

14.12 SUMMARY OF THE DSC SETUP MENU

Item	Description	Default Value
INDIVIDUAL DIR.	Sets addresses used for individual call	-
INDIVIDUAL REPLY	Selects a reply to individual call	MANUAL
INDIVIDUAL ACK.	Selects the message to be sent automatically as an individual call acknowledgement	ABLE TO COMPLY
INDIVIDUAL RING	Selects the ringing time when an individual call or a position request	2 min
GROUP DIR.	Sets addresses used for group call	-
POSITION REPLY	Selects a reply to position request	AUTO
AUTO POS POLLING	Switches on and off of the AUTO POS POLLING function	AUTO POS REQUEST
AUTO POS INTERVAL	Sets the transmission interval of AUTO POS POLLING signal	5 min
AUTO CH CHANGE	Selects the delay time to move to the requested channel automatically after receiving a distress call, All Ship call, or group call	30 s
POS UNFIX WAIT	Sets the maximum wait time till obtaining a position information when receiving a distress call, POS Report call, or acknowledgement to POS request call	15 s
DSC BEEP	Switches on and off of the alarm sound when receiving a DSC call	INDIVI.: On All Ship: On GROUP: On POS RQ.: Off POS RP: Off Geog.: On Polling: On Test Call: On

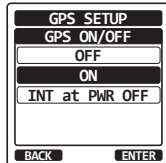
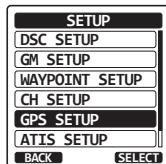
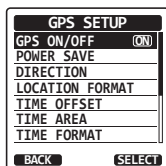
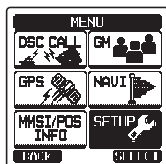
15 GPS SETUP

The “GPS Setup” mode allows the parameters for the **HX870** internal GPS unit to be custom-configured for your operating requirements.

15.1 GPS ON/OFF

This selection allows the internal GPS unit to be turned on or off to conserve battery power. The default setting is “ON”.

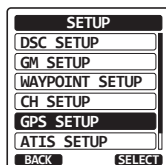
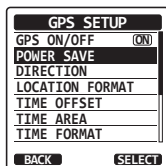
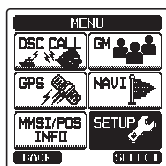
1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the [**SELECT**] soft key, then select “GPS ON/OFF” with the **CH▲/CH▼** key.
4. Press the [**SELECT**] soft key.
5. Press the **CH▲/CH▼** key to select “ON”.
6. Press the [**ENTER**] soft key to save the new setting.
7. Press the **CLR** key to return to radio operation.



15.2 POWER SAVE

This menu item selects the Battery Save Mode for the internal GPS unit. The default setting for the Power Save Mode is “AUTO”.

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the [**SELECT**] soft key, then select “POWER SAVE” with the **CH▲/CH▼** key.
4. Press the [**SELECT**] soft key.



5. Press the **CH▲/CH▼** key to select the desired level.

OFF: GPS Signals are always being received.

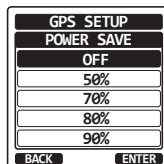
AUTO: Activates the GPS receiver automatically when GPS signals are received.

50%: Activates the GPS receiver for 3 seconds every 3 seconds.

75%: Activates the GPS receiver for 3 seconds every 9 seconds.

90%: Activates the GPS receiver for 3 seconds every 27 seconds.

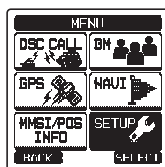
6. Press the **[ENTER]** soft key to store the selected setting.
7. Press the **CLR** key to return to radio operation.



15.3 LOCATION FORMAT

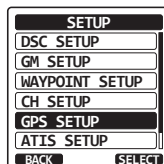
This menu item selects the coordinate system to be shown on the **HX870** display. The default setting is “ddd mm.mmm”.

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.

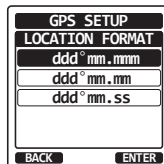
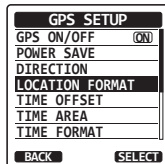


2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.

3. Press the **[SELECT]** soft key, then select “LOCATION FORMAT” with the **CH▲/CH▼** key.



4. Press the **[SELECT]** soft key, then press the **CH▲/CH▼** key to select the desired coordinate system. The location format can be selected from “ddd’mm.ss”, “ddd’mm.mm”, and “ddd’mm.mmm”.



5. Press the **[ENTER]** soft key to save the new setting.
6. Press the **CLR** key to return to radio operation.

15.4 TIME OFFSET

Sets the local time offset between UTC (Universal Time Coordinated) and local time shown on the display. The offset is added or subtracted from the time received from the GPS or chart plotter. Time is only displayed when a GPS or chart plotter is connected.

Refer to section “**6.4 CHANGING THE GPS TIME**” for details.

15.5 TIME AREA

This menu selection allows the radio to show UTC time or local time with the offset.

Refer to section “6.5 CHANGING THE TIME LOCATION” for details.

15.6 TIME FORMAT

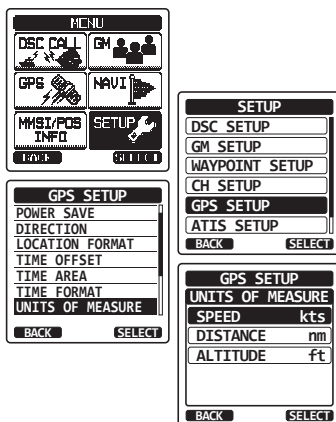
This menu selection allows the radio to show time in 12-hour or 24-hour format.

Refer to section “6.6 CHANGING THE TIME FORMAT” for details.

15.7 UNIT OF MEASURE

This section allows you to set the speed, distance and altitude units.

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then press the **CH▲/CH▼** key to select “UNIT OF MEASURE”.
4. Press the **[SELECT]** soft key.
5. Press the **CH▲/CH▼** key to select the item you want to set.
6. Press the **[SELECT]** soft key.
7. Press the **CH▲/CH▼** key to select the unit.
8. Press the **[ENTER]** soft key to store the new setting.
9. Press the **CLR** key to return to radio operation.



15.8 PINNING

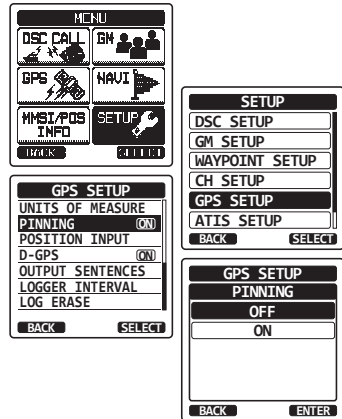
This selection is used to enable or disable position updates when the vessel is not underway. The default setting is “OFF”.

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then select “PINNING” with the **CH▲/CH▼** key.
4. Press the **[SELECT]** soft key.
5. Press the **CH▲/CH▼** key to select “ON” or “OFF”.

ON: When pinning is turned on, the **HX870** will not update its position unless the vessel travels over 10Ft.

OFF: When the vessel is underway or stopped, the **HX870** continuously updates its position (unless transmitting). This improves accuracy of the position fix.

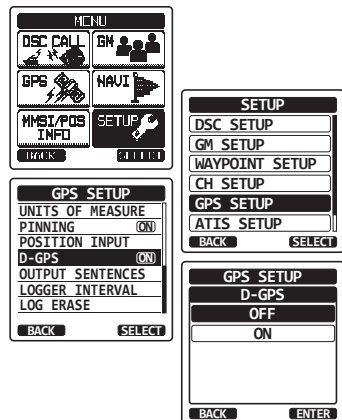
6. Press the **[ENTER]** soft key to save the new setting.
7. Press the **CLR** key to return to radio operation.



15.9 SBAS (Satellite Based Augmentation System)

This selection enables or disables SBAS such as WAAS, EGNOS and MSAS as some areas (Australia for example) can have problems with GPS reception with SBAS enabled. The default setting is “ON”.

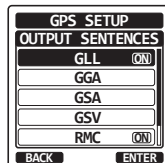
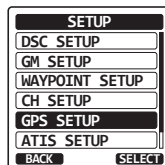
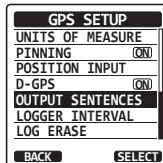
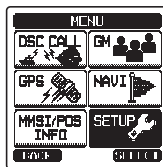
1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then press the **CH▲/CH▼** key to select “D-GSP”.
4. Press the **[SELECT]** soft key.
5. Press the **CH▲/CH▼** key to select “ON” or “OFF”.
6. Press the **[ENTER]** soft key to store the new setting.
7. Press the **CLR** key to return to radio operation.



15.10 OUTPUT SENTENCES

This selection is used to setup the NMEA output sentences of the **HX870**.
By default, all the NMEA sentences are turned “OFF”.

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then select “OUTPUT SENTENCES” with the **CH▲/CH▼** key.
4. Press the **[SELECT]** soft key.
5. Press the **CH▲/CH▼** key to select the desired sentence type, then press the **[ENTER]** soft key.
6. Press the **CH▲/CH▼** key to select “ON” or “OFF”.
7. Press the **[ENTER]** soft key to save the new setting.
8. Repeat steps 5 through 7 to set the other sentences.
9. Press the **CLR** key to return to radio operation.



15.11 LOGGER INTERVAL

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then select “LOGGER INTERVAL” with the **CH▲/CH▼** key.
4. Press the **CH▲/CH▼** key to select the desired time and press the **[ENTER]** soft key.
5. Press the **CLR** key to return to radio operation.

Log time for each logger interval setting

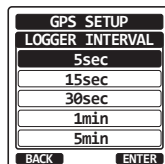
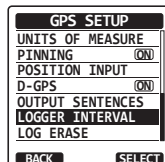
5 sec: Aprox. 8 hours

15 sec: Aprox. 25 hours

30 sec: Aprox. 50 hours

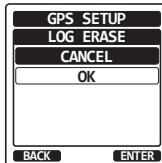
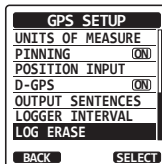
1 min: Aprox. 100 hours

5 min: Aprox. 500 hours



15.12 LOG ERASE

1. Press the **MENU** key to display “MENU”, then select “SETUP” with the **CH▲/CH▼/◀/▶** key.
2. Press the **CH▲/CH▼** key to select “GPS SETUP” menu.
3. Press the **[SELECT]** soft key, then select “LOGGER ERASE” with the **CH▲/CH▼** key.
4. Select “CANCEL” or “OK” on the confirmation screen, then press the **[ENTER]** soft key.
5. Press the **CLR** key to return to radio operation.



15.13 SUMMARY OF THE GPS SETUP

Item	Description	Default Value
UNIT POWER	Switches on and off of the GPS unit power	ON
POWER SAVE	Selects the power save mode of the GPS unit	AUTO
LOCATION FORMAT	Selects the coordinate system to be displayed	dd mm.mmm
TIME OFFSET	Sets the offset time from the UTC (available only when “LOCAL” is selected in the item “TIME AREA”)	00:00
TIME AREA	Selects the time location to be displayed from UTC or local	UCT
TIME FORMAT	Selects the time format from 12-hour or 24-hour display (fixed to “24H” when “UTC” is selected in the item “TIME AREA”)	24H
UNIT OF MEASURE	Selects the unit when displaying speed, distance, and altitude	SPEED: kts DISTANCE: nm ALTITUDE: ft
PINNING	Switches on and off of position updates for vessel not underway	OFF
D-GPS	Switched on and off of use of SBAS	ON
OUTPUT SENTENCES	Selects a sentence to be output to the USB terminal	OFF
LOGGER INTERVAL	Selects the interval time of logging	1 min
LOG ERASE	Erases the log data	-

16 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 8.5 VDC or fall below 6 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 “**18 WARRANTY**”.

16.1 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.

- **SBH-12** Charger Cradle: XXX
- **CAT460** Antenna: AY139X001
- **Belt Clip** (CLIP-22): XXX
- **MIC/SP** Plastic Cap: RA108700B
- **MIC/SP** Cap O-Ring: RA046760A
- **MIC/SP** Rubber: RA1555900

16.2 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.

16.3 TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	REMEDY
The USA/INTL/CAN modes do not function.	Proper operation not followed.	Specify the item number from “SETUP MENU” – “CH SETUP” – “CH GROUP”.
Cannot output sound by pressing and holding the SQL key.	Low battery.	Charge battery. Refer to section 6 of this manual.
	Audio volume level is too low.	Press the VOL+ key until background noise outputs.
Keys do not function.	Key Lock is “on”.	Press and hold the ON key to unlock.
Cannot transmit a DSC Call.	MMSI number is not programmed.	Program the MMSI number. Refer to section “ 9.2.2 Programming the MMSI ”.
Cannot fix the GPS satellites.	Internal GPS receiver is “off”.	Internal GPS receiver is “on”. Refer to “ 14.1 GPS ON/OFF ”.
	Poor location for GPS satellite reception.	Move to a less obstructed position.
Indicator does not light when charging a battery.	Defective battery SBR-13LI .	Contact Standard Horizon dealer.
	The transceiver is not set onto the SBH-12 Charger Cradle properly.	Set the transceiver onto the SBH-12 Charger Cradle properly.
	Power is not supplied to the SBH-12 Charger Cradle.	Connect SAD-11B or E-DC-19A to the SBH-12 Charger Cradle for AC/DC power supplies.

17 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
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
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
22			X	D	157.100	161.700	Port operation, ship movement
22A	X	X		S	157.100		US and Canadian Coast Guard Liaison and ari- time 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
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)
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)

VHF MARINE CHANNEL CHART							
CH	U	C	I	S/D	TX	RX	CHANNEL USE
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 onl
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 communi-cations 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 only, 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 move- ment
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
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
78A	X	X		S	156.925		Non-commercial (Recreational)
79			X	D	156.975	161.575	Port operation and Ship movement
79A	X	X		S	156.975		Commercial

VHF MARINE CHANNEL CHART

CH	U	C	I	S/D	TX	RX	CHANNEL USE
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	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
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.

18 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 defective 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).

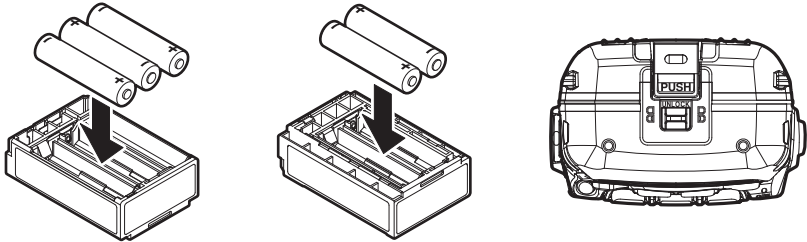
19 INSTALLATION OF THE SBT-13

The **SBT-13** is a battery case that holds five “AAA” size Alkaline batteries and is used with the **HX870** transceiver. The Alkaline batteries can be used for receiving and transmission in an emergency, and battery life will be shortened dramatically.

1. Slide the five “AAA” size Alkaline batteries into the **SBT-13** with the Negative (-) side of the batteries touching the spring connections inside the **SBT-13**.
2. Slide the battery cover lock switch to the “**UNLOCK**” position, then press “**PUSH**” to open the battery cover.
3. Install the **SBT-13** into the battery rest on the bottom of the transceiver pushing it to the battery contacts until it clicks.
4. Attach the battery cover, then slide the battery cover lock switch to the “**LOCK**” position.

NOTE

When the **SBT-13** Alkaline Battery Case is used, the **HX870** transmit output is fixed to 1 W.



20 SPECIFICATIONS

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

20.1 GENERAL

Frequency Range	TX: 156.025 MHz - 157.425 MHz RX: 156.050 MHz - 163.275 MHz
Channel Spacing	25 kHz
Frequency Stability	± 3 ppm (-4 °F to $+140$ °F [-20 °C to $+60$ °C])
Emission Type	16K0G3E for Voice, 16K0G2B for DSC
Antenna Impedance	50 Ω
Supply Voltage.....	7.4V DC, Negative Ground (Battery Terminal)
Current Consumption	330 mA (Receive) 100 mA (Standby, GPS On) 60 mA (Standby, GPS Off) 1.6 A / 1.0 A / 0.7 A (TX: 6W / 2W / 1W)
Operating Temperature.....	-4 °F to $+140$ °F (-20 °C to $+60$ °C)
DSC Individual Directory	100 Memories
DSC Group Directory.....	20 Memories
DSC Format.....	ITU-R M.493-13
NMEA Output.....	DSC, DSE, GLL, GGA, GSA, GSV, and RMC
Case Size (W x H x D).....	2.44" x 5.43" x 1.69" (62 mm x 138 mm x 43 mm) (w/o knob & antenna)
Weight	11.36 oz (322 g) w/ SBR-13LI, hand strap, belt clip & antenna

20.2 TRANSMITTER

RF Power Output.....	6 W (HI) / 2 W (MIDDLE) / 1 W (LOW) (@7.4 V)
Modulation Type	Variable Reactance
Maximum Deviation	± 5 kHz
Spurious Emission.....	-75 dBc typical
Microphone Impedance	2 k Ω

20.3 RECEIVER (for Voice and DSC)

Circuit Type.....Double-Conversion Superheterodyne
Intermediate Frequencies.....for Voice 1st: 38.85 MHz
2nd: 450 kHz
for DSC 1st: 30.4 MHz
2nd: 450 kHz
Sensitivityfor Voice 0.25 μ V for 12 dB SINAD
for DSC 0.5 μ V for 12 dB SINAD
Adjacent Channel Selectivity 70 dB typical
Intermodulation..... 70 dB typical
Hum & Noise Ratio40 dB
Selectivity 12 kHz / 25 kHz (-6 dB / -60 dB)
AF Output (Internal SP) 700 mW @16 Ω for 10 % THD (@7.4 V)

20.4 GPS

Receiver Channels66 channels
Sensitivity Less than -147 dBm
Time to First Fix..... 1 min typical (@Cold Start)
5 sec typical (@Hot Start)
Geodetic Datum..... WGS84

20.5 NMEA OUTPUT

NMEA 0183 Output Sentence (9600 baud)..... DSC, DSE, GGA, GLL,
RMC, GSA & GSV

21 FCC RADIO LICENSE INFORMATION

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

21.1 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 <http://www.fcc.gov/Forms/Form605/605.html>. To obtain a form from the FCC, call (888) 225-5322.

21.2 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.

21.3 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**

21.4 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), 2 Watts (middle) and 6 Watts (high)
Emission 16K0G3E, 16K0G2B
Frequency Range 156.025 to 163.275 MHz
FCC Type Number..... K6630573X30
Industry Canada Type Approval 511B-30573X30

22 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 Yaesu 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.

CONSIGNES DE SECURITE

Votre émetteur-récepteur portatif sans fil contient un émetteur à faible puissance. Lorsque vous appuyez sur le bouton Push-to-Talk (PTT), l'émetteur-récepteur émet des signaux de radiofréquence (RF). En août 1996, la FCC (Commission Fédérale des Communications) a adopté des directives relatives à l'exposition aux RF avec des niveaux de sécurité pour les appareils sans fils portatifs.

Le fonctionnement de cet appareil est autorisé à un facteur d'utilisation ne dépassant pas 50 % (correspondant à 50% de la durée de transmission et 50% de la durée de réception).

AVERTISSEMENT: Pour assurer la conformité avec les directives d'exposition RF de la FCC, cet émetteur-récepteur et son antenne doivent être maintenus à une distance minimum d'un pouce (2,5 centimètre) de votre visage. Parlez avec une voix normale, avec l'antenne dirigée vers le haut et éloignée du visage, à la distance requise.

Si vous utilisez un casque pour cette radio, et que vous portez la radio sur vous, utilisez exclusivement le clip de ceinture Yaesu pour cet émetteur-récepteur, et assurez-vous que l'antenne se trouve à une distance minimum d'un pouce (2,5 centimètres) de votre corps pendant l'émission.

Utilisez exclusivement l'antenne fournie. Les antennes, les modifications ou les accessoires non autorisés peuvent endommager l'émetteur-récepteur et enfreindre les réglementations FCC.

23 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.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

Changes or modifications to this device not expressly approved by YAESU U.S.A. could void the User's authorization to operate this device.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur. l'établissement d'une communication satisfaisante.

STANDARD HORIZON

Nothing takes to water like Standard Horizon

YAESU U.S.A.

6125 Phyllis Drive, Cypress, California 90630

www.standardhorizon.com



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