

HT644 User Guide

v03/10

Professional submersible marine handheld transceivers



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Certification

CE Compliance Statement

The HT644 transceiver displays "CE" on the serial number label, indicating its compliance with the essential requirements of the EEC directive for Electromagnetic Compatibility.

Declaration of Conformity

Entel UK Limited
320 Centennial Avenue
Centennial Park
Elstree
Borehamwood
Hertfordshire
United Kingdom
WD6 3TJ

Declare under our sole responsibility that the product:-
HT644 series VHF handheld transceiver

Serial Number _____

To which this declaration relates, is in accordance with directive 99/5/EC and conforms to the following standard or other nominative documents:-
EN 301 178-2 V.1.2.2 (2000-08), EN60950 August 1992, AII 1997 EN 60945 2002 & ETS 300 698 Annex B December 1996

Following provisions of the R&TTE directive.

M Austin



Introduction

The Entel HT644 is a professional marine handheld transceiver that operates on the VHF marine band. The HT644 has 58 marine international channels, 10 weather & 36 dealer programmable private channels. The 58 marine channels are switchable to comply with USA, International or Canadian regulations. This is done via the radio's keypad. It has an emergency channel, which can be immediately selected from any channel using the red 16/9 button. Weather channels can also be accessed immediately using the [WX] key.

The HT644 includes the following features: Scan, A/B quick access channels, battery life indicator, VOX (voice activated transmit), low battery indicator, large LCD with back light.

Packing List

- HT644 transceiver
- CNB750E Rechargeable 1800mAh Li-Ion battery
- CBH750 Spring loaded belt clip
- CBH750 Spring loaded belt clip
- CATXX Antenna
- CCA trickle charger included with certain models

Radio Care

Advice

- Do not use options or accessories not specified by Entel
- Ensure that the radio is used within the parameters for which it was designed
- Please switch the transceiver off before connecting optional accessories

Warning

Turn the transceiver off in the following locations:

- In explosive atmospheres (flammable gas, dust including metallic & grain powders etc)
- Whilst taking on fuel or while parked near a fuel station
- Near explosives or blasting sites
- In aircraft, medical institutions or near persons known to be wearing a pacemaker

Caution

- Do not disassemble or modify the transceiver for any reason
- Do not transmit while touching the antenna terminal or any exposed metallic parts of the aerial as this may result in a burn
- Please check and observe regulations in your country with regard to use whilst driving

Cleaning your Radio

After exposure to any potentially corrosive substance including salt water it is recommended to thoroughly wash the transceiver in fresh water. If washing with the battery removed from the radio, ensure that the battery is not immersed in water & clean only with a damp cloth.

Note: Do not wash the transceiver if you suspect the waterproofing seal may be damaged. Please return to your supplier for inspection / repair.



End of Life Disposal

When your Entel transceiver reaches the end of its useful life, please ensure that the unit is disposed of in an environmentally friendly way. For country specific information please see www.entel.co.uk/recycling.

Preparing Your Radio For Use

Attaching / Removing the Battery Pack **1**

1 To attach, locate the pegs on the bottom of the battery into the slots on the radio and press the top of the battery against the radio. Secure battery by tightening the screw clockwise by hand. (Do not over tighten)

2 To remove, unscrew the locking screw anticlockwise & pull the battery away from the top of the radio.



Attaching / Removing the Aerial

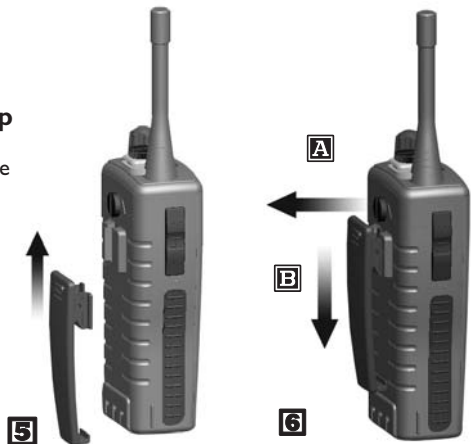
3 To attach, carefully align the aerial with the socket. Screw in the aerial clockwise (taking care not to cross the thread) until it is seated firmly against the top of the radio.

4 To remove, unscrew the aerial anti-clockwise.

Attaching / Removing the Belt Clip

5 To attach, slot the clip onto the slot on the back of the battery and slide up until you hear a "click"

6 To remove, pull the tab towards the belt clip **(A)**. Then slide the belt clip downwards **(B)**



Battery Care / Information

Introduction

Your Entel radio is supplied with a high performance Lithium-Ion (Li-Ion) battery. These batteries:

- Extend talk time
- Reduce the battery's size and weight
- Do not suffer from 'memory effect' that reduces the life of Ni-Cad and NiMH batteries
- Have a low toxicity, therefore reducing the impact on the environment

Battery Pack Precautions

- Switch the transceiver OFF before charging
- Charge the battery pack before use
- Do not recharge the battery pack if it is already fully charged
- Charge the battery in accordance with the instructions enclosed with your charger
- Do not charge the transceiver and/or battery pack if they are wet

The battery pack includes potentially hazardous components. Please:

- Do Not disassemble or reconstruct battery
- Do Not short-circuit the battery
- Do Not incinerate or apply heat to the battery
- Do Not immerse the battery in water unless attached securely to the radio or get it wet by other means
- Use only the specified charger and observe charging requirements
- Do Not pierce the battery with any object or strike it with an instrument
- Do Not use the battery pack if it is damaged in any way
- Do Not reverse-charge or reverse-connect the battery
- Do Not touch a ruptured or leaking battery.

If liquids from the battery get into your eyes, immediately: Wash your eyes out with fresh water & avoiding rubbing them. Seek medical treatment.

Warranty

The warranty on all batteries is 12 months from new.

Battery Pack

- If a battery is not to be used for an extended period of time (e.g. several months) remove the battery pack from the equipment and store in a cool and dry location (around 0°C) part charged. Do not fully discharge the battery before storage
- Each charge cycle reduces the battery's life. Minimise the number of times you charge your battery especially in hotter environments which further shortens a battery's life

Battery Charging

1. Connect the AC adapter to the charger pod. The LED status light will illuminate green indicating ready for charge
2. Turn the transceiver off
3. Insert the battery pack into the charger pod, either with or without the transceiver attached. The LED status light changes from green to RED & trickle charge begins
4. A fully discharged battery pack will take approximately 6 hours to charge, depending on the remaining power condition. When charge is complete, the LED status light turns green.

Battery Indicator

For your safety and convenience your transceiver continually monitors the battery pack and gives an indication on the LCD:

- 3 Segments: 12hours
- 2 Segments: 1hour
- 1 Segment: 20mins



Note: Only genuine Entel batteries should be used. Customer satisfaction is assured as you can not be supplied with sub standard, potentially dangerous battery packs from 3rd party manufacturers, ensuring it delivers the expected capacity and endurance.

On HT series batteries a breathable membrane is used. This is clearly marked on the battery label. Piercing the membrane will allow water ingress to the battery, & will invalidate the warranty.

Using Your HT644

Turning The Radio On & Off

Turn the ON/OFF control on the top of the radio clockwise until the LCD illuminates & a short beep is emitted. To turn the radio off turn the ON/OFF control anti-clock wise until the LCD deluminates.

Using Your radio

Before using your radio you may need to adjust the volume on the radio to take in to account background noise. Adjust the volume using the rotary control on the top of the radio.

Reception

1. Turn the transceiver on by rotating the volume control in a clockwise direction. A power on tone is generated after 1 second to indicate the transceiver has passed its self-diagnostic test. During standby the LED indicator will pulse amber every 3 seconds, to further verify its circuitry is functioning correctly. Select the desired audio level by further rotating the control clockwise. After power-on, the transceiver will always default to the last channel selected.
2. Turn the squelch control fully counter clockwise, then rotate clockwise until the white noise stops. This condition is known as the "squelch threshold". If the control is turned clockwise past this point, weak signals may not be received. No noise or signal is heard until a signal is received that exceeds the squelch threshold.
3. Select the desired channel using the [UP/DOWN] buttons. A full listing of channels can be found on page 22-24. Sometimes, a slight adjustment of the squelch threshold is needed as some channels have a higher noise level than others.
4. When receiving a signal the LED indicator illuminates green. An "RX" is also displayed on the LCD.

Transmitting

1. Perform steps 1 through 3 of RECEPTION.
2. Before transmitting, monitor the channel and make sure it is clear.
3. For communications over short distances, press the [H/L] key and select low power (1 watt). Transmitting on 1 watt prolongs battery life, and should be selected whenever possible.
4. When receiving a signal, wait until the signal stops before transmitting. The transceiver cannot transmit and receive simultaneously.
5. Press the [PTT] (Push-To-Talk) switch to begin your transmission. To confirm transmission in progress the LCD indicator illuminates TX and the LED illuminates RED.
6. Hold the transceiver 1 inch from your mouth and speak slowly and clearly into the microphone.
7. When the transmission is finished release the [PTT] switch.

Channels

INT, USA & Canadian Modes

In compliance with worldwide license regulations the following version of HT640 are available:



Version A: INT, USA & Canadian modes

Version B, C & D: INT mode only

1. In the case of version A only; to change the channel set of the transceiver, hold down the [WX] key. The mode changes from USA to Canadian to International.
2. Refer to the marine channel charts in this booklet for allocated channels in each mode.

NOAA Weather Channels

(Applicable to version A model only)

1. To receive a weather channel, press the [WX] key. The transceiver enters into weather channel mode.
2. There are 10 weather channels. Use the  &  buttons to select the desired channel.
3. To exit from the weather channels press the [WX] key. The transceiver recalls the previous working channel.

Emergency Channels

To select the emergency channel, press the [16/9] button from any channel. Channel 16 appears on the display.

To recall the previous channel used, press the [16/9] button once again.

Channel 9



Channel 9 is used as a hailing channel for initial, non-emergency contact with other vessels. Hold down the [16/9] key for 1 second to select channel 9.

To recall the previous channel used, press the [16/9] button twice.

Monitor Channels

Press the blue monitor button on the top of the radio to defeat the squelch mute and release button to mute radio. A long press (radio will beep) will hold the squelch mute open until pressed again to cancel again to return to squelch mute.

Adjusting Squelch Threshold

Press the blue monitor button on the top of the radio and switch radio on. Use  &  buttons to adjust threshold (between 01 - 16). Press MEM to store the setting.

Channels

SIMPLEX / DUPLEX CHANNEL USE

Your transceiver has been factory programmed in accordance with FCC (USA), Industry Canada and International regulations. The mode of operation cannot be altered from simplex to duplex or vice versa. Simplex or duplex mode is automatically activated, depending on the channel and the channel set and whether USA, Canadian, or International mode is selected.

Refer to the channel charts listed on pages 22-24 of this user manual.

If you have a licence to use a specific simplex or semi-duplex channel, contact your dealer who may be able to programme your channel using the transceiver's private channel memory.

CHANNEL A/B INSTANT ACCESS

For your convenience, two user assigned channels can be programmed for instant access. If the [A/B] key is pressed and no channel A or B has been assigned, a short beep will be heard.

PROGRAMMING A/B INSTANT ACCESS BUTTONS

1. Hold down the [A/B] key and turn on the transceiver.
2. The letter A will appear on the display and dashes " _ _ " indicate that no channel has been designated channel A.
3. Press the [UP/DOWN] button until the desired channel number is displayed.
4. With the desired channel number displayed, press the [MEM] key once. The "A" will stop flashing, indicating that the displayed channel is now designated channel A.
5. Press the A / B button again. The letter "b" will appear on the display.
Repeat steps 2 through to 4.
6. Switch transceiver off and on to exit this mode and save changes. If you wish to clear instant access channels follow step 1 then press the [MEM] key. The "A" will flash. Now switch the transceiver off and on again.

Note: Should you later wish to delete any stored channels simply press "MEM" key whilst in A/B programming mode.



OPERATION OF A/B INSTANT ACCESS BUTTONS

Pressing the [A/B] button will toggle between A, B and the previous selected working channel. Channel A is represented by the "A" to the left of the channel number on the LCD, & channel B is represented by "B".

Note: Do not confuse this "A" with the one that is sometimes displayed to the right hand side of the channel number (in USA and Canadian modes)

Functions

The Scan Function

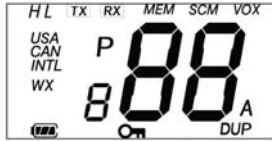
1. Select the desired channel to be scanned using the  &  buttons.
2. Press the [MEM] button to store the channel in the transceiver's memory. [MEM] is displayed on the LCD. This channel is now memorised to be scanned.
3. To add further channels, repeat steps 1 & 2.
4. To delete a channel from the transceiver's scan list, press the [MEM] button on a channel that displays the [MEM] icon until the icon disappears.
5. All channels programmed remain in the transceiver's scan memory, even if the power is switched off.
6. Adjust the squelch control until the white noise is eliminated.
7. To start scanning, press the [SCAN] key. The scan proceeds from the lowest to the highest programmed channel number & stops on channels when a transmission is received.
8. To stop the scan at any time, press the [SCAN] key again.



VOX (Voice Operated Transmit)

Press the [MEM] button & switch the transceiver on. The VOX symbol & a "0" will flash. "0" indicates VOX is switched off, 1 is for low sensitivity, 5 is for normal sensitivity, and 9 is for high sensitivity. Use the [UP/DOWN] button to select the desired level, press [MEM] to confirm, the transceiver is now set to VOX. To switch VOX off, go back into VOX programming mode by holding the [MEM] key whilst switching on. Press the UP/DOWN button until the vox level is "off" and press [MEM] to confirm.

In VOX mode the transceiver will react to your voice, and transmit automatically without you having to press the PTT button. There is always a slight delay for the electronic switching & consideration will need to be given. To get optimum performance from the VOX feature you should use a noise cancelling headset or earpiece microphone (see accessory options).

LCD Indicators



Indicator	Description
<i>H</i>	High power selected (5 Watts)
<i>L</i>	Low power (1 Watt).
TX	The Radio is Transmitting.
RX	The Radio is Receiving.
MEM	Indicated channel is memorised for scanning.
SCM	Scrambler mode enabled (version A & B only).
VOX	Voice operated transmit mode enabled.
USA	Indicates the channel set for USA.
CAN	Indicates the channel set for Canadian.
INTL	Indicates the channel set for International.
WX	NOAA weather channels selected (USA & Canadian waters only).
A	A ship-to-ship channel (in USA or Canadian mode).
	Battery life indicator.
	Indicates keypad is locked, excluding the PTT, H/L & LAMP buttons.
P	Private channel number selected.
DUP	Duplex channel selected (not simplex).

Optional Accessories

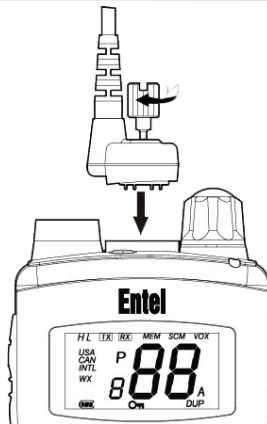
Attaching & Removing Accessories

To attach an accessory: Remove the accessory cover by unscrewing the locking screw anti-clockwise (leave cover attached or store in a safe place).

Attach accessory plug to the socket. Carefully tighten the locking screw clockwise until finger tight (do not tighten with a screwdriver etc).

To remove an accessory: Unscrew the locking screw of the accessory by hand in an anti-clockwise direction (carefully use a coin or screwdriver if too tight).

Ensure you re-fit the accessory cover so as to protect the socket.



Battery & Charger Options

CNB750E	Spare 1800mAh Lithium-Ion battery pack with rear clip
CLB750G	Spare 2000mAh Lithium Manganese non-rechargeable battery with rear clip.
CSAHT	1-way intelligent rapid charger, 110-230v
CSBHT	6-way intelligent, rapid charger, 110-230v
CCAHT-230	1-way trickle charger with 230V mains adapter
CCAHT-110	1-way trickle charger with 110V mains adapter
CCAHT-12	1-way trickle charger with cigar lighter lead, 12V DC operation

Carry Options

CFC750	HT64X soft leatherette case finished in black with carry strap
CLC752	HT642, HT648 heavy duty black leather case with strap & belt loop
CLC753	HT644 & HT649 heavy duty black leather case with strap & belt loop
CBH750	Spare spring loaded belt clip

Audio Accessory Options

CMP1/750	Compact medium duty speaker microphone with earpiece jack
CMP750	Heavy duty submersible speaker microphone
EHP9	D-shaped earpiece (plugs into CMP1/750 or CMP750 above)
EA12/750	D-shaped earpiece with in-line PTT/microphone & VOX*
EA15/750	Earpiece microphone with transparent acoustic tube & VOX*
EA19/750	D-shaped earpiece with boom microphone and in-line PTT & VOX*
EHP750	D-Shaped earpiece (connects directly to radio)
EPT40/750	Bone conductive earpiece microphone with PTT
CXR5/750	Bone conductive skull microphone with in-line PTT
CXR16/750	D-shaped earpiece and throat microphone with in-line PTT

Optional Accessories

CHP1/750	Light weight single earpiece headset with in-line PTT & VOX*
CHP750HS	Single earpiece ear defender headset with boom mic and in line PTT for hard hat & VOX*
CHP750HD	Double earpiece defender headset with boom mic and in line PTT for hard hat & VOX*
CHP750D	Double earpiece headband defender headset with boom mic and in line PTT & VOX*
CHP750BT	Bluetooth double earpiece headband defender headset with boom mic and ear cup PTT
CBH750	Spare spring loaded belt clip

*VOX = Voice Operated Transmit (hands free operation)

For complete up to date list of optional accessories visit www.entel.co.uk

Standard Features

Standard Features:

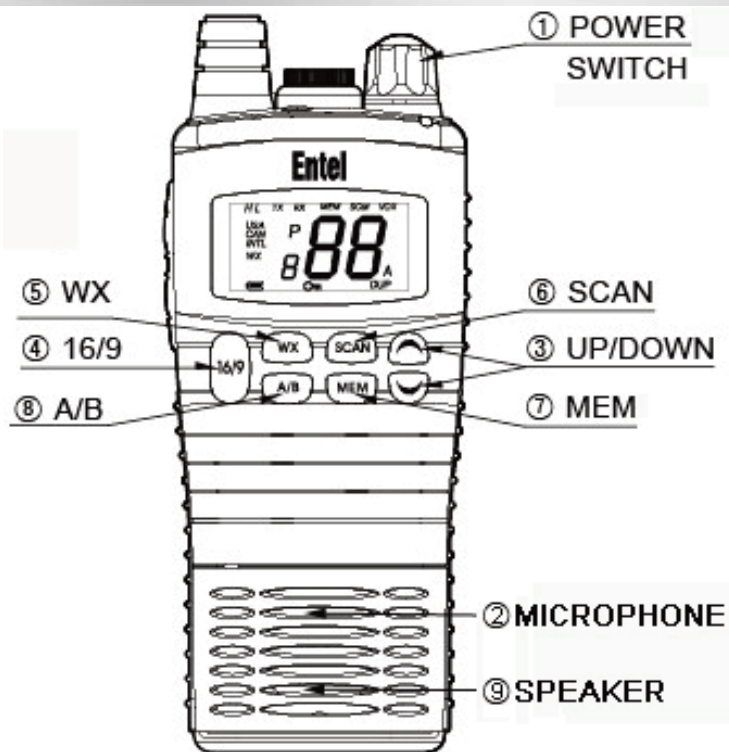
- Environmentally protected to IP68 i.e. submersible to 5 metres for up to 60 minutes.
- Robust design, exceeds MIL-STD-810C/D/E/F.
- LCD screen to display channel number & current settings \ status.
- 1800mAH Lithium-Ion battery for superior operational time.
- INT, USA, CAN channels.
- Full transmit power output 5 Watts.
- Exceptionally loud & clear audio .
- Ch 16 \ 9 shortcut button.
- WX shortcut button.
- Scan button.
- Monitor button.
- MEM button.
- Automatic power save to further increase operational time.
- Low battery alert indicates when the battery needs charging or replacing.

Dealer Programmable Features:

- Key lock button
- Prefixed minimum volume level and fixed bleep level

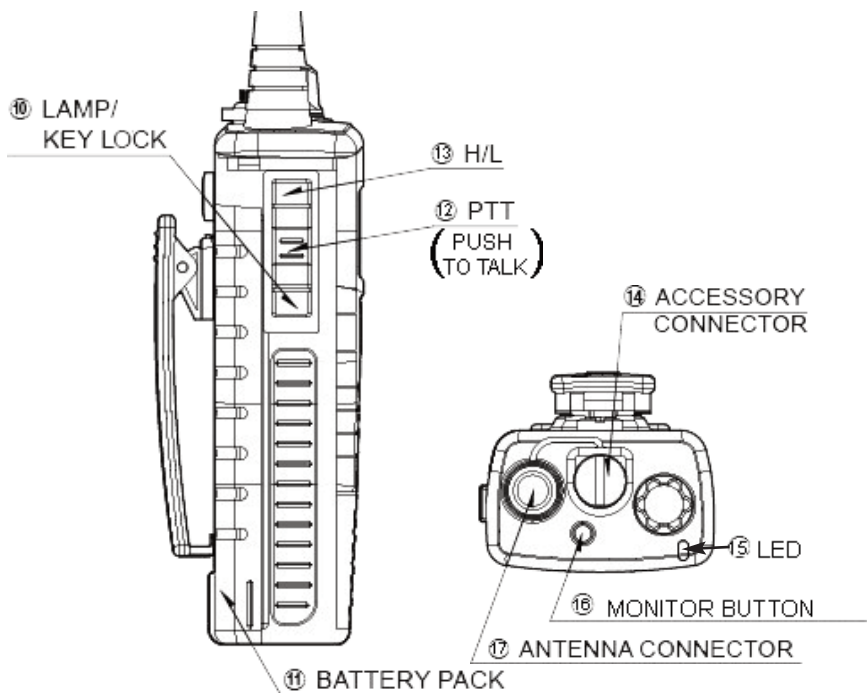


Controls



- 1 **Power & Volume Control:** Powers the radio on and off and controls the volume.
- 2 **The Microphone:** Internal condenser microphone
- 3 **Up / Down Buttons:** Press up / down buttons to change channel.
- 4 **16/9 Button:** A momentary press of the button selects channel 16 and a longer presselect channel 9.
- 5 **WX Button:** Immediately recalls the weather channels.
- 6 **Scan Button:** Starts / Stops scanning the programmed channels.
- 7 **The MEM Button:** Memorises a desired channel for scanning.
- 8 **The A/B Button:** Provides Instant access to preassigned channels (if programmed)
- 9 **Speaker:** The Radio's Speaker.

Controls



- 10 Lamp / Key lock Button:** Momentarily pressing this button illuminates the LCD display. Holding this button for over 1 second activates the key lock. To deactivate the key lock press & hold the button again until the lock removes.
- 11 The Radio's Battery Pack:** Rechargeable lithium-ion battery pack.
- 12 PTT (Push To Talk Switch):** Hold down to transmit, release to receive.
- 13 H/L Button:** Press and hold this button for 1 second to toggle between high and low power (1 & 5 Watts).
- 14 The Accessory Connector:** Used to attach any HT644 approved accessory.
- 15 LED Indicator:** Indicates the status of the radio:
 - RED Steady = Transmitting
 - RED Flashing slowly = Battery needs re-charging
 - GREEN Steady = Receiving
- 16 Monitor Button:** Press to monitor the channel without the squelch mute.
- 17 Antenna Connector:** Use to attach the antenna of the radio.

Glossary of Terms

Term	Description
Canadian Channels	Channels designated as defined and regulated by Industry Canada, (RIC), Marine Communications & Traffic Services.
Duplex	Transmit and receive on different frequencies.
Encryption	Scrambled audio for extra privacy
FM	Frequency Modulation.
International Channels	Channel designations as defined for use in international waters by the International Telecommunications Union (ITU)
Marina Channels	Special channels reserved for marinas located in selected European countries. These channels are pre-programmed in the transceiver as PI & P2.
Private Channels	Channels which are assigned by regulatory agencies governing VHF radio use for a specific region or country. These channels are prefixed with a "P" and can only be programmed into the transceiver by authorised dealers.
PTT	Press To Talk (Transmit)
RX	Receive
Simplex	Transmit and receive on the same frequency.
Squelch	To suppress background noise
TX	Transmit
Transceiver	A device that can transmit and receive
USA Channels	Channel designations as defined by the Federal Communications Commission (FCCVOX)
VOX	Voice Operated Transmit
VHF	Very High Frequency (30MHz to 300 MHz)

Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Transceiver not switching on	Battery needs charging or battery is exhausted	Charge the battery pack replace the battery pack
The scan key does not start the scan	No channels memorised (MEM) Squelch is not adjusted	Use the MEM key to enter desired channels into scan memory. Adjust the squelch to threshold or to the point where the white noise just disappears.
Cannot change any function	Key lock is switched on	Turn key lock off
The LED on the charger does not illuminate when charging	Defective battery or charger. Dirty terminal contact on battery or charger	Contact your dealer Clean contacts with dry clean cloth
No transmit or cannot select high power	Some channels are low power only Battery pack exhausted	Change to high power channel Charge / replace the battery
Transceiver transmits without pressing PTT button Buttons seem to work intermittently	VOX has been enabled	Hold MEM button for 2 secs, use UP or DOWN button & select "off" to turn VOX off

Channel Chart

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)
60A	X	X		S	160.075		U.S. Government only, Canadian Coast Guard-Pacific Coast, Commercial Fishing-East Coast
61			X	D	156.075	160.675	Public Correspondence (Marine Operator), Port operation, ship movement
62A		X		S	156.125		Pacific coast: Coast Guard; East Coast: Commercial fishing only
62			X	D	156.125	160.725	Public Correspondence (Marine Operator), Port operation, ship movement
63A	X			S	156.175		Port Operation and Commercial VTS in selected areas.
63			X	D	156.175	160.775	Public Correspondence (Marine Operator), Port operation, ship movement
64A	X	X		S	156.225		U.S. Government only, Canadian Commercial Fishing
64			X	D	156.225	160.825	Public Correspondence (Marine Operator), Port operation, ship movement
65A	X	X		S	156.275		Port Operations
65			X	D	156.275	160.875	Public Correspondence (Marine Operator), Port operation, ship movement
66A	X	X		S	156.325		Port Operations
66			X	D	156.325	160.925	Public Correspondence (Marine Operator), Port operation, ship movement
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 only, International: 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 fishing only, International: Port operations and Ship movement
74	X	X	X	S	156.725		US: Port Operations, Canada: Commercial fishing only fishing only, International: Port operations and Ship movement
77	X	X	X	S	156.875		Port Operations (Inter-ship only)
78A	X	X		S	156.925		Non-commercial (Recreational)
78			X	D	156.925	161.525	Public Correspondence (Marine Operator), Port operation, ship movement
79A	X	X		S	156.975		Commercial
79			X	D	156.975	161.575	Port operation and Ship movement
80A	X	X		S	157.025		Commercial
80			X	D	157.025	161.625	Port operation, ship movement
81A	X	X		S	157.075		U.S. Government only-Environmental protection operations.
81			X	D	157.075	161.675	Port operation, ship movement
82A	X	X		S	157.125		U.S. Government only, Canadian Coast Guard Only
82			X	D	157.125	161.725	Public Correspondence (Marine Operator), Port operation, ship movement
83A	X	X		S	157.175		U.S. Government only, Canadian Coast Guard Only
83			X	D	157.175	161.775	Public Correspondence (Marine Operator)
84A	X			S	157.225		Public Correspondence (Marine Operator)
84	X	X	X	D	157.225	161.825	Public Correspondence (Marine Operator)

Channel Chart

VHF MARINE CHANNEL CHART							
CH	U	C	I	S/D	TX	RX	CHANNEL USE
01A	X			S	156.050		Port Operation and Commercial VTS in selected areas
01		X	X	D	156.050	160.650	Public Correspondence (Marine Operator)
02		X	X	D	156.100	160.700	Public Correspondence (Marine Operator)
03A	X			S	156.150		US Government only, Coast Guard
03		X	X	D	156.150	160.750	Public Correspondence (Marine Operator)
04A		X		S	156.200		Pacific coast: Coast Guard, East Coast: Commercial fishing
04			X	D	156.200	160.800	Public Correspondence (Marine Operator), Port operation, ship movement
05A	X	X		S	156.250		Port operation, VTS in Seattle
05			X	D	156.250	160.850	Public Correspondence (Marine Operator), Port operation, ship movement
06	X	X	X	S	156.300		Inter-ship Safety
07A	X	X		S	156.350		Commercial
07			X	D	156.350	160.950	Public Correspondence (Marine Operator), Port operation, ship movement
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	X	S	156.750		Commercial, non-commercial, ship movement (1W)
16	X	X	X	S	156.800		International Distress, Safety and Calling
17	X	X	X	S	156.850		State Controlled (1W)
18A	X	X		S	156.900		Commercial
18			X	D	156.900	161.500	Port operation, ship movement
19A	X			S	156.950		US: Commercial
19A		X		S	156.950		Coast Guard
19			X	D	156.950	161.550	Port operation, ship movement
20A	X			S	157.000		Port Operation
20		X	X	D	157.000	161.600	Canadian Coast Guard Only, Interational: Port operation and shipment
21A	X	X		S	157.050		U.S. Government only, Canadian Coast Guard
21			X	D	157.050	161.650	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
22			X	D	157.100	161.700	Port operation, ship movement
23A	X			S	157.150		U.S. Government only
23		X	X	D	157.150	161.750	Public Correspondence (Marine Operator)
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)

Channel Chart

VHF MARINE CHANNEL CHART							
CH	U	C	I	S/D	TX	RX	CHANNEL USE
85A	X			S	157.275		Public correspondence (Marine Operator)
85	X	X	X	D	157.275	161.875	Public correspondence (Marine Operator)
86A	X			S	157.325		Public correspondence (Marine Operator)
86	X	X	X	D	157.325	161.925	Public correspondence (Marine Operator)
87A	X			S	157.375		Public correspondence (Marine Operator)
87	X	X	X	D	157.375	161.975	Public correspondence (Marine Operator)
88A	X			S	157.425		Commercial, Inter-ship Only
88		X	X	D	157.425	162.025	Public correspondence (ship-to-coast)
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)

Technical Specifications

GENERAL

Frequency Range	156 - 163.275MHz
Channel Spacing	25 kHz
Communication Method	Simplex
Antenna	High Efficiency Helical
Antenna Impedance	50 ohm
Power Supply Voltage	7.4V DC
Battery Life	8 Hours
Current Drain (nominal)	Standby 40mA; RX: 390 mA; 1.0W audio output (1kHz) TX: Less than 1 A at 2V, 0.7 A at 1V.
Duty Cycle	TX: 10%, RX 10%, Standby: 80%
Microphone	Internal condenser microphone
Operating Temperature	-20°C to 60°C

Technical Specifications

GENERAL

Weight	Height = 130mm (145mm including knobs);
	Width = 59.5mm (62mm including protrusions);
	Diameter = 37mm (41mm including battery protrusions)
Weight	Less than 300g.

TRANSMITTER

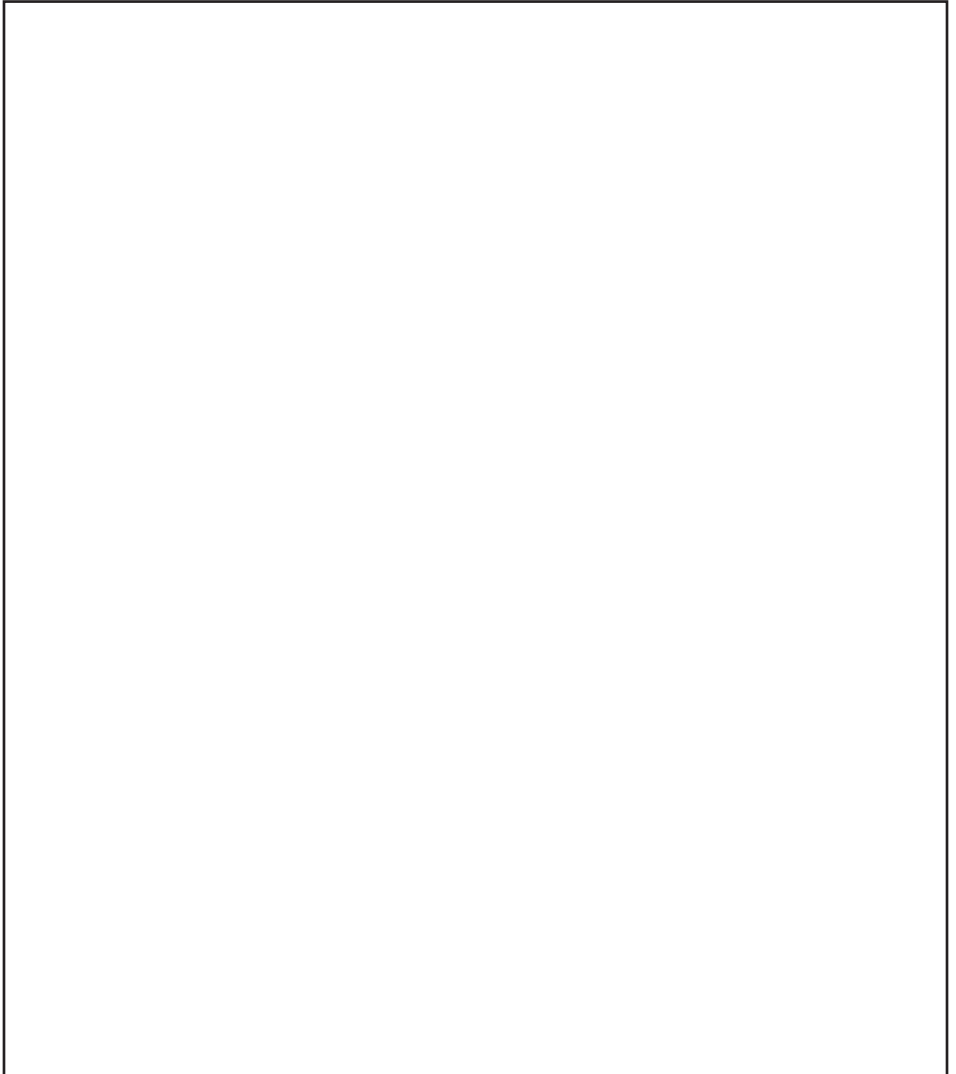
Frequency Range	156.025 - 157.425
Power Output	Selectable: HIGH = 5W, LOW = 1W
Modulation	16K0G3E
Oscillator Method	PLL
Frequency Stability	±2PPM
Maximum Deviation	±5 kHz
Audio Distortion	< 5% (1 kHz 60%)
Spurious Emissiong	-55db
Hum & Noise	-40 [dB]

RECEIVER

Frequency Range	156 - 163.275MHz
Receiver Type	Double Super Heterodyne type
Sensitivity	<0.25uV (12dB SINAD)
Frequency Stability	±2PPM
Spurious Rejection	-60 dB
Adjacent Channel Selectivity	-70 dB
Distortion	< 3% Typical
Hum & Noise	-40 dB
Audio Output	1W
Speaker Size	38 mm

Notes

Use this page to record important information, such as the serial number of your radio and any private channels programmed by your dealer.



Notes

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'the
professional's
choice'

<Intended Country Of Use>

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CE 0891 !

Registered Community Design Application 000810890

U.S. Design Patent Pending No. 23/182,829

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