charger.

Besides VHF marine transceiver operation, the **HX470S** provides FRS (Family Radio Service) 460 MHz (0.5 Watts) transceiver operation, receive ONLY coverage of AM, FM broadcast bands, AM aircraft bands, and MURS.

The **HX470S** includes the following features: Memory Scanning, Priority Scanning, NOAA Weather Alert, Battery Saver, easy-to-read large LCD display, EEPROM memory back-up, Battery Life displayed on LCD, and a transmit Time-Out Timer (TOT).

In the marine band, the transmitter provides a maximum of 5 Watts output, and has the selection of 2.5 Watts and 1 Watt to assist the user in ensuring maximum battery life.

The optional **SU-1** Barometric Pressure Sensor Unit can be installed to provide readout of the current barometric pressure.

Or (not simultaneously)

The optional **FVP-31** Voice Scrambler can be installed to permit secure voice communications with other Standard Horizon radios with the FVP-31 or CVS2500 scramblers installed.

2. ACCESSORIES

2.1 PACKING LIST

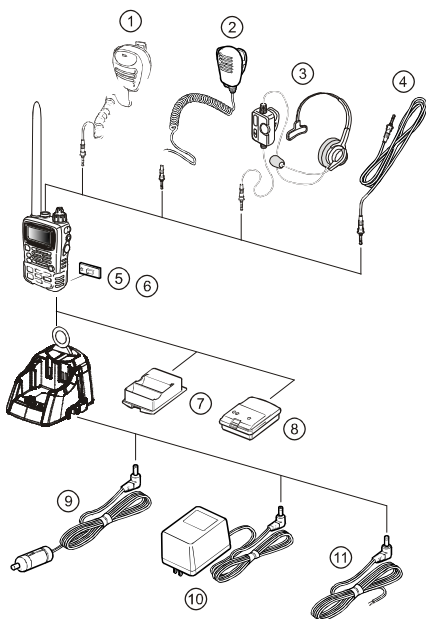
When the package containing the transceiver is first opened, please check it for the following contents:

- ☐ **HX470S** Transceiver
- ☐ **FNB-80LI** 1300 mAh Lithium Ion Battery Pack
- ☐ **CD-25** Charger Cradle for **HX470S**
- ☐ **NC-72B** 120VAC Wall Charger for **CD-25**
- ☐ **E-DC-19** DC Cable with 12 V Cigarette Lighter Plug for **CD-25**
- ☐ **CLIP-14** Belt Clip with screw
- ☐ Lanyard
- ☐ Owner's Manual

2.2 OPTIONS

- ① **CMP460** Noise-canceling Waterproof Speaker/Microphone
- ② **MH-57A4B** Mini Speaker/Microphone
- ③ **VC-24** VOX Headset
- ④ **CT-32** Clone Cable
- ⑤ **SU-1** Barometric Pressure Sensor Unit
- ⑥ **FVP-31** Voice Scrambler
- ⑦ **FBA-23** Alkaline Battery Case
- ⑧ **FNB-80LI** 1300mAh Lithium Ion Battery Pack
- ⑨ **E-DC-19** DC Cable with 12 V Cigarette Lighter Plug
- ⑩ **NC-72C** 230-240 VAC Wall Charger for the **FNB-80LI**
- ⑪ **E-DC-6** DC Cable; plug and wire only

Note: Before operating the **HX470S** for the first time, it is recommended that the battery be charged. Please see section 4.1.4 "USING THE CD-25 CHARGER CRADLE" for details.



3. ABOUT THIS RADIO

3.1 ABOUT THE VHF MARINE BAND

WARNING:

The radio frequencies used in the VHF marine band lie between 156 and 158 MHz with NOAA Weather stations available between 161 and 163 MHz. The marine VHF band provides communications over distances that are essentially “line of sight” Actual transmission range depends much more on antenna type, gain and height than on the power output of the transmitter. On a fixed mount 25W radio transmission expected distances can be greater than 15 miles, for a portable 5W radio transmission the expected distance can be greater than 5 miles in “line of sight”.



The user of a Marine VHF radio is subject to severe fines if the radio is used on land. The reasoning for this is you may be near an inland waterway, or propagation anomalies may cause your transmission to be heard in a waterway. If this occurs, depending upon the marine VHF channel on which you are transmitting, you could interfere with a search and rescue case, or contribute to a collision between passing ships. *For VHF Marine channel assignments refer to page 47 section 16.*

3.2 ABOUT FRS (FAMILY RADIO SERVICE)

FRS is a private, two-way, very short-distance voice communications service for facilitating family and group activities



Areas of Operation

You may operate your FRS radio in the United States and certain locations specified by the FCC [95.192].

If you want to use FRS aboard a vessel or aircraft owned or operated by a U.S. citizen or company, you will need permission from the captain of the vessel.

You must share the channel with other users [95.191(b)]. There is no meaningful way to share the channel with others unless you listen before transmitting and wait until the channel is available before you transmit. To listen

FRS CHANNEL CHART							
1	462.5625 MHz	5	462.6625 MHz	9	467.5875 MHz	13	467.6875 MHz
2	462.5875 MHz	6	462.6875 MHz	10	467.6125 MHz	14	467.7125 MHz
3	462.6125 MHz	7	462.7125 MHz	11	467.6375 MHz	-	- - -
4	462.6375 MHz	8	467.5625 MHz	12	467.6625 MHz	-	- - -

to the channel, you must disable any tone squelch.

Also, you must at all times and on all FRS channels, give priority to emergency messages [95.193(d)].

Refer to page 23 (reception), 24 (transmitting), and 33 (CTCSS) for operation.

3.3 ABOUT RECEIVE ONLY CHANNELS and FREQUENCIES

AM/FM Broadcast Bands

The AM/FM bands contained within the **HX470S** are the same channels you use every day to listen to music, news and commentary with your car or home stereo.

The AM broadcast band currently extends from 530 to 1700 kHz. Channels are spaced in even 10 kHz increments; i.e.: 530, 540, 550, ... , 1600 kHz in the United States and Canada. Elsewhere, channels are spaced in 9 kHz increments, i.e.: 531, 540, 549, etc.



The FM broadcast band in the United States extends from 88 to 108 MHz. Channels are assigned at 200 kHz increments; i.e.: 88.1, 88.3, 88.5, ... , 107.9. The channels from 88.1 to 91.9 are reserved for non-commercial educational stations. Outside the United States and Canada, the boundaries and channel spacing vary. In Japan, the band starts at 76 MHz. In Western Europe, the band generally runs from 88-108 MHz, but channels can be irregularly spaced, i.e.: 101.25 MHz.



AIR (Aircraft) Bands

The AM VHF aeronautical communications band lies between 108.000 MHz and 136.975 MHz. This frequency spectrum can be divided into a lower and upper range. The lower range between 108.000 MHz and 118.000 MHz is primarily used for navigational aids such as the ILS - Instrument Landing Systems, DME - Distance Measuring Equipment, and VOR's - Very High Frequency Omni Range. The lower range offers very little in the way of voice communications, it does however provide someone with a working knowledge of Morse code the opportunity to identify various beacons. The upper range of the aeronautical band 118.000 MHz to 136.975 MHz is where the majority of voice communications can be monitored. Communications in the VHF band are transmitted in AM mode and most if not all compatible receivers automatically default to this mode. Frequencies within the aeronautical range are spaced in increments of 25 kHz, as such you will find transmissions at 118.000, 118.025, 118.050 MHz etc.



The frequency(s) you monitor will determine the nature of traffic you will hear. As previously mentioned frequencies in the lower range of the aero-

nautical band are mostly occupied by navigational equipment and transmit non voice signals in Morse code. If you select a frequency in the upper range the air is suddenly filled with conversations between pilots and air traffic controllers, pilots and their company dispatchers, flight service stations, and ATIS broadcasts. Frequencies within the aeronautical band are designated according to their usage.

Refer to the page 23 for operation.

AIR (Aircraft) BAND FREQUENCY CHART	
Frequency Range	Communications Usage
108.000 - 117.975 MHz	Navigational Aids
118.000 - 121.400 MHz	Control Towers
121.500 MHz	Int'l Distress Frequency
121.600 - 122.900 MHz	Ground & Apron Control
122.700 - 123.900 MHz	UNICOM Frequencies
123.450 MHz	Air to Air / Pilot chit chat
124.000 - 128.800 MHz	Arrivals & Departures
128.825 - 132.000 MHz	Company Operations
132.000 - 135.975 MHz	Area Control Centre (Enroute)
136.000 - 136.975 MHz	Shared ATC/Company Ops & DataLink

MURS (MULTIPLE-USE RADIO SERVICE) Bands

MURS is a private short distance voice communication service for personal or business activities of the general public in the U.S. MURS channels can be received on this radio. The frequency and channel number is as follows.



MURS CHANNEL CHART	
1	151.820 MHz
2	151.880 MHz
3	151.940 MHz
4	154.570 MHz
5	154.600 MHz