

GX2310S Horizon Titan 25 Watt VHF/FM Marine Transceiver

Owner's Manual

Contains:

- General Information
- Specifications
- FCC Information
- Controls and Connections
- Installation
- Operation
- Maintenance and Care
- Schematic Diagram



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SPECIFICATIONS

Performance specifications are nominal, unless otherwise indicated, and are subject to change without notice.

1.1 GENERAL

Frequency Range	156.025 to 163.275 MHz
Channels	80 total; 55 marine, 10 weather, 15 expansion
Input Voltage	13.8 VDC \pm 20%
Current Drain:	
Standby	0.5 A
Transmit	1.5 A
Dimensions (In.)	6 A (H); 1.7 A (Lx)
	2 Z/5-H x 5 J/4-W x 7 1/2-D
	(60 mm x 145 mm x 190 mm)
Weight	1.94 lb. (0.88 kg)
FCC Parts	81, 83
FCC Type Acceptance Number	APV9T20586
DOC Type Approval Number	Pending

1.2 TRANSMITTER

RF Output	25 W (H); 1 W (Lx)
Spurious and Harmonics	60 dB (H); 46 dB (Lx)
FM Hum and Noise	40 dB min.
Audio Response	within \pm 2/-8 of a 6 dB/octave pre-emphasis characteristic at 300 to 3000 Hz
Audio Distortion	5%
Modulation	16F3
Frequency Stability:	
-30° to +60°C	\pm 0.0005%

1.3 RECEIVER

Sensitivity:	
20 dB Quieting	0.35 μ V
12 dB SINAD	0.30 μ V
Squelch Sensitivity:	
Threshold	0.16 μ V
Modulation Acceptance Bandwidth	\pm 7.5 kHz
Selectivity:	
Spurious and Image Rejection	70 dB
Intermodulation and Rejection at 12 dB SINAD Sensitivity	70 dB
Audio Output at 5% Distortion	4 W
Audio Response:	within \pm 2/-8 of a 6 dB/octave de-emphasis characteristic at 300 to 3000 Hz
Frequency Stability:	
-30° to +60°C	\pm 0.0005%
Channel Spacing	25 kHz

2.1 INTRODUCTION

The Standard Communications Corporation (SCC) GX2310S Horizon Titan is a VHF/FM marine transceiver designed for use in the frequency range of 156.025 to 163.275 MHz. The GX2310S requires 13.8 VDC for operation and develops a switchable RF output power of 1 watt or 25 watts.

The GX2310S has a capacity of 80 channels: 55 marine channels, 10 weather channels, and 15 expansion channels. The 55 marine channels are switchable for use with either international or USA regulations. The transceiver can be modified for operation according to Canada regulations. Modifications can be done at your nearest dealer. The GX2310S CH16 key allows for immediate selection of emergency channel 16.

GX2310S frequencies are microprocessor controlled and phase-lock-loop synthesized.

An automatic power control (APC) protects the power circuit from overheating. An external heatsink in the rear of the transceiver dissipates heat build-up during transmission.

A multi-position mounting bracket is included which allows the GX2310S to be installed in almost any attitude. The GX2310S front panel can tilt up or down to facilitate easy use in the chosen installation site. An optional mounting bracket, CMB10 can also be used to install the transceiver.

The GX2310S comes equipped with a fixed condenser microphone and a microphone hanger. A power cord for connection to a 13.8 VDC power source is also included.

2.2 FCC INFORMATION

The GX2310S complies with the Federal Communications Commission (FCC) requirements that regulate Maritime Radio Service. The user must know and comply with all applicable parts of FCC Rules and Regulations. Rules applicable to each service may be ordered from:

SUPERINTENDENT OF DOCUMENTS
Government Printing Office
Washington, D.C. 20402

A valid station license and call sign issued by FCC is required before operating the GX2310S. It is the user's responsibility to file FCC Form 506 and Form 753 to operate a transceiver. Form 506 is a ship station license to install a transceiver on the ship. Form 753 is a restricted radio operator's license.

The following data pertaining to the GX2310S will need to be included on the FCC license application.

Type Accepted FCC Parts 81, 83
Output Power 1 watt and 25 watts
Emission 16F3
Frequency Range 156.025 to 163.275 MHz

The FCC requires that a copy of Parts 81 and 83 be kept aboard the ship at all times. The FCC application contains an order form for these regulations.

The onboard transceiver must be manned by a licensed radio operator. Others may speak into the microphone if the operator starts the transmission, identifies the transmission, supervises it, ends it, and logs it.

The operator is at all times responsible for the lawful operation of the station. Distress and safety communications must have absolute priority over other kinds of ship-to-ship and ship-to-shore calls.

2.3 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.

1. Never key the transmitter unless an antenna or suitable dummy load is connected to the antenna receptacle.
2. Ensure that the input voltage does not exceed 16 VDC or fall below 11 VDC.

2.4 MODIFICATION FOR CANADA OPERATION

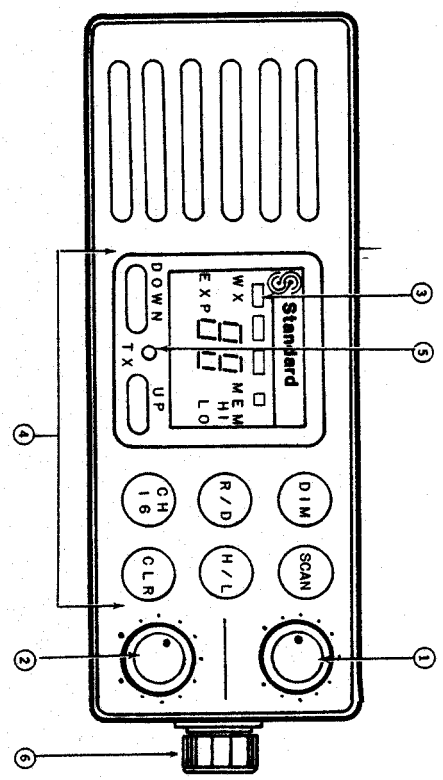
For operation in Canada frequencies, install a 1S1555 diode (SCC Part Number HD20011050) in the front panel P.C. Board (PL01) at the location of QL13.

If diode is installed, the transceiver will operate in the Canada and international modes only. The display will indicate "C" for Canada operation.

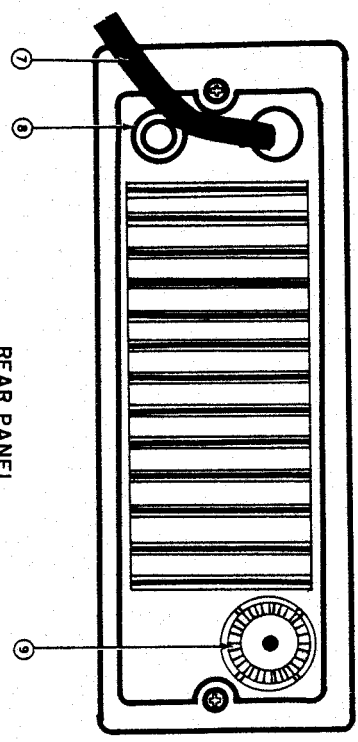
3.1 GENERAL

Refer to Figure 1 for the location of the controls.

- ① **POWER SWITCH/VOLUME CONTROL**
Turn the control clockwise to increase the volume. Turn the control further clockwise to increase the volume.
- ② **SQUELCH CONTROL**
Turn the control fully counterclockwise without any input signal until white noise can be heard. Turn the control slowly clockwise until no white noise can be heard.
- ③ **LCD**
 - 1. CH DISPLAY - displays the operating channel for transmission or reception.
 - 2. U,I, and C INDICATORS - indicates the mode of operation for a particular marine channel.
 - 3. WX INDICATOR - indicates a weather channel.
 - 4. EXP INDICATOR - indicates the expansion channel.
 - 5. MEM INDICATOR - indicates that channels have been programmed in the microprocessor.
 - 6. HI, LO INDICATORS - indicates the power during transmission. "HI" is displayed when the power is high. "LO" is displayed when the power is low. The display is blank for a transmission-inhibited channel.
 - 7. D INDICATOR - indicates a duplex channel.
- ④ **KEYBOARD**
The keyboard consists of eight switches which function as follows.
 - 1. DIM key - switches the LCD on and off.
 - 2. SCAN key - for two or more programmed channels, this key is used to start busy scanning between the channels for 100 milliseconds per channel.



FRONT PANEL



REAR PANEL

FIGURE 1. CONTROLS LOCATION

3. R/D key - used to program channels in the microprocessor. Press once to program a channel and press again to delete a channel.

4. HI/LO key - used to alternate power between high and low.

5. DOWN I key - used to decrease channel number by one, each time the key is pressed. If held depressed, the channel decreases continuously at a rate of 12 channels per second. To select an international channel, press this key and the CH16 key simultaneously.

6. UP U key - used to increase channel number by one each time the key is pressed. If held depressed, the channel number increases continuously at a rate of 12 channels per second. To select a USA channel, press this key and the CH16 key simultaneously. When this key is pressed during scanning mode, scanning resumes from the next channel.

7. CH16 key - used to immediately recall channel 16 from any channel. Press this key and the UP or DOWN key simultaneously to switch to USA or international channel respectively.

8. CLR key - used for the following:
- microprocessor resetting - press this key and turn the power on to initialize the microprocessor.
- scan clearing - press this key during the scanning to clear the scanning mode.
- revert function - after pressing the CH16 key to recall channel 16, press this key to return to the previous channel.

3.2 GX2310S REAR PANEL

7 POWER CORD

This cord is used to connect the transceiver to a DC power supply of 13.8 volts.

8 EXTERNAL SPEAKER JACK

This jack is used to connect the transceiver to an external speaker with an impedance of 4 to 8 ohms.

9 ANTENNA JACK

This jack is used to connect the transceiver to an antenna with impedance of 50 ohms.

3.3 EXPANSION CHANNEL SETTING

A maximum of 15 expansion channels can be set between CH88 and WX01.

3.3.1 Controls

1. UP and DOWN keys - used to determine the expansion channel selection chart position, moving up or down from 0 to 159.
2. CH16 key - press this key to display the expansion address (from EXP01 to EXP15).
3. SCAN key - press this key to switch the reception frequency between duplex and simplex.
4. H/L key - press this key to switch the transmission power to low, high or transmission-inhibited.
5. R/D key - used to program the expansion channel to expansion address in the microprocessor.
6. CLR key - used to clear the programmed expansion channel from the expansion address in the microprocessor.
7. DIM key - changes to the next expansion address.

3.3.2 Programming Procedure

1. Remove the two screws at the rear of the transceiver.
2. Slide the main case off the the transceiver.
3. Locate the expansion switch, S201 on the bottom P.C. Board. Refer to Figure 2.
4. Slide the expansion switch to the "EXP ON" position. The display should show:



5. Press the CH16 key. The display should show the address:



If the display does not show the above, press the CH16 key and hold it. Press the DIM key until the display shows "01".

6. From the Expansion Channel Selection Chart, choose the frequencies desired and the corresponding channel number to be programmed on address "01". There are 160 channel numbers, 00 to 159.

7. Press the UP or DOWN key until the desired number is displayed and starts blinking.



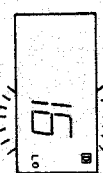
8. Press the SCAN channel to program either simplex or duplex operation of the receive frequency. For duplex operation, the display should show:



For simplex operation, the display should show:



9. Press the H/L key to program high (HI) or low (LO) power. The display should show HI or LO.



10. Press the R/D key once. The channel number should stop blinking. Programming is completed.



11. To delete a programmed channel from the microprocessor, press the CLR key.

12. If other channel numbers are to be programmed, repeat steps 5 to 10 for addresses 02 to 15.

13. Slide the expansion switch to the OFF position. The display should show:



14. To check if expansion channel has been correctly programmed, press the UP key until the display shows channel 88. Press the UP key again. The display should show the address 01 with "EXP" illuminated on the LCD. If other channel numbers have been

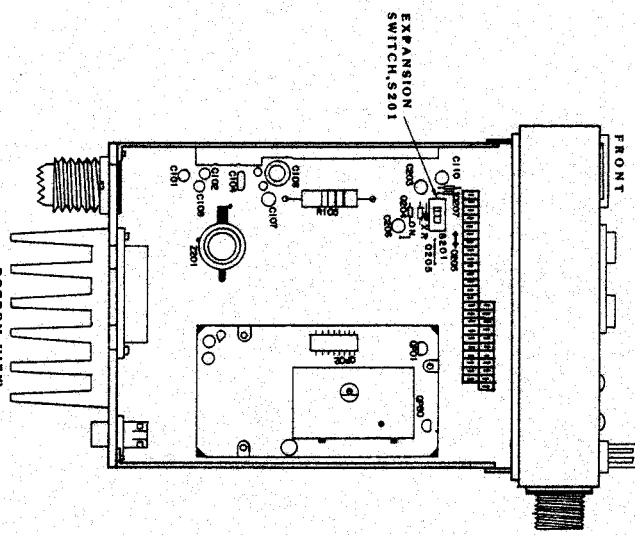


FIGURE 2. EXPANSION SWITCH LOCATION

programmed, successive pressing of the UP key will show the addresses that have been programmed (02 to 15).



4.1 FCC REQUIREMENTS
 FCC regulations require that the transceiver's deviation and frequency be tested before initial installation or operation. Before performing the following procedure, conduct the performance test in the Maintenance Section of this manual.

4.2 INSTALLATION WITH REGULAR MOUNTING BRACKET

1. The transceiver can be mounted at any angle. Choose a location to mount the transceiver that allows:
 - o enough distance from any compass magnet readings due to the speaker magnet
 - o protection from sea spray and rain
 - o accessibility to front panel controls
 - o connection to a power source and an antenna
 - o nearby space for installation of a microphone hanger
2. Mount the bracket using the washers, nuts and long hex head bolts.
3. Fix the attitude of the front panel. The front panel can tilt up or tilt down. See Figure 3 for front panel orientation.

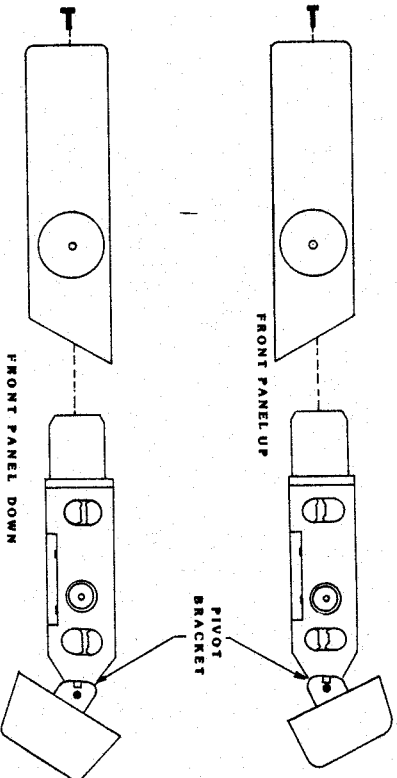
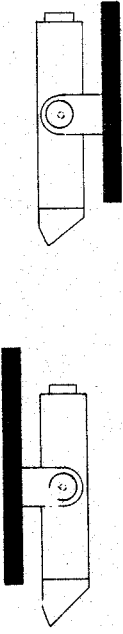


FIGURE 3. FRONT PANEL ORIENTATION

4. Thread the mylar washers onto the mounting bracket knobs.
5. Position the transceiver within the bracket arms, matching the bracket and transceiver notches to effect the desired positioning.
6. Secure the transceiver to the brackets with the mounting knobs as shown in Figure 4.



THE TRANSCEIVER CAN BE MOUNTED IN EITHER OF THE POSITIONS SHOWN ABOVE.

FIGURE 4. INSTALLATION WITH REGULAR BRACKET

7. At the rear of the transceiver, connect the antenna cable to the antenna jack (see Figure 5). The antenna must have a PL259 connector. RG8 coaxial cable must be used if the antenna is 25 feet or more from the transceiver. RG58 cable can be used for distances less than 25 feet.

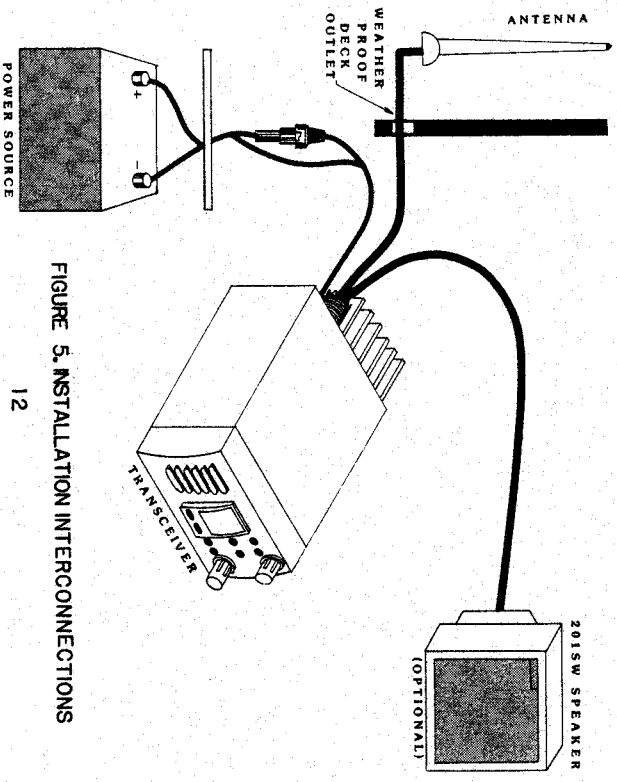


FIGURE 5. INSTALLATION INTERCONNECTIONS

8. Connect the red power cord to a +13.8 VDC $\pm 20\%$ power source. Connect the black power cord to negative ground. See Figure 5 for this step.
9. Use a thru-line wattmeter to confirm that the voltage-standing wave ratio is 1.5 to 1 or better.

4.3 INSTALLATION WITH CMB10 MOUNTING BRACKET (Optional)

Refer to Figure 6 for the following procedure.

1. Remove the two screws at the rear of the transceiver.
2. Slide the main case off the transceiver.
3. Remove the three rubber seals on top or bottom of transceiver main case depending on the desired installation position.
4. Slide the black plate that comes with the CMB10 kit, under the holes where the rubber seals were removed.
5. Install the three screws on the holes inside the case. Ensure that the screws fit snugly into the holes.
6. Attach the flat washers, lock washers, and nuts on top of the case.
7. Tighten the nuts using the wrench/key that comes with the CMB10.
8. Attach the mounting bracket on the desired location.
9. Slide the nuts on the transceiver into the holes on the mounting bracket until the transceiver is firmly in place.
10. The transceiver is locked in place and can only be detached using the wrench/key provided. Insert the wrench/key on the slot as shown in Figure 6. The transceiver can now be detached by simply sliding the the nuts off the mounting bracket.

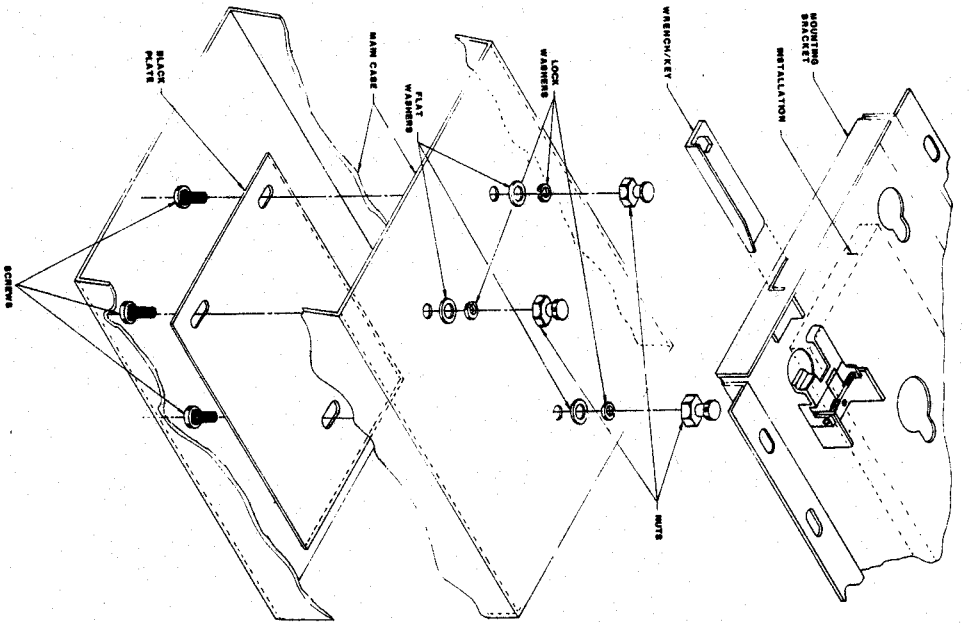


FIGURE 6. INSTALLATION USING THE CMB10 MOUNTING BRACKET (OPTION)

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- 4.4 INSTALLATION WITH CMB11 FLUSH MOUNT BRACKET
- Refer to Figure 7 for the following procedure.
1. Use the template that comes with the CMB11, to mark the area (inner template) where a rectangular hole (5 7/8 by 2 5/8 inches) is to be made and the screw locations. Confirm that the space behind the dash or panel is deep enough to accommodate the transceiver. There should be at least a 1/2-inch space between the heatsink of the transceiver and the wall.
 2. Cut out the rectangular hole and mark holes for the screws.
 3. Insert transceiver in bracket and fasten with the two screws provided with the CMB11. Connect the antenna and power cables.
 4. Slide the bracket into the hole. Fasten the four screws into the holes in front of the bracket.

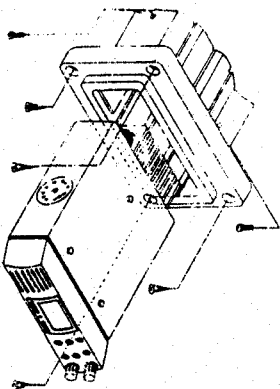


FIGURE 7. INSTALLATION WITH CMB11 FLUSH MOUNT BRACKET

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