

# Horizon Hand-Phone 6

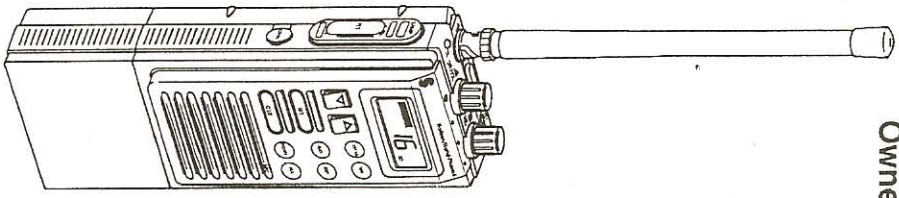
## HX220S

VHF/FM Marine  
Handheld Transceiver

Owner's Manual

**Contains:**

- General Information
- Operation
- Accessories
- Specifications
- Troubleshooting



Standard Communications Corp.  
P.O. Box 92151  
Los Angeles, CA 90009-2151  
Telephone 310/532-5300

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## 1

## GENERAL INFORMATION

### 1.1 INTRODUCTION

The Standard Communications Corp. (SCC) Model HX220S is a water-resistant marine handheld two-way VHF/FM radio. It can operate on all currently allocated USA and international VHF marine channels, including the 10 weather channels. Emergency channel 16 can be instantly accessed by pressing the CH16 key. Weather channels can be accessed immediately by pressing the WX key. Your SCC Dealer can set the radio to use Canadian channels instead of USA channels.

### 1.2 FCC/DOC INFORMATION

#### CAUTION

A Government-issued Station License and Call Sign are required before you can transmit with this radio.

The following data pertaining to the radio are necessary to fill out your FCC or DOC license application:

FCC Type Acceptance	Part 80
Output Power	
High Power	6.0 W
Low Power	1.0 W
Emission	16K0G3E
Frequency Range	156.025 to 163.275 MHz
FCC Type Acceptance Number	APV9T20486
DOC Type Approval Number	363 821 488V

**Additional FCC and DOC data, including licensing requirements, are contained in a companion document titled OWNERS MANUAL SUPPLEMENT. The document also contains charts for VHF channel assignments, radio procedures, maintenance, factory service information, and warranty data.**



## 2 CONTROLS AND INDICATORS

### 2.1 CONTROLS

This section defines each control of the radio. For detailed operating instructions refer to section 4 of this manual.

**POWER ON-OFF SWITCH/VOLUME CONTROL**  
Turns the radio on and off and controls the volume.

**SQUELCH CONTROL**  
Sets the point at which random noise on the channel does not activate the audio circuits but a normal signal does. This point is called the squelch threshold. Further adjustment of the squelch control beyond this point will degrade reception.

**TX/BUSY LED**  
Lights RED during transmission to indicate the presence of RF power.

**PTT SWITCH**  
Keys the transmitter.  
While held pressed, lights the LCD for night use.

**LAMP**  
Channel select. Each press selects the next higher channel. When held pressed, selects channels at a rate of 12 per second.

**CH16**  
Channel select. Each press selects the next lower channel. When held pressed, selects channels at a rate of 12 per second.

**U/I**  
Immediately switches to channel 16. Also used prior to pressing the U/I key to change channel nationality (USA/International).

**WX**  
Selects channel nationality (USA/International) after CH16 key is first pressed.

**SCAN**  
Immediately goes to first weather channel (WX01) from any channel.

**R/D**  
Initiates scanning of channels in scan memory.

**MEM**  
READS the selected channel into scan memory. MEM will appear on the LCD. When pressed again, will DELETE the memorized channel.

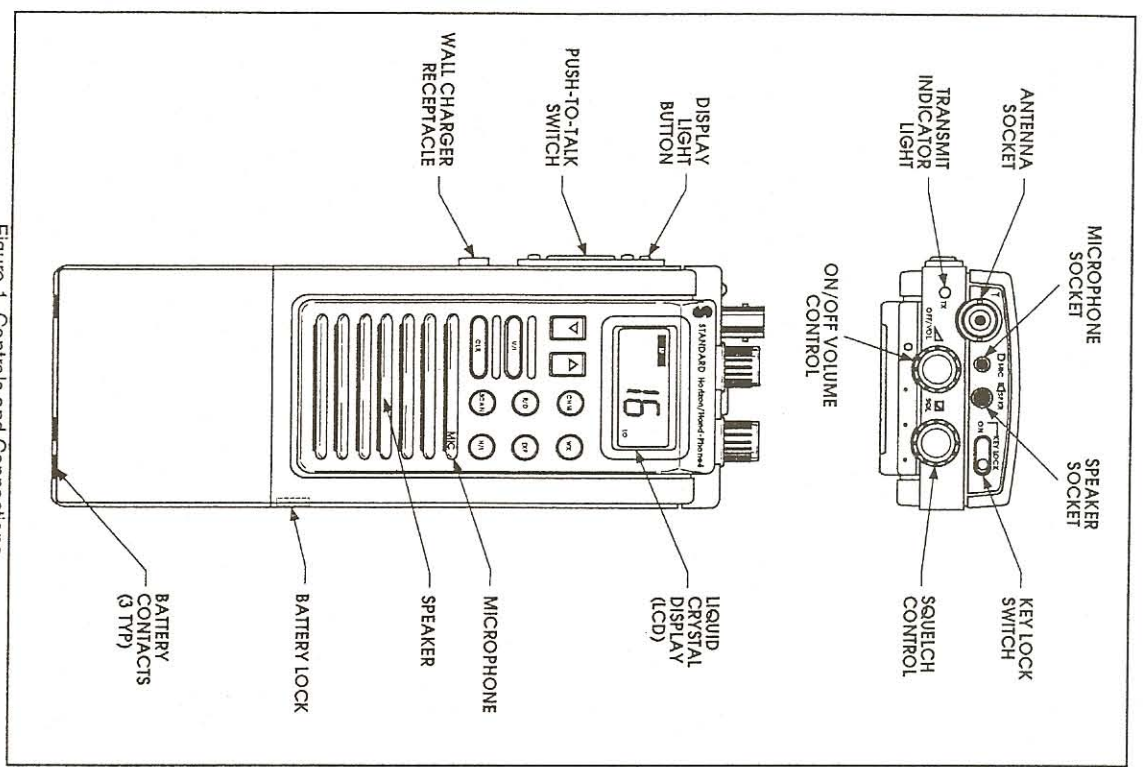


Figure 1. Controls and Connections

H/L

Toggles between high and low transmitting power. Certain channels are programmed for low power (1 watt) in accordance with usage regulations, and cannot be changed. See your *Owner's Manual Supplement* for details. An H or L appears on the LCD to indicate power setting. A channel for which an H or L does not appear is a receive-only channel on which the radio will not transmit.

CLR

Reverts to previous channel when pressed after the CH16 or WX key is pressed.  
Stops the radio from scanning when pressed during scan mode.

KEY LOCK

Erases all channels from the radio's scan memory when held pressed while turning the radio on.

CHG

A slide switch used to disable all 10 front-panel buttons except the H/L button.

BATTERY RELEASE

Connector for charging the battery pack with the wall charger supplied with the radio, or with the optional CMC20 charger that operates from a 12 VDC cigarette lighter. Do not operate the radio while using a charger.

EXTERNAL SPEAKER/MICROPHONE JACK

Releases the battery pack. To use, press and hold with one hand while twisting the battery pack with the other hand.

ANTENNA CONNECTOR

Accepts optional MP111 speaker/microphone or CHP111U speaker microphone/headset/PTT switch. When the SPKR jack is used, the internal speaker is disabled.

EXP

BNC connector for the supplied AT154 "rubber duck" antenna or the optional AT220 telescoping antenna.  
Accesses expansion channels.

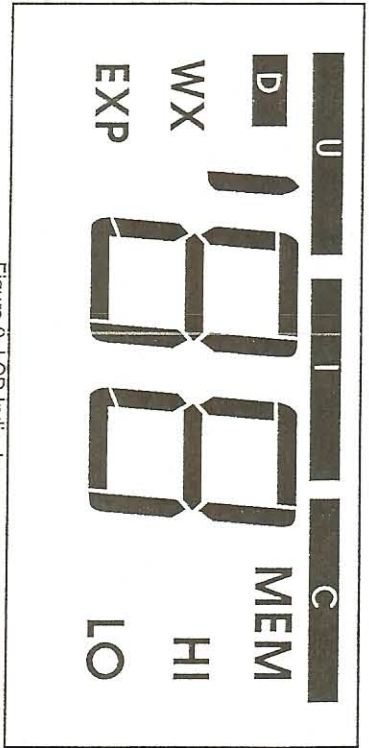


Figure 2. LCD Indicators

## 2.2 INDICATORS

Figure 2 shows all characters that can appear on the radio's LCD (Liquid Crystal Display). The following table describes each indication on the display.

<b>Channel Display</b>	Displays the operating channel in both transmit and receive mode. The small numeral "1" is used to indicate an expansion channel greater than EXP 99.
<b>D</b>	Indicates a duplex channel. See your <i>Owner's Manual Supplement</i> for a description of duplex and simplex channels.
<b>U/I/C</b>	Indicates channel nationality. "U" indicates USA, "I" indicates International, and "C" indicates Canada. The radio is programmed for USA and international operation. An SCC Dealer can set it for Canada and international operation by an internal modification.
<b>WX</b>	Indicates a weather channel.
<b>MEM</b>	Indicates that the channel is in the radio's scan memory. It is placed there or removed by the R/D key.
<b>HI/LO</b>	HI = High power. LO = Low power. Blank = a receive-only channel.
<b>EXP</b>	Indicates an expansion channel. These may be authorized at a future date by the FCC, but use prior to such authorization can result in a fine.



## 3 ACCESSORIES

### 3.1 Provided with Radio

- AT154 Rubber Duck VHF antenna with BNC connector
- CNB6 9.6 V, 525 mAh Rechargeable Battery Pack
- CWC25 Wall Charger for CNB6 and CNB7 Battery Packs

### 3.2 Optional Accessories

- AT220 Telescoping VHF antenna
- CNB7 9.6V 700mAh Rechargeable Battery Pack
- CMC20 12 VDC Battery Charger (for use with 12VDC Cigarette Lighters)
- CSA20 110/220 VAC Desktop Rapid Charger
- CSA220 110 VAC 6-Radio Rapid Gang Charger
- CMA200 12V Adapter for operating from ship's 12V system
- MP111 Speaker Microphone
- MP111U Speaker Microphone with Headset with PTT
- LCC27 Leather Carrying Case (brown) for radio with CNB6 Battery
- LCC29 Leather Carrying Case (brown) for radio with CNB7 Battery
- MCC20 Nylon Carrying Case (blue)
- WTH10 Waterproof Handheld Carrier
- CBH10 Swivel Belt Clip

## 4 OPERATION

### 4.1 INITIAL PROCEDURE

#### CAUTION

Never key the radio without an antenna connected; to do so may damage the radio. Also, do not operate the radio while it is being charged.

1. Install the antenna on the radio.
2. Turn the **POWER ON-OFF** switch clockwise to turn the radio on.

### 4.2 RECEPTION

1. Select the desired channel by pressing the **[M]** or **[V]** key.
2. Turn the **SQUELCH CONTROL** counterclockwise until noise is heard. Next, turn the control slightly clockwise just until the noise disappears. This is the proper squelch setting, and the control should not be rotated beyond this point or receiver sensitivity will be degraded.
3. When a message is received, adjust the volume to the desired listening level.

### 4.3 USA, CANADA, and INTERNATIONAL MODE

1. To change the radio's channel nationality, press the **CH16** key and then the **U/I** key. The nationality will change. For each change, the **CH16** key must be pressed first, and then the **U/I** key.

2. As shipped, the radio is set for USA operation. Performing step 1 above will alternate from USA, to International and indicate either a **U** or an **I** on the LCD.
3. If the radio is to be operated in Canada, an SCC Dealer can make the internal modification necessary for this use. Performing step 1 above will then alternate between Canadian and International and indicate either a **C** or an **I** on the LCD.
4. Most USA and Canadian channels are identical. Consult the channel charts in the **OWNER'S MANUAL SUPPLEMENT**.

### 4.4 WEATHER CHANNELS

1. To select a weather channel, press the **WX** key. The radio will go to the first weather channel, **WX01**.
2. Press the **[M]** or **[V]** key to change weather channels.
3. To exit from the weather channels, press the **CLR** key. The radio will revert to the previous non-weather channel.

### 4.5 SCANNING

Channels to be scanned must first be placed in scan memory as follows:

1. Select a channel to be scanned by using the **[M]** or **[V]** key. Press the **R/D** key to **READ** the channel into the radio's memory. **MEM** will appear on the LCD.
2. Repeat step 1 for other channels to be scanned.
3. To **DELETE** a channel from the radio's scan memory, press the **R/D** key again while the memorized channel is displayed. **MEM** will disappear from the LCD.
4. All channels placed in scan memory will remain in memory even if the power is turned off. An internal lithium battery maintains the memory.
5. Adjust the **SQUELCH CONTROL** until background noise just disappears.
6. To start scanning, press the **SCAN** key. Scanning will proceed from the lowest to the highest memorized channel and will stop on a channel receiving a signal, and the channel number will blink.
7. To stop scanning, press the **CLR** key.

### 4.6 CLEARING THE RADIO'S MEMORY

To erase all channels from memory:

1. Turn the radio off.
2. Press and hold the **CLR** key while turning the radio on.

### 4.7 TRANSMISSION

1. Monitor the channel on which you wish to transmit, prior to initiating transmission. **THIS IS AN FCC REQUIREMENT!**



2. For communications over short distances, press the H/L key until L is displayed on the LCD. This indicates low power, 1 watt. All channels will be set to low power.
3. If using low power is not effective, select high power by pressing the H/L key until H is displayed on the LCD. All channels except those permanently programmed low will be set to high power. Channels permanently programmed low for USA use are channels 13, 17, and 67.
4. When receiving a call, wait until the call is finished before transmitting. The radio cannot transmit and receive simultaneously.
5. Press the PTT (push-to-talk) switch to key the transmitter and initiate communications. For best results, speak into the microphone at a distance of 1/2 to 1 inch. The TX LED will light red during transmission.
6. Always release the PTT switch immediately after each transmission.

#### 4.8 EMERGENCY CHANNEL 16

The primary use of channel 16 is for emergencies that threaten life or property. A secondary use is for hailing another vessel, although channel 9 is now preferred for hailing. Your *Owner's Manual Supplement* gives a recommended procedure of how an emergency message should be broadcast. Study this procedure and memorize it. The following three simple steps describe how to quickly access and use channel 16 in an emergency:

1. Press the CH16 key.
2. Press the PTT switch and broadcast your emergency message.
3. If you cannot contact anyone on channel 16 after several attempts, switch to another channel.

#### 4.9 HAILING ANOTHER VESSEL

In the USA Channel 9 is the preferred channel for initial contact in areas where there is a large population of marine vessels. This leaves channel 16 free for emergency traffic. After initial contact, instruct the other station to go to another channel, which you should specify, leaving channel 9 free for hailing. If the station you are calling does not respond on channel 9, then try channel 16.

#### 4.10 SIMPLEX/DUPLEX CHANNEL USE

The channel charts in the *Owner's Manual Supplement* also indicate whether channels are simplex or duplex. Simplex channels carry the transmissions from both communicating parties on the same frequency. If you're listening on the channel, you can hear both conversations. Duplex channels use one frequency for transmitting and a different one for receiving; typical use is with marine telephone operators. You can't change the simplex/duplex mode of the channel you are on; it is set at the factory and a "D" will appear on the LCD for duplex channels.

#### 4.11 EXPANSION CHANNELS

When expansion channels are authorized by the FCC, up to 15 such channels may be programmed into the radio by an SCC Dealer as EXP01 through EXP15. If these channels have been programmed, press the EXP key on the front of the radio for access to the channels. Unauthorized use of expansion channels can result in penalties by the FCC.

#### 4.12 BATTERIES AND BATTERY CHARGING

The radio is supplied with a CNB6 battery pack. This pack consists of 8 nickel-cadmium batteries that supply the 10 VDC required for operation. The CNB7 is an optional heavy-duty battery pack that may be used in place of the CNB6. Refer to the Specifications Section for a comparison of their duty life.

Batteries are charged by using one of the following SCC chargers:

- CWC25 plug-in 110/220 VAC wall charger (supplied with the radio)
- CSA20 drop-in 110/220 VAC rapid charger (optional)
- CSA220 110 VAC 6-radio rapid gang charger (optional)
- CMC20 cigarette-lighter-type 12V trickle charger (optional)

The radio can be operated directly from the marine vessel's 12 VDC power by using the optional CMA200 12V adapter. This adapter converts the 12V to the 10V required by the radio.

#### CAUTION

On chargers with a 110/220 VAC switch, be sure that the switch is set to the correct line voltage before plugging it in. When using the CWC25 or CMC20, connect the charger to the radio before plugging the charger into the AC wall outlet.

To charge the radio's battery pack using the CWC25 charger supplied with the radio, or the CMC20 charger, leave the battery pack attached to the radio. First, check for the correct setting of the 110/220 VAC switch on the charger. Next, plug the charger into the radio, then plug the charger into the AC wall outlet.

If the optional CSA20 drop-in rapid charger or CSA220 gang charger is used, the battery pack can be charged while attached to the radio or may be removed from the radio and placed into the charger alone.

The radio has an internal lithium battery that maintains memory while the radio is off. Its failure will not affect radio operation while the radio is on, but scan memory will not be retained when the radio is turned off. This battery will normally last for years. It is soldered in place and should be replaced only by an SCC Dealer.

## 4.12.1 Battery Charging Times

CHARGER	BATTERY PACK	CHARGING TIME
CWC25	CNB6	12 to 14 Hours
	CNB7	18 to 20 Hours
	CNB6	50 Minutes
CSA20	CNB7	80 Minutes
	CNB6	2 to 3 Hours
CSA220	CNB7	3 to 4 Hours
	CNB6	12 to 14 Hours
CMC20	CNB6	12 to 14 Hours
	CNB7	18 to 20 Hours

## 4.13 BATTERY REMOVAL/INSTALLATION

To remove and reinstall the battery pack, perform the following:

1. Turn the radio off.
2. With your left hand, hold the radio facing you and press the battery lock switch.
3. With the other hand, twist the battery pack counter-clockwise. It will come loose from the radio after it is rotated.
4. To re-install a battery pack, make sure the radio is off. Then connect it to the radio, and, while pressing the battery lock switch, carefully twist the battery pack clockwise until it is aligned with the radio.

## 4.14 RESETTING THE MICROPROCESSOR

Sometimes it may be necessary to clear programmed expansion channels from memory or to reset the radio's microprocessor if it "locks up". One example of lockup would be meaningless characters on the display that persist even after turning the radio off and then on again. The easiest way to reset the microprocessor is to use the CLR key as described in 4.15.1 below. If this does not solve the problem, use the reset switch method described in 4.15.2.

### 4.14.1 Reset Using the CLR key

1. Turn the radio off.
2. Press and hold the CLR key:
3. Turn the radio on.
4. Release the CLR key.

### 4.14.2 Reset Using the Reset Switch

1. Remove the battery pack from the radio (see paragraph 4.14):
2. Position the radio upside down;
3. Lift the circular plastic tab marked RESET/EXP located in the bottom recess of the radio;
4. Press the black button that was covered by the tab;
5. Replace the tab and the battery.

The **OWNER'S MANUAL SUPPLEMENT** to this document contains FCC/DOC requirements and data, charts for VHF channel assignments, radio procedures, maintenance (including battery maintenance and charging), factory service information, and warranty data. Please be sure to read the supplement and keep it handy for reference.



# 5 SPECIFICATIONS

## 5.1 GENERAL

Frequency Range	156.025 to 163.275 MHz
Channels	All currently allocated USA, Canada, and International, plus 10 WX and 15 expansion
RF Power Output	6.0W (High) 1.0W (Low)
Operating Voltage	10 VDC
Current Drain	50 mA
Receive Standby	250 mA
Transmit	1.6 A (High) 0.7 A (Low)
Dimensions	16.1H x 6.0W x 3.4D (inches) 6.44H x 2.4W x 1.36D (mm)
Weight	1.32 lb. (0.6 kg)
FCC Compliance	Part 80
FCC Type Acceptance Number	APV9120486
DOC Type Approval Number	363 821 488V
Battery Life	
CNB6 (5% TX, 5% RX, 90% Standby)	4 hrs. 50 min. (Low)
(10% TX, 10% RX, 80% Standby)	3 hrs. 15 min. (High) 3 hrs. 20 min. (Low)
CNB7 (5% TX, 5% RX, 90% Standby)	2 hrs. 00 min. (High) 8 hrs. 10 min. (Low)
(10% TX, 10% RX, 80% Standby)	5 hrs. 30 min. (High) 5 hrs. 30 min. (Low)
CNB6 Battery Charge Time (with supplied CWC25 Charger)	3 hrs. 20 min. (High) 12 to 14 Hrs. (approx)
With optional CSA20 Charger	50 min. (approx)
With optional CMC20 Charger	2 to 3 Hrs. (approx) 12 to 14 Hrs. (approx)

## 5.2 TRANSMITTER

RF Power Out	6 Watts (High) 1 Watt (Low)
Modulation	16K0G3E
Spurious and Harmonic Emissions	60 dB (High) 45 dB (Low)

Audio Distortion	5%
Frequency Stability (-20° to +50° C)	± 0.0005%
Channel Spread	2.5 MHz

## 5.3 RECEIVER

Sensitivity	12 dB SINAD	0.30 µV max
20 dB Quieting		0.35 µV max
Threshold Squelch Sensitivity		0.15 µV
Modulation Acceptance Bandwidth		± 7.5 kHz
Selectivity		65 dB
Spurious Image Rejection		60 dB min
Intermodulation Rejection		60 dB min
Channel Spacing		25 kHz

# 6 TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
The SCAN key does not make the radio scan.	No channels placed into the radio's scan memory.  Squelch is not adjusted.	Use the F/D key to put desired channels into the radio's scan memory.  Adjust the squelch to threshold or to the point where noise just disappears. Further adjustment of the control will attenuate incoming signals.
Rotating the squelch control does not turn off background noise.	Low battery.	Charge battery. Refer to section 4.13 of this manual.
You can hear another station you but you cannot communicate with it and "D" is displayed on the LCD.	Operating on a duplex channel. Duplex channels are used to contact marine operators. The transmit and receive frequencies are different and will not allow ship-to-ship communications.	Use a simplex channel (no "D" displayed) when communicating ship-to-ship.
Cannot change channels	LOCK switch is on.	Set LOCK switch off.
Memorized channels are not retained in memory when the radio is turned off.	Defective lithium battery	Contact your SCC Dealer for servicing. Do not attempt to change this battery yourself.
LED on charger does not light when charging a battery.	Defective battery or charger.	Contact your SCC Dealer for servicing.