18.9   NMEA 0183 IN/OUT
18.9.1   Data Speed

This menu is used to setup the NMEA 0183 baud rate of the GPS input (Blue and Green wires) and DSC output (Gray and Brown wires). The default setting is 4800 bps.

When 38400 bps is selected the AIS sentences (VDM) and DSC sentences (DSC & DSE) both are output on the Gray and Brown wires after a DSC distress, position request or AIS transmission is received.

1.   [(**MENU**)] ➠ "**SETUP**" ➠ "**GPS SETUP**" ➠ "**NMEA 0183 IN/OUT**"

2.   Rotate the **DIAL/ENT** knob to select "**DATA SPEED**", then press the **[SELECT]** soft key.

3.   Rotate the **DIAL/ENT** knob to select the desired speed from "**4800bps**" and "**38400bps**".
4.   Press the **[ENTER]** soft key to save the new setting.
5.   Press the **CLEAR** key to return to radio operation.

18.9.2   Output Sentences

This selection is used to setup the NMEA output sentences of the **GX6000**.
By default, all the NMEA sentences are turned "ON".

1.   [(**MENU**)] ➠ "**SETUP**" ➠ "**GPS SETUP**" ➠ "**NMEA 0183 IN/OUT**"

2.   Rotate the **DIAL/ENT** knob to select "**OUTPUT SENTENCES**", then press the **[SELECT]** soft key.

3.   Rotate the **DIAL/ENT** knob to select the desired sentence type, then press the **[SELECT]** soft key.
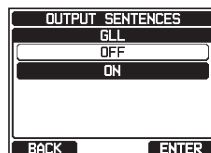
4. Rotate the **DIAL/ENT** knob to select "**ON**" or "**OFF**".
5. Press the **[ENTER]** soft key to save the new setting.
6. Repeat steps 3 through 5 to set the other sentences.
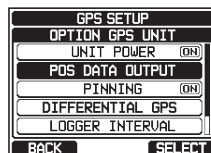7. Press the **CLEAR** key to return to radio operation.

NOTE

- Data output will be performed based on the data acquisition order of priority configured from "ORDER OF PRIORITY". Refer to section "**18.1 ORDER OF PRIORITY**" for details.
- While "UNIT POWER" of "OPTION GPS UNIT" is set to OFF, NMEA sentences will not be output. (OPTION GPS reception data will be output as is.)
- The output interval of each NMEA sentence depends on the output timing on the input device. However, sentences which include POS data will be output at intervals of two seconds or less.
- When all sentences are set to be output, depending on the baud rate, not all sentences can be output at intervals of one second or less. GSA and GSV sentences will be output at intervals of around five seconds.
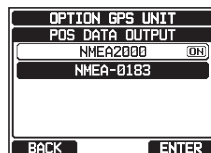
18.10 Position Data Output

Select the connection device to be used when outputting position data.

1. [**MENU**] ⇒ "**SETUP**" ⇒ "**GPS SETUP**" ⇒ "**OPTION GPS UNIT**"

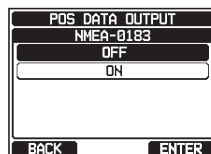2. Rotate the **DIAL/ENT** knob to select "**POS DATA OUTPUT**", then press the **[SELECT]** soft key.

3. Rotate the **DIAL/ENT** knob to select "**NMEA 2000**" or "**NMEA 0183**", then press the **[SELECT]** soft key.

4. Rotate the **DIAL/ENT** knob to select "**OFF**" or "**ON**".
5. Press the **[ENTER]** soft key to store the new setting.
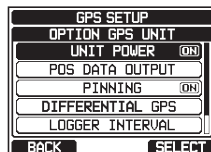6. Press the **CLEAR** key to return to radio operation.

18.11 OPTION GPS UNIT

Change the optional GPS Antenna (**SCU-31**) setting.

18.11.1 Unit Power

When you use the **SCU-31**, set this selection to "ON". The default setting is "OFF".

1. [(MENU)] ➠ "**SETUP**" ➠ "**GPS SETUP**" ➠ "**OPTION GPS UNIT**"

2. Rotate the **DIAL/ENT** knob to select "**UNIT POWER**", then press the **[SELECT]** soft key.

3. Rotate the **DIAL/ENT** knob to select "**OFF**" or "**ON**".
4. Press the **[ENTER]** soft key to store the new setting.
5. Press the **CLEAR** key to return to radio operation.
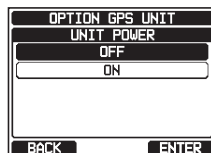
18.11.2 Pinning

This selection is used to enable or disable position updates when the vessel is not underway. The default setting is "ON".

1. [(MENU)] ➠ "**SETUP**" ➠ "**GPS SETUP**" ➠ "**OPTION GPS UNIT**"

2. Rotate the **DIAL/ENT** knob to select "**PINNING**", then press the **[SELECT]** soft key.

3. Rotate the **DIAL/ENT** knob to select "**OFF**" or "**ON**".
   ON: When pinning is turned on, the **GX6000** will not update its position unless the ship's speed over approximately 0.4 knot.
   OFF: When the vessel is underway or stopped, the **GX6000** continuously updates its position. This improves accuracy of the position fix.
4. Press the **[ENTER]** soft key to save the new setting.
5. Press the **CLEAR** key to return to radio operation.

18.11.3 Differential GPS

This selection enables or disables differential GPS function by SBAS (Satellite Based Augmentation System) such as WAAS, EGNOS and MSAS. In some areas (Australia for example), the GPS reception can have problems on enabling the SBAS. The default setting is "OFF".

1. [**MENU**] ➡ "**SETUP**" ➡ "**GPS SETUP**" ➡ "**OPTION GPS UNIT**"

2. Rotate the **DIAL/ENT** knob to select "**DIFFERENTIAL GPS**", then press the **[SELECT]** soft key.
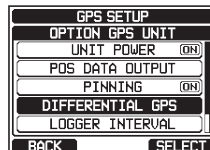
3. Rotate the **DIAL/ENT** knob to select "**OFF**" or "**ON**".
4. Press the **[ENTER]** soft key to store the new setting.
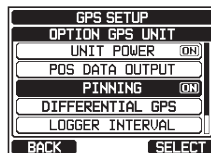5. Press the **CLEAR** key to return to radio operation.
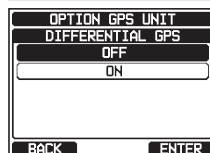
18.11.4 Logger Interval

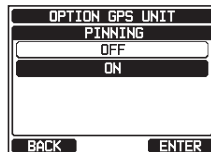1. [**MENU**] ➡ "**SETUP**" ➡ "**GPS SETUP**" ➡ "**OPTION GPS UNIT**"

2. Rotate the **DIAL/ENT** knob to select "**LOGGER INTERVAL**", then press the **[SELECT]** soft key.
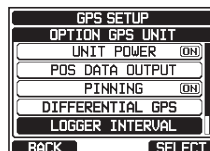
3. Rotate the **DIAL/ENT** knob to select the desired time and press the **[ENTER]** soft key.
    Note: Log time for each logger interval setting
    15 sec: Aprox. 25 hours
    30 sec: Aprox. 50 hours
    1 min: Aprox. 100 hours
    2 min: Aprox. 200 hours
    5 min: Aprox. 500 hours
4. Press the **CLEAR** key to return to radio operation.
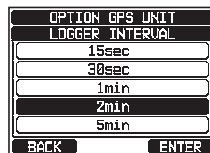
18.11.5 Log Erase

1. [MENU] ➠ "**SETUP**" ➠ "**GPS SETUP**" ➠ "**OPTION GPS UNIT**"

2. Rotate the **DIAL/ENT** knob to select "**LOG ERASE**", then press the **[SELECT]** soft key.

```
GPS SETUP
OPTION GPS UNIT
POS DATA OUTPUT
PINNING        ON
DIFFERENTIAL GPS
LOGGER INTERVAL
LOG ERASE
BACK          SELECT
```

3. Press the **[YES]** soft key. (To cancel, press the **[NO]** soft key.)

```
OPTION GPS UNIT
LOG ERASE

ERASING
Do you want to erase
a GPS LOG data?
YES           NO
```

4. Press the **[OK]** soft key.
5. Press the **CLEAR** key to return to radio operation.

```
OPTION GPS UNIT
LOG ERASE

ERASING
Completed
OK
```
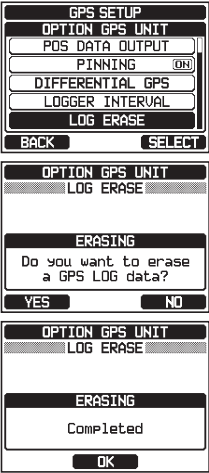
18.12 SUMMARY OF THE GPS SETUP

Item	Description	Default Value	Page
ORDER OF PRIORITY	Sets the order of priority of the connection devices when obtaining position information	NMEA-0183	122
COMPASS DIRECTION	Selects the compass direction to be displayed	COURSE-UP	122
LOCATION FORMAT	Selects the coordinate system to be displayed	ddd°mm.mmmm	122
TIME OFFSET	Sets the offset time from the UTC (available only when "LOCAL" is selected in the item "TIME AREA")	00:00	123
TIME AREA	Selects the time location to be displayed, from UTC or local	UTC	123
TIME FORMAT	Selects the time format to be displayed, 12-hour or 24-hour (fixed to "24H" when "UTC" is selected in the item "TIME AREA")	24hour	123
UNITS OF MEASURE	Selects the unit if measure when displaying speed, distance, and altitude	SPEED: kts (knots) DISTANCE: nm (nautical mile) ALTITUDE: ft (feet)	123
MAGNETIC VARIATION	Enables/disables the magnetic variation function	OFF	123
NMEA 0183 IN/OUT			
DATA SPEED	Sets the NMEA 0183 data speed	4800bps	124

Item	Description	Default Value	Page
OUTPUT SENTENCES	Enables/disables NMEA sentences	GLL: ON GGA: ON GSA: ON GSV: ON RMC: ON DSC/DSE: ON	124
POS DATA OUTPUT	Selects the connection device when outputting position data	NMEA 2000: OFF NMEA-0183: OFF	125
OPTION GPS UNIT			
UNIT POWER	Enables/disables the OPTION GPS UNIT	OFF	126
PINNING	Turns on or off GPS position updates for vessel not underway	OFF	126
DIFFERENTIAL GPS	Turns on or off of use of SBAS	ON	127
LOGGER INTERVAL	Selects the interval time of logging	2 min	127
LOG ERASE	Erases the log data	−	128

19 SSM-70H (RAM4) REMOTE MIC OPERATION

When a remote microphone is connected to the **GX6000**, all VHF, DSC, setup menus, AIS, Navigation, GM (Group Monitor) functions and PA/Fog modes can be remotely operated. The **SSM-70H**'s operation is same as **GX6000** except the receiver audio volume setting and squelch level setting. The reason for the same operation is to make the operation of the radio and **SSM-70H** mic easy. For specific operation of the **SSM-70H** mic review sections in the radio manual. The **SSM-70H** is supplied with 23 feet (7 m) of routing cable and can be extended up to 70 feet (21 m) using three 23 feet (7 m) extension cables model **CT-100**. The Intercom feature can be used between the **SSM-70H** and the **GX6000**. In addition, speaker wires are supplied at the panel mount of the routing cable for external speakers to be connected in noisy environments.

19.1 REMOTE MIC CONTROLS
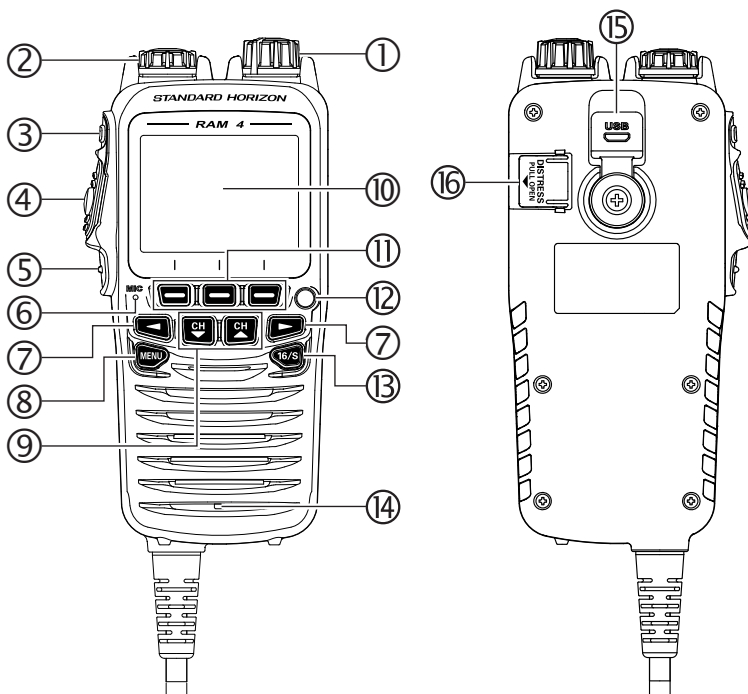
① **Power/VOL** knob
Press and hold this knob to turn the transceiver and the remote mic on or off. Rotate this knob to adjust the internal speaker volume.

② **DIAL/ENT** knob

While the normal screen is displayed, rotate the **DIAL/ENT** knob to select your desired channel. While the MENU screen is displayed, rotate the knob to select your desired menu item.

SECONDARY USE

Press this knob to enter a selection in the MENU.

③ **SQL** key (Squelch control)

Press this key to activate the squelch adjusting mode. Press the **CH▲** or **CH▼** key to adjust the squelch threshold level.

④ **PTT** (Push-To-Talk) switch

Push this switch to enable the transmitter.

⑤ **CLEAR/Oπ** key

Press this key to cancel a menu selection. Press and hold this key to activate the key lock function. Press and hold this key again to deactivate the key lock function.

⑥ Microphone

The internal microphone transmits your voice reducing background noise using Clear Voice Noise Reduction Technology.

Note: Position your mouth about 1/2" (1.5 cm) away from the microphone hole and speak in a normal voice.

⑦ ◄/► key

Press these keys to switch the function of soft keys

SECONDARY USE

While the MENU screen is displayed, press the key to slide the on-screen menu to the right/left side.

⑧ **MENU** key

Press this key to access the MENU.

⑨ **CH▼/CH▲** key

These keys are used to change the operating channel.

Press the key momentarily, the channel increases/decreases one step. Holding the key, the channel increases/decreases continuously.

SECONDARY USE

• While the MENU screen is displayed, press the key to slide the on-screen menu upward/downward.
• When in the PA or Fog mode, press the key to change the channel.

⑩ Display

Full dot matrix display, 222 by 162 pixels.

⑪ Soft keys

These three programmable keys can be customized through the setup menu mode. When pressing one of these keys briefly, the key functions will appear at the bottom of the display. Refer to section "**19.2 RAM4 SOFT KEY ASSIGNMENT**" for details.

⑫ Strobe Light

When the **[STROBE]** soft key is pressed, the internationally-recognized

Morse Code "S.O.S" message will light and flash repeatedly.
From MENU → SETUP → CONFIGURATION → STROBE LED, you can select one option from "CONTINUOUS", "SOS", "BLINK 1", "BLINK 2" and "BLINK 3".

⑬ **16/S** key
Pressing this key immediately recalls channel 16 from any channel location. Holding down this key recalls the SUB channel (The default setting is channel 9). Pressing this key again reverts to the previous selected working channel.

⑭ Speaker
The internal speaker is located here.

⑮ **DATA** jack
Use the micro USB type B jack for **SSM-70H** (**RAM4**) firmware updates.
Note: When the DATA jack is securely covered with rubber cap, the SSM-70H meets the waterproofing performance.

⑯ **DISTRESS** key
This key is used to send a DSC distress call. Refer to section "**10 DIGITAL SELECTIVE CALLING (DSC)**".

19.2   RAM4 SOFT KEY ASSIGNMENT

From this menu, you can assign desired functions to each **RAM4** soft key from numbers 01 to 12. You can also set how long the soft key icon will be displayed after the corresponding soft key is pressed. The keys maybe setup to control the following functions:

DISPLAY	FUNCTION	SOFT KEY NUMBERS ASSIGNED AS DEFAULT (See the next page.)
NONE	–	–
TX HI/LO	Selects transmit power.	02
WX/CH	Switches channels between weather and marine.	01
SCAN	Turns on or off scanning function.	05
DUAL WATCH	Starts and stops dual watch scan.	06
MARK POSITION	Marks the current position for a "Waypoint".	09
SCAN MEMORY	Add or remove channels from memory channel scan.	04
PRESET	Programs or deletes the preset memory channel.	10
MAN OVER BOARD	Marks the position where a person falls overboard.	03
NOISE CANCEL	Enables the noise canceling settings display.	
CH NAME	Edit channel names.	
STROBE	Turns on or off the strobe light LED.	
SCRAMBLER	Configures the secret communication settings.	
COMPASS	Enables the "Compass" display.	
WAYPOINT	Enables the "Waypoint" or "Route" navigation display.	
FOG HORN	Select FOG HORN mode.	
INTERCOM	Activates intercom between radio and RAM4 mic (optional RAM4 required).	
GPS LOGGER	Starts and stops logging position data.	
AIS DISPLAY	Shows the "AIS" display.	
HORN BUTTON	Activates the Fog Horn function.	12
PUBLIC ADDRESS	Activates the PA function.	
RX RECORD	Records received voices.	07
RX SENSE	Toggles between LOCAL and DISTANCE.	11

DISPLAY	FUNCTION	SOFT KEY NUMBERS ASSIGNED AS DEFAULT (See the next page.)
PLAY	Plays recorded voices.	08

NOTE

You can assign functions to soft keys on each of the transceiver and the optional **SSM-70H** (**RAM4**) remote mic.

19.2.1   Key Assignment

Configure all settings on the **SSM-70H** (**RAM4**) remote mic for which you want to assign functions to soft keys.

1. [**MENU**] ➠ "**SETUP**" ➠ "**CONFIGURATION**" ➠ "**SOFT KEY**"

2. Rotate the **DIAL/ENT** knob to select "**KEY ASSIGN-MENT**", then press the **[SELECT]** soft key.
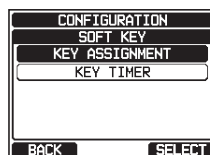
3. Rotate the **DIAL/ENT** knob to select the key number to be programmed, and press the **[SELECT]** soft key.
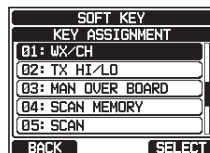
4. Rotate the **DIAL/ENT** knob to select a new function to be assigned, and press the **[ENTER]** soft key. Available functions are listed below. By selecting "**NONE**" the soft key assignment is removed.
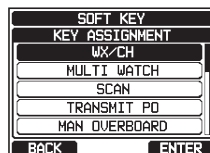
5. Repeat steps 3 and 4 to program other soft keys. Up to 24 functions can be assigned.
    The VHF radio's functions can be assigned to the maximum of 12 soft keys. Pressing the ►/◄ key each time shows three different soft keys.

(The illustration above is the default setting.)

6. Press the **CLEAR/O‑** key to return to radio operation.

20 CONNECTING A USB DATA TERMINAL TO THE PC

The GX6000 settings can be programmed using the USB terminal and PC Programming Software. You can also download the log data from the radio by using the PC Programming Software which may be downloaded from the Standard Horizon website. The PC Programming Software is compatible with Windows®.

To connect a PC, use the supplied USB cable through the **DATA** jack of the **GX6000**.

DATA jack

supplied USB cable
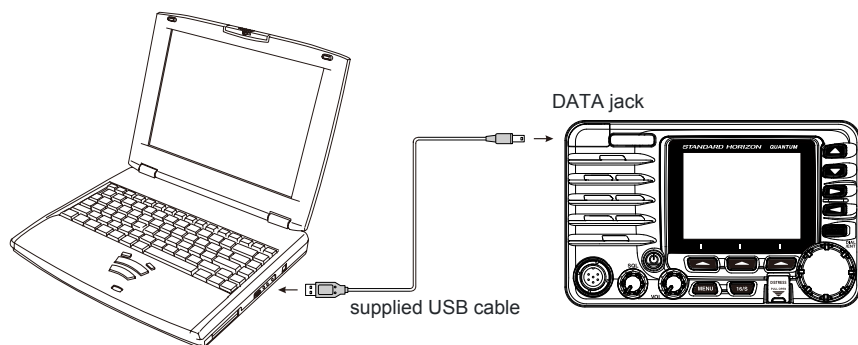
CAUTION

The **DATA** jack is NOT designed to be waterproof when the cover is opened. Connect the radio and PC in a dry location.

If you have further questions, please feel free to contact Product Support at:
Phone: (800) 767-2450
Email: marinetech@yaesu.com

21 MAINTENANCE

The inherent quality of the solid-state components used in this transceiver will provide many years of continuous use. Taking the following precautions will prevent damage to the transceiver.

- Never key the microphone unless an antenna or suitable dummy load is connected to the transceiver.
- Ensure that the supply voltage to the transceiver does not exceed 16 VDC or fall below 11 VDC.
- Use only STANDARD HORIZON approved accessories and replacement parts.

In the unlikely event of serious problems, please contact your Dealer or our repair facility. Address and phone numbers for this facility, as well as warranty information, are contained in section "**23 WARRANTY**".

21.1 REPLACEMENT PARTS

Occasionally an owner needs a replacement mounting bracket or knob. These can be ordered from our Parts Department by emailing yaesuparts@yaesu.com or calling:

Marine Division of YAESU U.S.A.

6125 Phyllis Drive, Cypress, California 90630

Telephone (714) 827-7600

Commonly requested parts, and their part numbers are listed below.

- **Power Cord**: T9027407
- **VOL and SQL Knob**: RA6057800
- **DIAL/ENT Knob**: RA6057700
- **Mounting Bracket**: RA6060600
- **Mounting Bracket Knob**: RA0978600
- **Microphone Hanger**: RA0458800
- **RAM4 Mic Routing Cable Assembly**: S8101512
- **USB Cable**: T9101648

21.2 FACTORY SERVICE

In the unlikely event that the radio fails to perform or needs servicing, please contact the following:

Standard Horizon

Attention Marine Repair Department

6125 Phyllis Drive, Cypress, California 90630, U.S.A.

Telephone (800) 366-4566

For repairs in Canada

Westcom Marine

488 East 62nd Avenue Vancouver BC V5X2G1

Telephone (604) 327-6280

An "RA" (Return Authorization) number is not necessary to send a product in for service. Include a brief note describing the problem along with your name, return address, phone number, and proof of purchase.

21.3 TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	REMEDY
Transceiver fails to power up.	No DC voltage to the transceiver, or blown fuse.	a. Check the 12VDC battery connections and the fuse. b. The ⏻ key needs to be pressed and held to turn the radio on.
Transceiver blows fuse when connected to power supply.	Reversed power wires.	Check the power cable for DC voltage, or replace the fuse (7A). Make sure the red wire is connected to the positive (+) battery post, and the black wire is connected to the negative (–) battery post. If the fuse still blows, contact your Dealer.
Popping or whining noise from the speaker while engine runs.	Engine noise.	Re-route the DC power cables away from the engine. Add noise suppressor on power cable. Change to resistive spark plug wires and/or add an alternator whine filter.
Sound is not emitted from the internal or external speaker.	Accessory cable.	Check the connections of the accessory cable. External speaker cable (WHITE/SHIELD) shorted together.
Sound is not emitted from the PA speaker.	Accessory cable.	Check the connections of the accessory cable. PA speaker cable (RED/SHIELD) shorted together.
Receiving station reports low transmit power, even with transceiver set to HI power.	Antenna.	Have the antenna checked or test the transceiver with another antenna. If the problem persists, contact your Dealer for servicing.
"HI BATTERY" or "LO BATTERY" message appears when the power is turned on.	The power supply voltage is too high or too low.	Confirm that the connected power supply voltage is between 11 volts and 16.5 volts DC.
Your position is not displayed.	**SCU-31** cable.	Check the **SCU-31** cable connection.
	Accessory cable.	Check the accessory cable connection. Some GPS use the battery ground for NMEA connection.
	Setting of the GPS chart plotter.	Check the output signal format of the GPS navigation receiver. This radio requires NMEA 0183 and NMEA 2000 format with GLL, RMB, or RMC sentence as an output signal. If the GPS has a baud rate setting make sure to select 4800 and parity to NONE.

22 CHANNEL ASSIGNMENTS

Tables on the following columns list the VHF Marine Channel assignments for U.S.A. and International use. Below are listed some data about the charts.

1. VTS. Where indicated, these channels are part of the U.S. Coast Guard's Vessel Traffic System.

2. Alpha channel numbers, that is, channel numbers followed by the letter A (such as Channel 07**A**) are *simplex* channels on the U.S.A. or Canadian channel assignments whose counterparts in the International assignments are *duplex* channels. International channels do not use "alpha" numbers. If you call the Coast Guard on Channel 16, they will sometimes ask you to "*go to channel 22 Alpha*". This is a channel assigned to U.S.A, and Canadian Coast Guards for handling distress and other calls. If your radio is set for *International* operation you will go to Channel 22 instead of 22**A**, and will not be able to communicate with the Coast Guard. To use Channel 22**A**, your radio must be set for *USA* or *Canada* operation, usually by a U/I/C (USA/International/Canada) control or combination of controls. Channel 22 (without an "A") is an *International* duplex channel for port operations. Some radios indicate an "A" adjacent to the alpha channels on the display; on others "alpha" is not indicated but the proper channel is selected based on the U/I/C setting.

3. Bridge-to-Bridge channels (for example, Channel 13) are for use by bridge operators on inter-coastal waterways and rivers. It is also used by marine vessels in the vicinity of these bridges for navigation and for communicating with the bridge operators. Note that a limit of 1 Watt is specified for these channels.

4. The **S/D** column on the chart indicates either S (simplex) or D (duplex). *Simplex* means transmitting and receiving on the same frequency. Only one party at a time can talk, unlike a telephone. Be sure to say "*over*" and release your microphone push-to-talk switch at the end of each transmission. *Duplex* operation involves the use of one frequency for transmitting and a separate frequency for receiving. On channels specified as duplex on the charts, correct mode of operation is established automatically by your radio when you select a channel; you cannot change the mode. And you still must release the push-to-talk switch after each transmission in order to listen to the radio.

5. Channels normally used by recreational boaters are those that include the term "non-commercial" in the *Channel Use* column of the chart. Some of these are shared with other users and some are used only in certain geographic regions.

6. Marine vessels equipped with VHF radios are required to monitor Channel 16.

7. 156.050 MHz and 156.175 MHz are available for port operations and commercial communications purposes when used only within the U.S. Coast Guard designated Vessel Traffic Services (VTS) area of New Orleans, on the lower Mississippi River from the various pass entrances in the Gulf of Mexico to Devil's Swamp Light at River Mile 242.4 above head of passes near Baton Rouge.

8. 156.250 MHz is available for port operations communications use only within the U.S. Coast Guard designated VTS radio protection areas of New Orleans and Houston described in Sec. 80.383. 156.250 MHz is available for intership port operations communications used only within the area of Los Angeles and Long Beach harbors, within a 25- nautical mile radius of Point Fermin, California.

9. 156.550 MHz, 156.600 MHz and 156.700 MHz are available in the U.S. Coast Guard designated port areas only for VTS communications and in the Great Lakes available primarily for communications relating to the movement of ships in sectors designated by the St. Lawrence Seaway Development Corporation or the U.S. Coast Guard. The use of these frequencies outside VTS and ship movement sector protected areas is permitted provided they cause no interference to VTS and ship movement communications in their respective designated sectors.

10. Use of 156.875 MHz is limited to communications with pilots regarding the movement and docking of ships. Normal output power must not exceed 1 watt. 5: 156.375 MHz and 156.650 MHz are available primarily for intership navigational communications. These frequencies are available between coast and ship on a secondary basis when used on or in the vicinity of locks or drawbridges. Normal output power must not exceed 1 watt. Maximum output power must not exceed 10 watts for coast stations or 25 watts for ship stations.

11. On the Great Lakes, in addition to bridge-to-bridge communications, 156.650 MHz is available for vessel control purposes in established vessel traffic systems. 156.650 MHz is not available for use in the Mississippi River from South Pass Lighted Whistle Buoy "2" and Southwest Pass entrance Mid-channel Lighted Whistle Buoy to mile 242.4 above Head of Passes near Baton Rouge. Additionally, it is not available for use in the Mississippi River-Gulf Outlet, the Mississippi River-Gulf Outlet Canal, and the Inner Harbor Navigational Canal, except to aid the transition from these areas.

12. Use of 156.375 MHz is available for navigational communications only in the Mississippi River from South Pass Lighted Whistle Buoy "2" and South-

west Pass entrance Mid channel Lighted Whistle Buoy to mile 242.4 above head of Passes near Baton Rouge, and in addition over the full length of the Mississippi River-Gulf Outlet Canal from entrance to its junction with the Inner Harbor Navigation Canal, and over the full length of the Inner Harbor Navigation Canal from its junction with the Mississippi River to its entry to Lake Pontchartrain at the New Seabrook vehicular bridge.

13. Within 120 km (75 miles) of the United States/Canada border, in the area of the Puget Sound and the Strait of Juan de Fuca and its approaches, 157.425 MHz is half of the duplex pair designated as Channel 88. In this area, Channel 88 is available to ship stations for communications with public coast stations only. More than 120 km (75 miles) from the United States/Canada border in the area of the Puget Sound and the Strait of Juan de Fuca, its approaches, the Great Lakes, and the St. Lawrence Seaway, 157.425 MHz is available for intership and commercial communications. Outside Puget Sound area and its approaches and the Great Lakes, 157.425 MHz is also available for communications between commercial fishing vessels and associated aircraft while engaged in commercial fishing activities.

14. When the frequency 156.850 MHz is authorized, it may be used additionally for search and rescue training exercises conducted by state or local governments.

15. The frequency 156.850 MHz is additionally available to coast stations on the Great Lakes for transmission of scheduled Coded Marine Weather Forecasts (MAFOR), Great Lakes Weather Broadcast (LAWEB) and scheduled Notices to Mariners or Bulletins. F3C and J3C emissions are permitted. Coast Stations on the Great Lakes must cease weather broadcasts which cause interference to stations operating on 156.800 MHz until the interference problem is resolved.

16. The frequency 157.100 MHz is authorized for search and rescue training exercises by state or local government in conjunction with U.S. Coast Guard stations. Prior U.S. Coast Guard approval is required. Use must cease immediately on U.S. Coast Guard request.

17. The duplex pair for channel 20 (157.000/161.600 MHz) may be used for ship to coast station communications.

18. Available for assignment to coast stations, the use of which is in accord with an agreed program, for the broadcast of information to ship stations concerning the environment.

VHF MARINE CHANNEL CHART						
CH	U	C	I	S/D	TX	RX	CHANNEL USE
01		X	X	D	156.050	160.650	Public Correspondence (Marine Operator)
01A	X			S	156.050		Port Operation and Commercial. VTS in selected areas
02		X	X	D	156.100	160.700	Public Correspondence (Marine Operator)
03		X	X	D	156.150	160.750	Public Correspondence (Marine Operator)
03A	**X**			**S**	**156.150**		**U.S. Government Only, Coast Guard**
04			X	D	156.200	160.800	Public Correspondence (Marine Operator), Port operation, ship movement
04A		X		S	156.200		Pacific coast: Coast Guard, East Coast: Commercial fishing
05			X	D	156.250	160.850	Public Correspondence (Marine Operator), Port operation, ship movement
05A	X	X		S	156.250		Port operation. VTS in Seattle
06	X	X	X	S	156.300		Inter-ship Safety
07			X	D	156.350	160.950	Public Correspondence (Marine Operator), Port operation, ship movement
07A	X	X		S	156.350		Commercial
08	X	X	X	S	156.400		Commercial (Inter-ship only)
09	X	X	X	S	156.450		Boater Calling channel, Commercial & Non-commercial (Recreational)
10	X	X	X	S	156.500		Commercial
11	X	X	X	S	156.550		Commercial. VTS in selected areas.
12	X	X	X	S	156.600		Port operation. VTS in selected areas.
13	X	X	X	S	156.650		Inter-ship Navigation Safety (Bridge-to-bridge)
14	X	X	X	S	156.700		Port operation. VTS in selected areas.
15	X			S	- - -	156.750	Environmental (Receive only)
15		X	X	S	156.750		Commercial, non-commercial, ship movement (1 W)
16	X	X	X	S	156.800		International Distress, Safety and Calling
17	X	X	X	S	156.850		State Controlled (1 W)
18			X	D	156.900	161.500	Port operation, ship movement
18A	X	X		S	156.900		Commercial
19			X	D	156.950	161.550	Port operation, ship movement
1019			X	S	156.950		
2019			X	S	161.550		
19A	X			S	156.950		US: Commercial
19A		X		S	156.950		Coast Guard
20	X	X	X	D	157.000	161.600	Canadian Coast Guard Only, International: port operations and shipment
1020			X	S	157.000		
2020			X	S	161.600		
20A	X			S	157.000		Port operation
21			X	D	157.050	161.650	Port operation, ship movement
21A	**X**	**X**		**S**	**157.050**		**U.S. Government Only, Canadian Coast Guard**
21B		X			- - -	161.650	CMB Service
22			X	D	157.100	161.700	Port operation, ship movement
22A	X	X		S	157.100		US and Canadian Coast Guard Liaison and Maritime Safety Information Broadcasts announced on channel 16
23		X	X	D	157.150	161.750	Public Correspondence (Marine Operator)
23A	**X**			**S**	**157.150**		**U.S. Government Only**

							VHF MARINE CHANNEL CHART

CH	U	C	I	S/D	TX	RX	CHANNEL USE
23B		X			- - -	161.750	CMB Service
24	X	X	X	D	157.200	161.800	Public Correspondence (Marine Operator)
25	X	X	X	D	157.250	161.850	Public Correspondence (Marine Operator)
25B		X			- - -	161.850	CMB Service
26	X	X	X	D	157.300	161.900	Public Correspondence (Marine Operator)
27	X	X	X	D	157.350	161.950	Public Correspondence (Marine Operator)
28	X	X	X	D	157.400	162.000	Public Correspondence (Marine Operator)
28B		X			- - -	162.000	CMB Service
60		X	X	D	156.025	160.625	Public Correspondence (Marine Operator)
61			X	D	156.075	160.675	Public Correspondence (Marine Operator), Port operation, ship movement
61A	**X**	**X**		**S**	**156.075**		**Public Coast: Coast Guard; East Coast: commercial fishing only**
62			X	D	156.125	160.725	Public Correspondence (Marine Operator), Port operation, ship movement
62A		X		S	156.125		Public Coast: Coast Guard; East Coast: commercial fishing only
63			X	D	156.175	160.775	Public Correspondence (Marine Operator), Port operation, ship movement
63A	X	X		S	156.175		Port Operation and Commercial. VTS in selected areas.
64		X	X	D	156.225	160.825	Public Correspondence (Marine Operator), Port operation, ship movement
64A	**X**	**X**		**S**	**156.225**		**Public Correspondence (Marine Operator), Port operation, ship movement**
65			X	D	156.275	160.875	Public Correspondence (Marine Operator), Port operation, ship movement
65A	X	X		S	156.275		Port Operations
66			X	D	156.325	160.925	Public Correspondence (Marine Operator), Port operation, ship movement
66A	X	X		S	156.325		Port Operations
67	X	X	X	S	156.375		US: Commercial. Used for Bridge-to-bridge communications in lower Mississippi River. Inter-ship only. Canada: Commercial fishing, S&R
68	X	X	X	S	156.425		Non-commercial (Recreational)
69	X	X	X	S	156.475		US: Non-commercial (Recreational), Canada: Commercial fishing, International: Inter-ship, Port operations and Ship movement
70	X	X	X	S	- - -	156.525	Digital selective calling (voice communications not allowed)
71	X	X	X	S	156.575		US, Canada: Non-commercial (Recreational), International: Port operations and Ship movement
72	X	X	X	S	156.625		Non-commercial (Inter-ship only)
73	X	X	X	S	156.675		US: Port Operations, Canada: Commercial fishing only, International: Inter-ship, Port operations and Ship movement

CH	U	C	I	S/D	TX	RX	CHANNEL USE
74	X	X	X	S	156.725		US: Port Operations, Canada: Commercial fishing only, International: Inter-ship, Port operations and Ship movement
75	X	X	X	S	156.775		Port Operations (Inter-ship only) (1W)
76	X	X	X	S	156.825		Port Operations (Inter-ship only) (1W)
77	X	X		S	156.875		Port Operations (Inter-ship only) (1W)
77			X	S	156.875		Port Operations (Inter-ship only)
78			X	D	156.925	161.525	Public Correspondence (Marine Operator), Port operation, ship-movement
1078			X	S	156.925		
2078			X	S	161.525		
78A	X	X		S	156.925		Non-commercial (Recreational)
79			X	D	156.975	161.575	Port operation and Ship movement
1079			X	S	156.975		
2079			X	S	161.575		
79A	X	X		S	156.975		Commercial
80			X	D	157.025	161.625	Port operation, ship movement
80A	X	X		S	157.025		Commercial
81			X	D	157.075	161.675	Port operation, ship movement
81A	**X**			**S**	**157.075**		**U.S. Government Only - Environmental protection operations.**
81A		X		S	157.075		Canadian Coast Guard Only
82			X	D	157.125	161.725	Public Correspondence (Marine Operator), Port operation, ship movement
82A	**X**	**X**		**S**	**157.125**		**U.S. Government Only, Canadian Coast Guard Only**
83			X	D	157.175	161.775	Public Correspondence (Marine Operator)
83A	**X**	**X**		**S**	**157.175**		**U.S. Government Only, Canadian Coast Guard Only**
83B		X			- - -	161.775	CMB Service
84	X	X	X	D	157.225	161.825	Public Correspondence (Marine Operator)
85	X	X	X	D	157.275	161.875	Public Correspondence (Marine Operator)
86	X	X	X	D	157.325	161.925	Public Correspondence (Marine Operator)
87		X	X	S	157.375		Port operation, ship movement
87A	X			S	157.375		Public Correspondence (Marine Operator)
88		X	X	S	157.425		Port operation, ship movement
88A	X			S	157.425		Commercial, Inter-ship Only
WX01	X	X	X	D	- - -	162.550	Weather (receive only)
WX02	X	X	X	D	- - -	162.400	Weather (receive only)
WX03	X	X	X	D	- - -	162.475	Weather (receive only)
WX04	X	X	X	D	- - -	162.425	Weather (receive only)
WX05	X	X	X	D	- - -	162.450	Weather (receive only)
WX06	X	X	X	D	- - -	162.500	Weather (receive only)
WX07	X	X	X	D	- - -	162.525	Weather (receive only)
WX08	X	X	X	D	- - -	161.650	Weather (receive only)
WX09	X	X	X	D	- - -	161.775	Weather (receive only)
WX10	X	X	X	D	- - -	163.275	Weather (receive only)

NOTE: Simplex channels, 03A, 21A, 23A, 61A, 64A, 81A, 82A and 83A CANNOT be lawfully used by the general public in U.S.A. waters.

23 WARRANTY

Marine Products Limited Warranty

PLEASE NOTE

The following "**Limited Warranty**" **is for valid for products that have been purchased in the United States and Canada. For limited Warranty details outside the United States, contact the dealer in your country.**

STANDARD HORIZON (a division of YAESU U.S.A.) warrants, to the original purchaser only, each new Marine Communications Product ("Product") manufactured and/or supplied by STANDARD HORIZON against defects in materials and workmanship under normal use and service for a period of time from the date of purchase as follows:

Fixed Mount and Portable Transceivers
   1 year - if purchased before 01/01/91
   3 years - if purchased between 01/01/91 and 01/01/94
   3 years Waterproof - if purchased after 01/01/94
Loud hailers
   1 year - if purchased before 01/01/91
   3 years - if purchased after 01/01/91
Associated Chargers
   1 year - if purchased before 01/01/91
   3 years - if purchased after 01/01/91

Associated Batteries - 1 year. Note: Batteries will be deemed deflective only if storage capacity drops below 80% of rated capacity or if leakage develops.

Associated Accessories - 1 year. Includes: Microphones/Handsets, External Speakers, Antennas, Carrying Accessories, Power Supplies, and Signaling Boards.

To receive warranty service, the purchaser must deliver the Product, transportation and insurance prepaid, to STANDARD HORIZON, Attention Marine repairs 6125 Phyllis Drive, Cypress, California 90630, U.S.A. Include proof of purchase indicating model. serial number, and date of purchase. STANDARD HORIZON will return the Product to the purchaser freight prepaid. Products purchased prior to January 1, 1991 will bear the STANDARD HORIZON warranty terms in effect prior to that date.

In the event of a defect, malfunction or failure of the Product during the warranty period, STANDARD HORIZON's liability for any breach of contract or any breach of express or implied warranties in connection with the sale of Products shall be limited solely to repair or replacement, at its option, of the Product or

part(s) therein which, upon examination by STANDARD HORIZON, appear to be defective or not up to factory specifications. STANDARD HORIZON may, at its option, repair or replace parts or subassemblies with new or reconditioned parts and subassemblies. Parts thus repaired or replaced are warranted for the balance of the original applicable warranty.

STANDARD HORIZON will not warrant installation, maintenance or service of the Products. In all instances, STANDARD HORIZON's liability for damages shall not exceed the purchase price of the defective Product.

This warranty only extends to Products sold within the 50 States of the United States of America and the District of Columbia.

STANDARD HORIZON will pay all labor to repair the product and replacement parts charges incurred in providing the warranty service except where purchaser abuse or other qualifying exceptions exist. The purchaser must pay any transportation expenses incurred in returning the Product to STANDARD HORIZON for service.

This limited warranty does not extend to any Product which has been subjected to misuse, neglect, accident, incorrect wiring by anyone other than STANDARD HORIZON, improper installation, or subjected to use in violation of instructions furnished by STANDARD HORIZON, nor does this warranty extend to Products on which the serial number has been removed, defaced, or changed. STANDARD HORIZON cannot be responsible in any way for ancillary equipment not furnished by STANDARD HORIZON which is attached to or used in connection with STANDARD HORIZON's Products, or for the operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. STANDARD HORIZON disclaims liability for range, coverage, or operation of the Product and ancillary equipment as a whole under this warranty. STANDARD HORIZON reserves the right to make changes or improvements in Products, during subsequent production, without incurring the obligation to install such changes or improvements on previously manufactured Products.

The implied warranties which the law imposes on the sale of this Product are expressly LIMITED, in duration, to the time period specified above. STANDARD HORIZON shall not be liable under any circumstances for consequential damages resulting from the use and operation of this Product, or from the breach of this LIMITED WARRANTY, any implied warranties, or any contract with STANDARD HORIZON. IN CONNECTION WITH THE SALE OF ITS PRODUCTS, STANDARD HORIZON MAKES NO WARRANTIES, EXPRESS OR IMPLIED AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, EXCEPT AS EXPRESSLY SET FORTH HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply. This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

ONLY PRODUCTS SOLD ON OR AFTER JANUARY 1, 1991 ARE COVERED UNDER THE TERMS OF THIS LIMITED WARRANTY.

ON-LINE WARRANTY REGISTRATION

THANK YOU for buying STANDARD HORIZON (a division of YAESU U.S.A.) products! We are confident your new radio will serve your needs for many years!

Please visit **www.standardhorizon.com** to register your Marine VHF. It should be noted that visiting the website from time to time may be beneficial to you, as new products are released they will appear on the STANDARD HORIZON website. Also a statement regarding product support should be added to the manual.

Product Support Inquiries

If you have any questions or comments regarding the use of the radio, you can visit the STANDARD HORIZON website to send an E-Mail or contact the Product Support team at (714) 827-7600 ext 6300 M-F 8:00-5:00 PST.

In addition to the warranty, STANDARD HORIZON includes a lifetime "flat rate" and "customer loyalty" programs to provide service after the warranty period has expired. If you wish to obtain the flat rate price for out-of-warranty repair, you must include the information on the Owner's Record with the unit when you return it to your Dealer or to STANDARD HORIZON.

Lifetime Flat Rate Service Program: For the original Owner only, for the lifetime of the unit, STANDARD HORIZON will repair the unit to original specifications.

Note: The flat rate amount is payable by the Owner only if STANDARD HORIZON or the STANDARD HORIZON Dealer determines that a repair is needed. After the repair, a 90-day warranty will be in effect from the date of return of the unit to the Owner.

This service program is not available for equipment which has failed as a result of neglect, accident, breakage, misuse, improper installation or modification, or water damage (depending on the product).

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24 SPECIFICATIONS

Performance specifications are nominal, unless otherwise indicated, and are subject to change without notice. Measured in accordance with TIA/EIA-603.

24.1 GENERAL

Channels ....All USA, International and Canadian
Normal Input Voltage .... 13.8 V DC
Operating Voltage Range .... 11 V to 16.5 V
Current Drain
    Standby...0.55 A
    Receiver (at Maximum AF Output) ....0.9 A
    Transmit .... 5.0 A (Hi), 1.0 A (Lo)
DSC Transmitted Call Log 24
DSC Distress Call Log...27
DSC Received Call Log..64
Individual Call Directory..80
Group Call Directory 32
Waypoint Directory 100
Display Type .... 2.8" x 2" (70 x 51 mm)
                                                          Full Dot Matrix (222 x 162 pixels)
Dimensions (WxHxD) .... 6.9" x 4.3" x 6.8" (175.5 x 110 x 173.3 mm)
Flush-Mount Dimensions (WxHxD) .... 6.2" x 3.7" x 6.2" (157.4 x 93.4 x 158 mm)
Weight .... 3.7 lbs (1.66 kg)

24.2 TRANSMITTER

Frequency Range ....156.025 MHz to 157.425 MHz (USA)
                                    156.025 MHz to 161.600 MHz (INTERNATIONAL)
RF Output Power..25 W (Hi), 1 W (Lo)
Conducted Spurious Emissions.......................... Less than −80 dBc (Hi), −66 dBc (Lo)
Audio Response ....within +1/−3dB of a 6 dB/Octave
                                   pre-emphasis characteristic at 300 to 3000 Hz
Audio Distortion ....Less than 5 %
Modulation...16K0G3E (for Voice), 16K0G2B (for DSC)
Frequency Stability ....±0.0003 % (−20 °C to +60 °C)
FM Hum and Noise.. 50 dB

24.3 RECEIVER (for Voice and DSC)

Frequency Range ....156.050 MHz to 163.275 MHz
Sensitivity
    20 dB Quieting .... 0.35 µV
    12 dB SINAD .... 0.30 µV
    Squelch Sensitivity (Threshold) .... 0.13 µV
Modulation Acceptance Bandwidth.. ±7.5 kHz
Selectivity (Typical)
    Spurious and Image Rejection..............................80 dB for Voice (75 dB for DSC)
    Intermodulation and Rejection ....80 dB for Voice (75 dB for DSC)
Audio Output... 10 W (at 8 ohms external speaker output)
Audio Response ....within +1/–3dB of a 6 dB/Octave
                                    de-emphasis characteristic at 300 to 3000 Hz

Frequency Stability ....±0.0003 % (−20 °C to +60 °C)
Channel Spacing .... 25 kHz
DSC Format..ITU-R M.493-13
Attenuator (Local) ....Approx. 10 dB

24.4   RECEIVER (for AIS)

Frequency... 161.975 MHz (CH A), 162.025 MHz (CH B)
Sensitivity .... 0.5 μV (at 12 dB SINAD)
Selectivity(Typical)
    Spurious and Image Rejection.. 70 dB
    Intermodulation and Rejection .... 70 dB

24.5   NMEA INPUT/OUTPUT

4800 Baud selected:
    NMEA 0183 Input (4800 baud) ....GGA, GLL, GNS, RMC, GSA, & GSV
    NMEA 0183 Output (4800 baud) ....DSC, DSE, GGA, GLL, GNS,
                                                                                       RMC, GSA & GSV
    NMEA 0183-HS AIS Output (38400 baud) .... VDM
38400 Baud selected:
    NMEA 0183-HS Input (38400 baud)...................GGA, GLL, GNS, RMC, GSA, & GSV
    NMEA 0183-HS Output (38400 baud)..............................DSC, DSE, GGA, GLL, GNS,
                                                                                    RMC, GSA, GSV VDM
    NMEA 0183-HS AIS Output (38400 baud) .... VDM

24.6   SCU-31 EXTERNAL GPS ANTENNA (Optional)

Receiver Channels .... 66 Channels
Sensitivity ....Less than −147 dBm
Time to First Fix..1 minute typical (@Cold Start)
                                                                      5 seconds typical (@ Hot Start)
Geodetic Datum... WGS84

24.7 DIMENSIONS

6.2" (155.4 mm)
6" (152.4 mm)

6.9" (175.5 mm)

4.33" (110 mm)

1" (26.3 mm)   5.7" (147 mm)
4.3" (108 mm)

3.6" (91.4 mm)

1.8" (45.4 mm)   1.9" (48.5 mm)

6.1" (155.4 mm)
6" (152.4 mm)

6.9" (175.5 mm)

4.3" (110 mm)
5.3" (135 mm)
4.3" (110 mm)

1" (25 mm)

6.6" (168.4 mm)

1" (26.3 mm)   5.8" (147 mm)
4.3W" (108 mm)

3.6" (91.4 mm)

3.3" (84 mm)

1.8" (45.4 mm)   1.9" (48.5 mm)
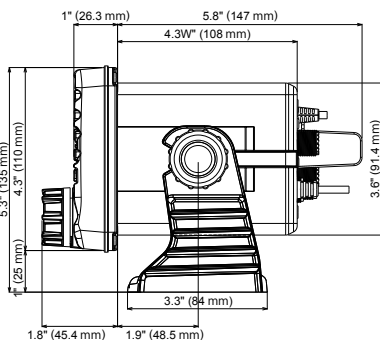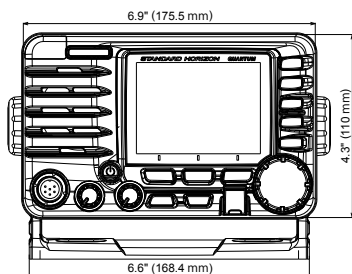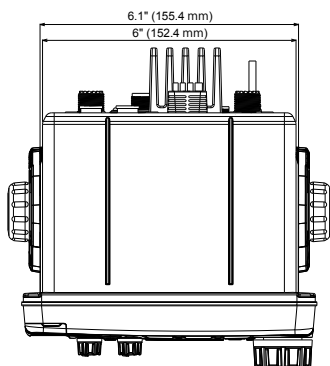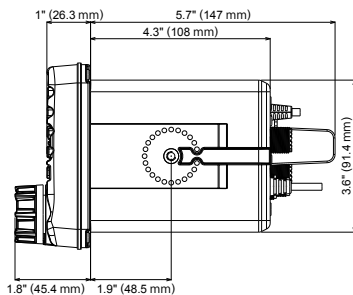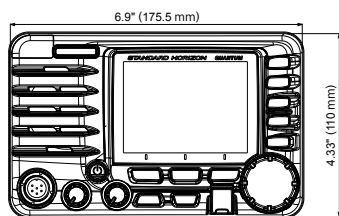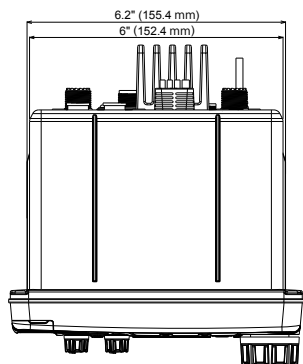
25 FCC RADIO LICENSE INFORMATION

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

25.1   STATION LICENSE

An FCC ship station license is no longer required for any vessel traveling in U.S. waters (except Hawaii) which is under 20 meters in length. However, any vessel required to carry a marine radio on an international voyage, carrying a HF single side band radiotelephone or marine satellite terminal is required to have a ship station license. FCC license forms, including applications for ship (605) and land station licenses can be downloaded via the Internet at https://www.fcc.gov/fcc-form-605. To obtain a form from the FCC, call (888) 225-5322.

25.2   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 when calling another vessel.

25.3   CANADIAN SHIP STATION LICENSING

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

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

25.4   FCC / INDUSTRY CANADA INFORMATION

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

Type Acceptance ....FCC Part 80
Output Power...1 Watt (low) and 25 Watts (high)
Emission 16K0G3E, 16K0G2B
Frequency Range ....156.025 to 163.275 MHz
FCC Type Number.. K6630593X3D
Industry Canada Type Approval 511B-30593X3D

26 FCC NOTICE

NOTICE

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

NOTICE

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

TEMPLATE for the GX6000

94 mm

158 mm

R10

Use this template to mark the location where the rectangular hole for the flush mount is to be cut.

STANDARD HORIZON

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