# RT-2900 Marine Radio

**25/1 Watt VHF/FM**

## Owner's Manual


## OPERATOR WARNING

Lorenz requires the radio operator to meet the requirements for Radio Frequency Exposure. Unauthorized changes or modifications to this equipment may void compliance with ETSI Rule. Any changes or modification must approve in writing by Lorenz.

This equipment has been tested and licensed to comply with the limits for Class D Digital Marine Devices. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment can generate or radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications and human body. Never transmit before you make sure the antenna is properly located.

This device is only an aid to navigation. Its performance can be affected by many factors including equipment failure or defects, environmental condition and improper handling or use. It is the user's responsibility to exercise common prudence and navigational judgement, and this device should not be relied upon as a substitute for such prudence and judgement. Your Lorenz VHF radio generates and radiates radio frequency (RF) electromagnetic energy (EME). This equipment must be installed and operated in accordance with the instructions contained in this handbook. Failure to do so can result in personal injury and/or product malfunction.

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# 1 EQUIPMENT DESCRIPTION

## 1.1 INTRODUCTION

Congratulations on your purchase of **Lorenz** marine band radio. RT-2900 is a VHF DSC Base Station Radio with output power of 25/1 watt. It should be powered by a 13.8VDC power supply.

The radio can support DSC (Digital Selective Calling) operation with specially designed DSC unit. When being connected with GPS, it will display the position (longitude and latitude) of the vessel. Compact fist microphone makes for convenient operation of the equipment

Other features of the radio includes:

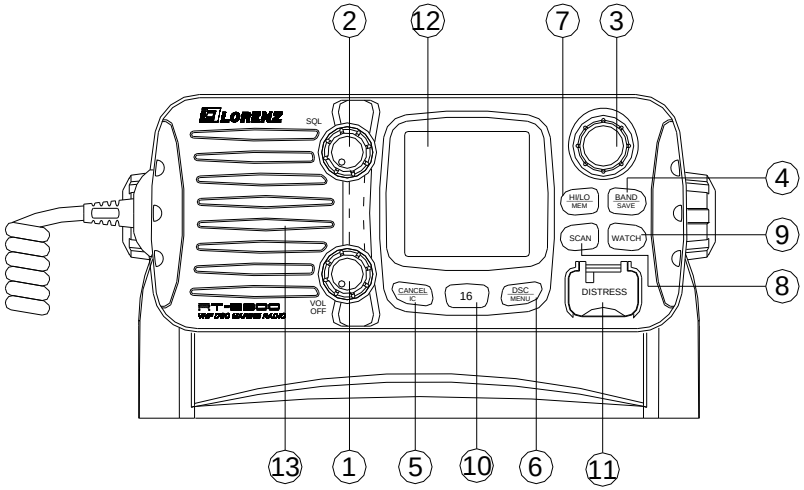
- Access to all available International channels (currently allocated).
- Allows memory all channels for quick recall and memory scan.
- Provides as many as 20 user programmable names with MMSI, and 20 individual calls for DSC communications.
- Rotary volume control with power on/off, rotary channel selector and rotary squelch adjustable knob give you more convenient operation of the radio.
- Outstanding performance of waterproof complying with Japanese Industry Standard level 7.
- 25 watts high output power allows you make contact with others in a long distance of marine communication; and 1 watt low power for short distance.
- Separate ***16*** button, for quick selection of the emergency call on CH16.
- Adjustable brightness of backlit for good visibility of the large LCD in various circumstance.
- External interface easy to connect to GPS and external speaker.
- Mounting gimbal for firm and reliable location of your base station in difference condition.

## 1.2 ETSI INFORMATION

ETSI (European Telecommunications Standard Institute) has stipulated the specific requirements **(EN 301 025-1/2/3**) on marine radio with **class D DSC** feature, For use on non-SOLAS vessels.

# 2 CONTROLS AND LCD DISPLAY

## 2.1 BASE STATION (PANEL)




① Volume and Power On/Off — 0-270°rotary control Knob. Turn clockwise to power on. Continue to turn until a comfortable audio level.

② Squelch — Use this knob to set the squelch threshold, which cuts off the receiver when the signal is too week for reception of anything but noise.

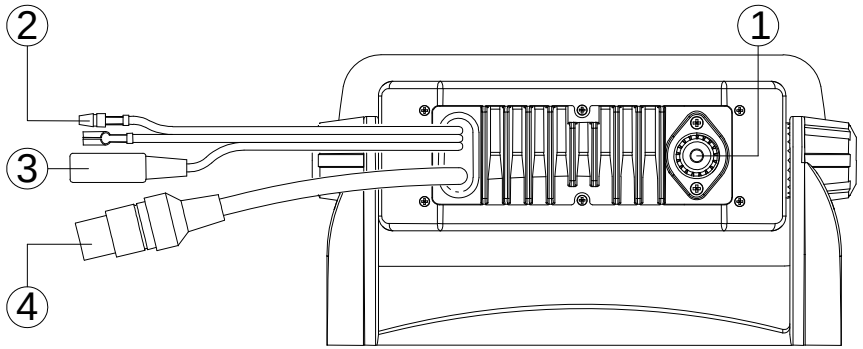
③ CH/enter — Rotary encoder (no stop) with momentary push Rotate this knob to change the current number and change values in menu mode or during programming. Press the knob to enter values

④ Band / Save — Select band (USA. INT) and set memory channels

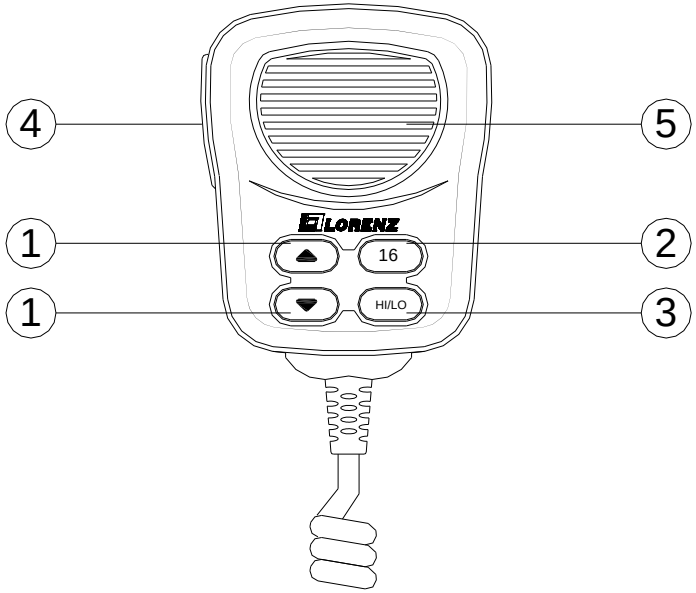
⑤ Cancel — The key to cancel last selection or change without saving. It allows step back one level on menu mode. It cancels DSC Distress calls & auto-retransmission of DISTRESS calls.

| | | |
|---|---|---|
| ⑥ | DSC /Menu | Use this knob to enter Menu Setup or DSC Call Menu . Call Mode is used for making DSC Calls. Menu Mode is used to setup the radio. |
| ⑦ | Hi/Low/Mem | Press and release ***HI/LO*** button to toggle between 25 watt power output and 1 watt output. "Hi" or "Lo" icon appears on LCD display to indicate setting<br>Hold the key select memory channels mode. |
| ⑧ | Scan | Start and stop normal or priority scan and memory channels or priority channels scan. |
| ⑨ | Watch | Start dual watch or tri-watch, Stop dual watch or tri-watch. |
| ⑩ | 16 | Press and release ***16*** key select channel 16 first;<br>Press ***16*** key to quit all other modes and to into the priority channel |
| ⑪ | DISTRESS | This key is used to send a signal of distress in case of emergency. See DSC Operation for details of sending the call. This key is cover by a spring cover.<br>The Distress Function or any other transmitted DSC function does not work unless a user's MMSI has been entered. |
| ⑫ | LCD: | Large LCD (39mmx39mm) with viewable area of graph dot matrix makes it easy to be read. |
| ⑬ | Built-in Speaker | Guarantee a clear ring and voice communication |

## 2.2 BASE STATION (REAR)



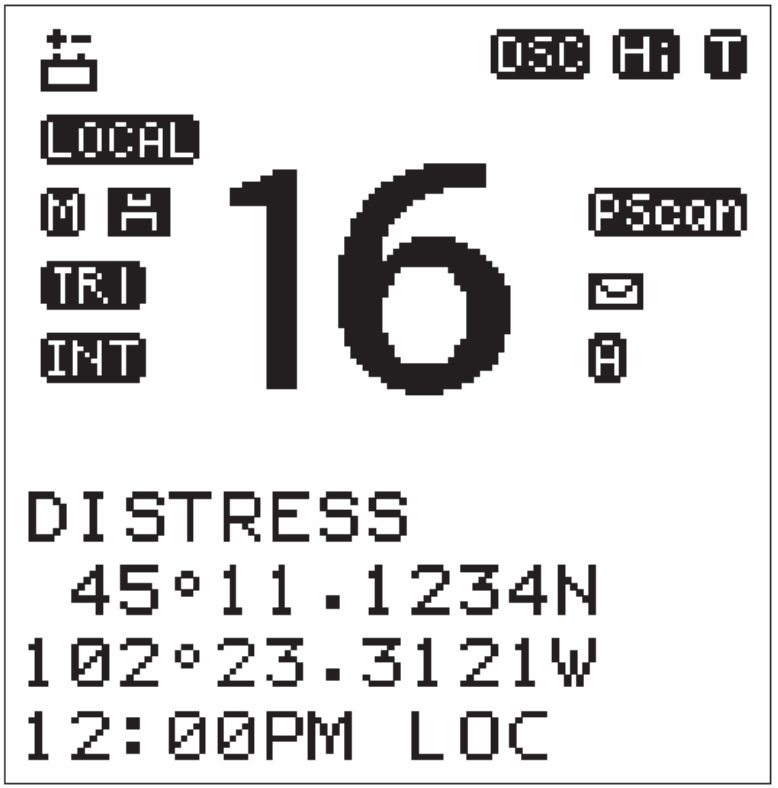

| | |
|---|---|
| ① Antenna Socket | Connect a suitable antenna to your marine VHF radio to get a satisfying communication. |
| ② Power Source | Connect the radio to a 13.8 VDC power source. |
| ③ External Speaker Jack | If need be, you can also use this cable to connect an external speaker. |
| ④ GPS Connector | Connect the radio to a GPS receiver to acquire the position and time information of your vessel |




## 2.3 HANDSET

| | |
|---|---|
| ① Channel Up/ Down | Press and release to change channel. |
| ② 16 | Press and release ***16*** key to select channel 16 first; Press ***16*** key to quit all other modes and to into the priority channel. |
| ③ Hi/Low: | Press and release ***HI/LO*** button to toggle between 25 watt power output and 1 watt output. The "Hi" or "Lo" icon appears on LCD display to indicate the setting. |
| ④ PTT: | Push to enable VHF communication through the 25/1-Watt transmitter. |
| ⑤ Internal Microphone: | Well receive your voice information and ensure a reliable communication. |

## 2.4 LCD DISPLAY

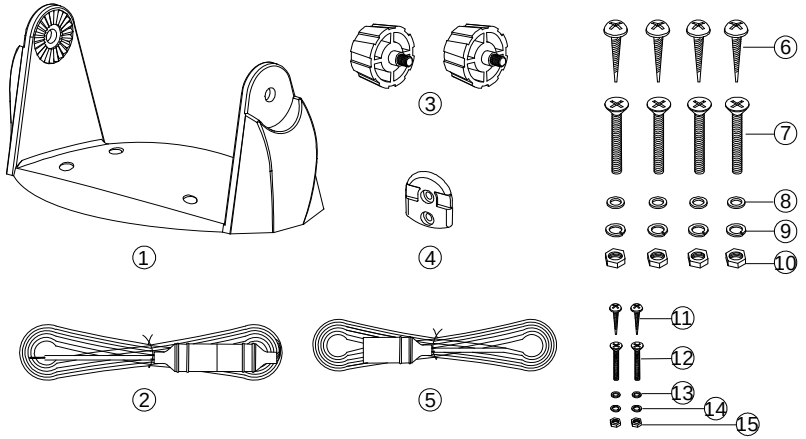


# 3 INSTALLATION

## 3.1 SUPPLIED ACCESSORIES

Manufacturer supplies you the following accessories as soon as you purchase this RT-2900 marine radio:

① Mounting Gimbal (1 pc)
② Power Supply Cable and External Speaker Connection Cable (1 set)
③ Mounting Knob (2 pcs)
④ Wall Hanger (1 pc)
⑤ GPS Connection Cable (1 set)
⑥ Self-tapping Screw for Fixing Mounting Gimbal (4 pcs)
⑦ Flat Screw for Fixing Mounting Gimbal (4 pcs)
⑧ Plain Washer (4 pcs)
⑨ Spring Washer (4 pcs)
⑩ Nut (4 pcs)
Self-tapping Screw for Fixing Wall Hanger (2 pcs)
Flat Screw for Fixing Wall Hanger (2 pcs)
Plain Washer (2 pcs)
Spring Washer (2 pcs)
⑮ Nut (2 pcs)




## 3.2 LOCATION

To more conveniently and efficiently use your marine radio, find a mounting location that:

- Is far enough from any devices like devices to avoid any interference caused by the speaker magnet in your radio during their operation;
- Provides accessibility to the front panel controls;
- Allows connection to a power supply and an antenna;
- Has free space nearby for installation of a handset hanger;
- Where the antenna can be mounted at least 3 feet from radio.

## 3.3 CONNECTIONS

POWER SUPPLY

You radio should be powered by a 13.8VDC power supply. Red cable is for positive pole and the thicker black one is for negative pole.

EXTERNAL SPEAKER

If needed, you can connect your radio to an external speaker with the supplied connection cable. White cable is for positive pole and the thinner black one is for negative pole.

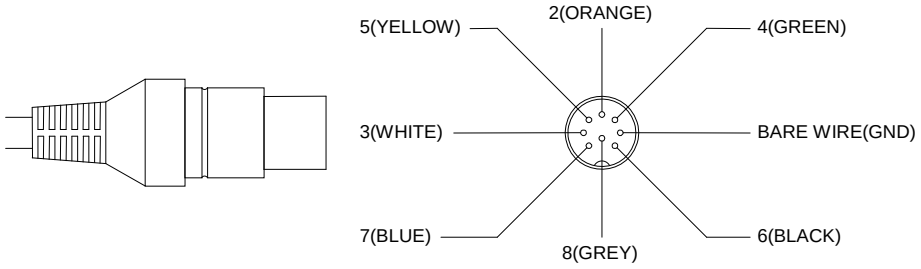
GPS EQUIPMENT

When your marine radio RT-2900 is connected to a GPS equipment, it can obtain the information of both its current location (longitude and latitude) and the local GMT. (“+” yellow, “-“ green)

GPS CABLE

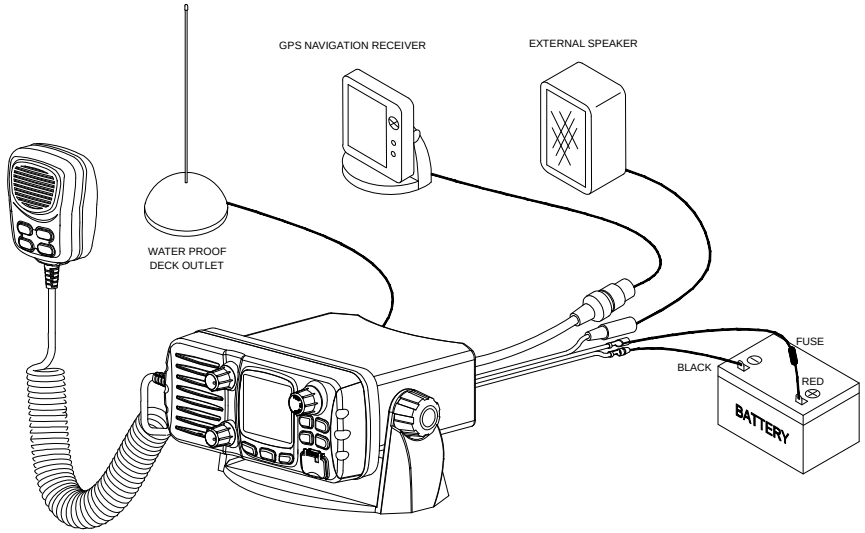
NMEA IN (+) from GPS navigation receiver, pin5. Yellow.
NMEA IN (-) from GPS navigation receiver, pin4. Green.
NMEA OUT(+) ,Pin2. Orange
NMEA OUT(-) ,Pin6. Black
NEMA 0183 Version (1.5 to 3.0) input Sentences:
The sentences GLL, GGA, RMS, GNS shall be recognized.

Note: Never short wires. This may lead to malfunctions.
Connecting round plug to radio and wires yellow and green to GPS navigation receiver.



ANTENNA

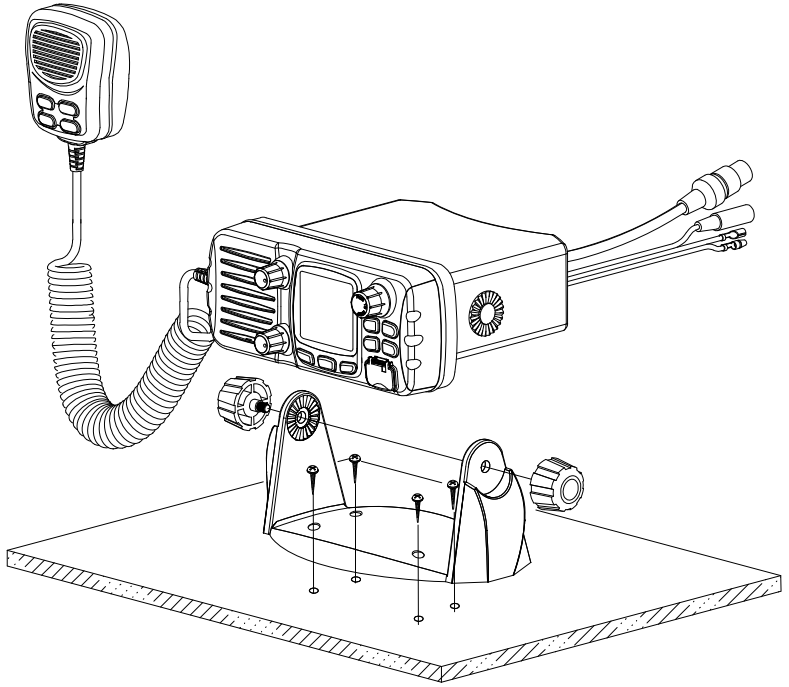
A very important part for the performance of any communication system is a suitable antenna. Consult your dealer about antennas and ask them to help to mount your radio.




### 3.4 MOUNTING THE RADIO

Mount the radio on your vessel:

1. Find a appropriate location defined in section 3.2;
2. Place the mounting bracket on the location surface, use a pencil to mark the location of four holes where the fixing screws are to go into;
3. ***Caution: Be careful tot to drill through the mounting surface.***
4. Remove the bracket, drill four holes smaller than the screw diameter, then re-place the mounting bracket on the surface aligning the drilled holes;
5. Insert the four fixing screws and secure the bracket to mounting surface using the supplied bolts, spring washers, plain washers and nuts;
6. ***Caution: if you can not reach behind the mounting surface to attach the nut on the bolts, use the supplied self-tapping screws to fasten the bracket.***
7. Insert the four fixing screws and fasten them with a Philip screw driver with attention not to screw too tightly;
8. Mount the base station onto the bracket with notice of the matching of the protuberances on the both inner side of the bracket and the pits on the two sides of the base station (the selectable pits on the sides of the radio allow you adjust the direction of the radio face to satisfy your easy-to-read-and-use, $15^0$ for each rotation and totally $45^0$ tolerance);
9. Attach the supplied mounting knobs from the two sides of the bracket to fixing the base station securely.

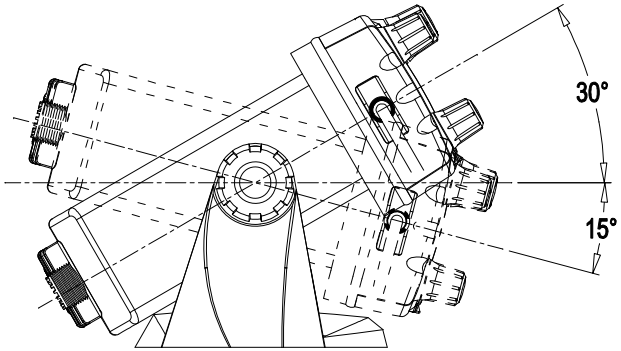


10. ***Caution: Keep the radio and handset at least 1 meter away from any magnetic devices such as compass on your vessel.***

The supplied universal mounting bracket allows you to mount your base station from overhead or on dashboard with a big scope of angle as many as $45^0$.

Change the angle after installation:

11. Loosen the mounting knob at the sides of gimbal first.
12. Then adjust the base station to an appropriate direction with matching of the protuberances on the inner sides of gimbal and pits on the outer sides of base station.
13. Tighten the knob to secure.



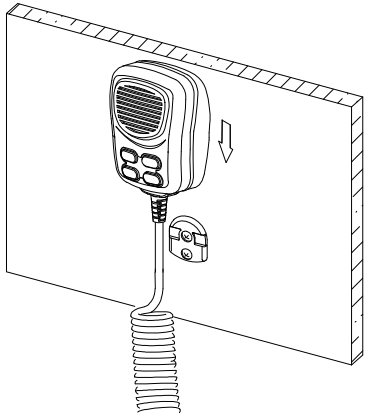

### 3.5 ANTENNA MOUNTING/THE EME EXPOSURE

For optimal radio performance and minimal human exposure to radio frequency electromagnetic energy, make sure the antenna is:

- Connected to the radio before transmitting;
- Properly mounted;
- Locate where it will be away from people:
- Locate at least three feet (91 cm) from the Base Station transceiver and Handsets;
- Use standard type of PL259 connector

### 3.6 MOUNTING THE HANDSET

Find a mounting location near the base station to mount the wall hanger for handset. The distance between the base station and the wall hanger should be less than the length of the handset cable.



## 4. BASIC OPERATION

### 4.1 TRANSMISSION AND RECEPTION

1 ***CAUTION: Transmitting without an antenna may damage the radio.***

2 After the radio has been installed, make sure of the power supply and antenna being properly connected.

3 To rotate the ***VOLUME/POWER*** knob clockwise turn on the radio and select a comfortable volume level.

4 To turn the ***SQUELCH*** knob clockwise until the background noise disappears.

5 Rotate ***CH*** knob to select channel

6 Press Hi/Lo key to select high power or Lowe power.

7 Press the ***PTT*** (Push-To-Talk) button on the handset to make the radio into transmission mode. the T indicator on LCD is displayed.

8 Speak clearly in a normal voice into the microphone.

9 once the transmission is finished, release the ***PTT*** button. The radio is at receive mode, icon R appear on screen.

### 4.2. BAND SWITCH

#### 4.2.1 USA AND INT MODE

1 Press the ***BAND/SAVE*** button, to switch the operational channel band (USA & INT).

2 The icon USA will be displayed on the LCD for USA mode, The icon INT will be displayed on the LCD for INTL mode Successive press and release toggles between USA and INT band.

#### 4.2.2 MEMO (FAV) MODE

Press and hold the ***HI/LO/MEM*** button while in normal operation mode to enter Mem mode, icon M indicators appear on LCD.
On the Mem Mode rotate the ***CH*** knob displays only the channels that you have saved to memory, which enables you to easily use your favorite channels while bypassing unwanted or seldom- used channels during a scan.
While in Mem Mode:
Press and release the ***SCAN*** key to start Memory scan mode.
Press and release the ***SCAN*** key to stop Memory scan mode.

### 4.3 SAVE MEMORY (FAV) CHANNELS

You can store all band channels as favorite channel.

Program the FAV channel and store Process as follow:

1 At normal mode, tune to the desired channel and then press and hold the ***BAND/SAVE*** key to save it as Favorite channel. The icon will be turned on for indication that channel be saved in FAV list.

2 Then tune to next desired channel and repeat the keystroke sequences till all desired channels be programmed / saved.

3 Delete the channel from the FAV list at Normal mode. Select the target channel with icon ON. Press and hold the ***BAND/SAVE*** key till the icon turn OFF. The target channel will then be deleted out from the FAV list. Repeat the keystroke operation for those unwanted channels.

4 If no channel has been programmed, an error beep occurs with indicate error message.

### 4.4 TRANSMIT TIME-OUT TIMER (TOT)

When the ***PTT*** button on the microphone is held down, transmit time is limited to 5 minutes. This will avoid unintentional transmissions. About 10 seconds before automatic transmitter shutdown, a warning beep will be heard from the speaker(s). The transceiver will automatically go to receive mode. Before transmitting again, the ***PTT*** button must be released and then pressed again.

### 4.5 SCAN

Scanning is an efficient way to locate signals quickly over a wide frequency range.
The transceiver has 4 Scan mode available: All scan, FAV CH scan, Priority scan, Priority FAV CH scan.

1 Default is normal all scan ***(1.2.3.4…)***.

2 Press and hold ***SCAN*** Key over 3sec, the Priority scan icon ***(1,16,2,16,3,16…)*** will be selected. Pscan mode will be appear on LCD Press and hold ***SCAN*** key over 3sec to turn it back to normal scan, the scan mode icon will be display.

During the ***SCAN*** modes:

3 Press ***SCAN*** key again will terminate the scan operation and stop at the current channel.

4 Press ***CANCEL*** key will also terminate the scan function and state at the current channel.
It also can be to cancel by ***16*** or ***PTT***.

### 4.6 WATCH

#### 4.6.1 DUAL WATCH

Press ***WATCH*** key to activate the DUAL WATCH mode. Monitor the current channel and Ch 16 in cycle. Icon DW will appear on the LCD.

#### 4.6.2 TRI-WATCH

Press and hold ***WATCH*** key to activate the TRI WATCH mode. Monitor the current channel, CH 16 and CH 9 in cycle. Icon TRI will be turn ON
To quit the mode, press ***WATCH***, ***16***, ***CANCEL*** key,
Press ***PTT*** key to TX mode of current channel

### 4.7 POSITION INDICATION

Your transceiver can display the position of the vessel's (longitude and latitude) as well as time and date information, if connected to a GPS receiver; if no GPS equipment to be connected,an alert tone of 10 sec duration witch can cancelled By any button is sounded at 4 hour intervals to encourage manual input of positional data . Once no manual input is made for 23.5 hours, GPS disappears from the screen, the position data transmitted goes to 9's and all the time data goes to 8's.

**DISTRESS**
**23°20.1234 N**
**100°15.1002 E**
**08:10PM LOC**

# 5 DIGITAL SELECTIVE CALLING

## 5.1 GENERAL

DSC (Digital Selective Calling) is a semi-automated method of establishing a radio call, it has been designated by the International Maritime Organization (IMO) as an international standard for establishing VHF, MF and HF radio calls. It had also been designated part of the Global Maritime Distress and Safety System (GMDSS). It is planed that DSC will eventually replace aural watches on distress frequencies and will be used to announce routine and urgent maritime safety information broadcasts. This new service will also allow mariners to initiate or receive distress, urgency, safety and routine calls to or from another vessel equipped with a DSC transceiver.

### 5.1.1 MARITIME MOBILE SERVICE LDENTITY

An MMIS is a nine-digit number used on Marine Transceiver capable of using Digital Selective Calling (DSC). This number is used like a telephone number to selectively call other vessels. Refer to section 6.12 (USER MMSI ENTRY).

### 5.1.2 HOW CAN I OBTAIN A MMSI ASSIGNMENT?

Contact your dealer or LORENZ

**WARNING**

This radio is designed to generate a digital maritime distress and safety call to facilitate search and rescue. To be effective as a safety device, this equipment must be used only within communication range of a shore –based VHF marine channel 70 distress and safety watch system. The range of signal may very but under normal conditions should be approximately 20 nautical miles.

## 5.2 DSC CALL TYPES

Press the ***DSC/MENU*** key to pop up the menu for user to select the DSC call type to send. Note that only four calls can be shown at any one time on the screen.

Press **+ /–** or rotate the ***CH*** knob scroll up and down the call types until the cursor is positioned at the desired option.

Press the ***CH*** key the call types are:

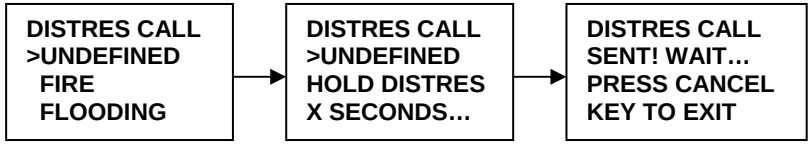
| Call Type | Description |
|---|---|
| *LAST CALL* | Recall last call no matter what type of call received at last. |
| *NEW CAL*L | Make a new call, by inputting the MMSI or pick up from the list max 20 |
| *GROUP* | Sends transmissions that are only received by radios that share a common group MMSI number, up to 3 group MMSI numbers can be stored and call. |
| *ALL SHIPS* | Make an Urgency, Safety or Distress call to all ships. A re-confirmation screen follows the priority selection of Urgency, Safety or Distress. Such call will be sent out when assistance need but the situation not is so serious enough for a Distress Call. Urgency call is made when assistance required but not life endanger while Safety call is for advisory alert. |
| *DISTRESS* | Distress call sends out the position and time information from the input NMEA data along with your MMSI number. This digital information lets other ships and shore equipped with appropriate DSC equipment know where you are and that you are in a distress situation, except immediate help is needed, never use the distress call. |
| *CALL LOG* | Allow a review of all stored Calls by number and time of call. An individual call type can be placed to the selected MMSI/NAME in the LOG. The LOG maintains all received call types except DISTRESS calls. The call at the end of the list is automatically erased. The earliest call stored at the end of the list. There is 20 calls could be stored. |
| *DISTRESS LOG* | Allow a review of all stored Distress calls by number and time of call. An individual call type can be placed to the selected MMSI / NAME in the LOG. The call at the end of the list is automatically erased. The earliest call stored at the end of the list. There is also 10 calls could be stored. |
| *POS REQUEST* | The option enables you to request GPS position information from any vessel for which an MMSI number is known, such request can pick up from buddy list. |
| *EXIT* | quit the menu mode. |

### 5.2.1 SENDING A DISTRESS CALL

**Note: Only having a MMSI code of your radio and DSC enable, can you initiate a DSC transmission? To enter the MMSI code see 6.9.1.**

1. Open the red cover labeled DISTRESS.
2. Press the ***DISTRESS*** key momentarily**.**

*The Text area of the display reconfigures to show the Nature of Distress menu.*

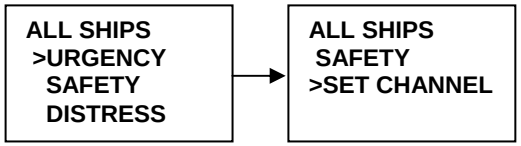



3. If time is available, rotate the ***CH*** knob to select the Nature of Distress, *the default are "UNDEFINED".*
4. Hold down the ***DISTRESS*** key for more than 3 seconds until you see the distress call sent message on the screen. The whole display screen to flash and beep loudly.
5. If ***DISTRESS*** key is released before 3 seconds, the initiation of distress call is not taken into effect and If button is pressed for more than 3 seconds, Distress call is sent whether channel 70 is busy or not. When Distress is sent, the acoustic alarm goes to a continuous tone until acknowledgement received or the Distress call is cancelled.
6. during the distress call sequence, the radio simultaneously watches Channel 70 for a DSC acknowledgement and Channel 16.
7. when the distress call is acknowledged, the acoustic alarm stops and the radio returns to normal operation on channel 16, with high power relay to the connected station via the microphone
8. If no acknowledgement is received, the unit retransmits the Distress call at random intervals of 3.5 to 4.5 minutes until a response is received or the call is manually cancelled, by pressing ***CANCEL*** key for twice

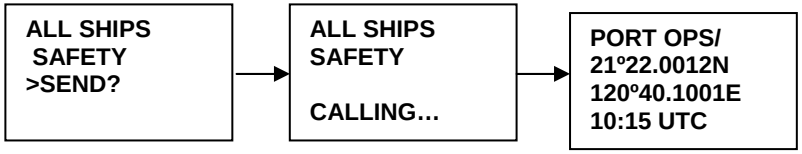
### 5.2.2 SEND AN ALL SHIPS CALL

1. Press ***DSC /*MENU** key. Rotate the ***CH*** knob to select “ALL SHIPS”. Press the ***CH*** knob to enter ALL SHIPS. The All Ships menu displays the categories from which you can select

**Caution:** Keep the radio and handset at least 1 meter away from any magnetic device such as compass on your vessel.




2. Rotate the ***CH*** knob to select: SAFETY, press the ***CH*** knob to enter All Ships Safety sends

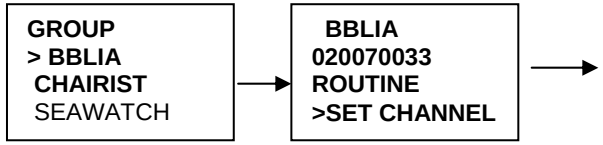


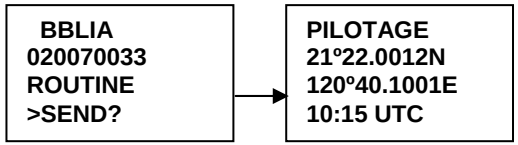

3. Rotate the ***CH*** knob to select the working channel; or press ***16*** key to quit.
4. Press again and release the ***CH*** knob to advance the screen if send the call.
5. Press again and release the ***CH*** knob to sending all ships safety call.
6. *Once the call is sent, the text area of the display momentarily shows the Calling All Ships message. And then the radio returns to normal VHF operation on the designated channel. Press **PTT** to talk.*

### 5.2.3 SEND A GROUP CALL

This feature allows the user to contact a group of specific vessels using DSC and to automatically switch to a desired channel. Before sending a GROUP call, you must be set the GROUP MMSI

1. From the DSC/MENU select the GROUP CALL item. Press the ***CH*** key *the screen displays the names of your groups.*




2. Select the group that you want to call. Then select the channel Press the ***CH*** knob to send a group call, *once the call is sent, the Text area of the display momentarily shows the Calling group message.*
3. *After the GROUP CALL is transmitted, the radio will return to normal VHF with the designated channel.*
4. *Press the **PTT** to start talk.*

## 5.2.4 MAKE A ROUTINE CALL (INDIVIDUAL)

You can make an individual call, either to a ship or to a boast station.

**5.2.4.1 MANUALLY SENDING AN INDIVIDUAL CALL**

1. Press ***DSC*** **/MENU** to DSC mode, then select "NEW CALL". Press the ***CH*** knob the arrow is pointing to **<ROUTINE>**


2. Rotate the ***CH*** knob to select: SAFETY, press the ***CH*** knob the arrow is pointing to **<MANUAL>**
3. Press the ***CH*** knob again access manual enter ID screen, enter the MMSI number using the ***CH*** knob, when MMSI entry is complete, press the ***CH*** knob to accept the selection
4 Then rotate the ***CH*** knob to select the working channel and press the ***CH*** knob to accept select.

***(Only in the case of a call to a ship, it is permitted to enter a talk channel; a call to a coast station, the coast station will specify the channel to talk on in its acknowledgement.)***

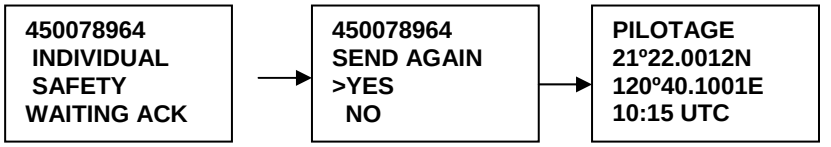
5 The radio summarizes the call details and ask for confirmation to send the call (send?).

6 Press the ***CH*** knob again to send the call. The radio goes to CH 70 and the icon-T is displayed on the screen while the DSC call is being sent, then LCD display a waiting acknowledgment.


7 If the call is acknowledged (ACK), press ***PTT*** to talk

8 If the call does not get with in 30 seconds, the radio prompts you to resend the call.

9 If you do nothing for 5 minutes, the individual call cancelled and the radio revert to the original channel.




**5.2.4.2 SENDING AN INDIVIDUAL CALL (MMSI STORED IN BUDDY LIST)**

1 Press ***DSC/MENU*** to DSC mode, then select "NEW CALL". And next select one of categories from new call menu. Press the ***CH*** knob, the arrow is pointing to **<MANUAL>**

2 Rotate the ***CH*** knob select the person of the Buddy list that you want to call. The procedures are as same as manual send an individual call.

**5.2.4.3 ACKNOWLEDGEMENT OF AN INDIVIDUAL INCOMING CALL**

The EUR requires the operator to manually send an acknowledgement to the requesting radio. Press ***CH*** knob to send an acknowledgement or ***CANCEL*** key to cancel.

**5.2.5 LAST CALL (RECALL THE MOST RECENT INCOMING CALL)**

This facility also is useful and is used frequently as routing individual call

1 Press the ***DSC*** / ***Menu*** key to enter the DSC mode LAST CALL will be pointed, press **CH** knob to display the detail information of the last call

2 Select the working channel for individual call and press **CH** knob. The radio summarizes the call details and ask for confirmation to send the call (send?). Press ***CH*** knob to send the call other operation as same as the section 5.2.4.1

**5.2.6 SEND AN INDIVIDUAL CALL USING THE CALL LOG**

The CALL LOG contains the contact details for the 20 most recent incoming calls, so you call any of them again quickly

1 Press the ***DSC / Menu*** key to enter the DSC mode, select CALL LOG, press ***up/down*** key to scroll for previous call.

2 Press the ***CH*** knob to conform the choice then select "CALL BACK" to allow sending an individual ways to make the call in 5.2.4.1

**5.2.7 SEND AN INDIVIDUAL CALL USING THE DISTRESS LOG**

Total max.10 distress call data could be stored; the oldest one will be erased. The feature is similar to CALL LOG function, but select the caller from the Distress Log. So you call any of them quickly, according to the normal individual call procedures to make the call reference 5.2.4.1

**5. 2.8 POS REQUEST AND POS REPLY**

**5. 2.8.1 POS REQUEST (REQUEST THE LL POSITION OF A BUDDY)**

The option enables you to request GPS position information from any vessel for which an MMSI number is known.

1 Select the POS REQUEST on the DSC Menu, press the ***CH*** knob to enter the buddy list, select the one for position information.

2 The Call will be initiate and same as individual call procedures. See 5.2.4.1

**5.2.8.2 POS REPLY**

The position reply can send your position to another radio with this feature. Your radio must have an operating GPS receiver connected to be used to send to the position.

POS reply can manually send your position or do it automatic t which depending upon on your setting the set

On the manual reply, operation procedures as follow:

1 when you received POS request call, An alarm (pi-pi) sounds, LCD displays as follow:

2 Press the ***CH*** knob to transmit your own ships' position and time information

3 Press ***CANCEL*** to record the received information, then the screen goes back to default.

**5.3. RECEIVING A DSC CALL**

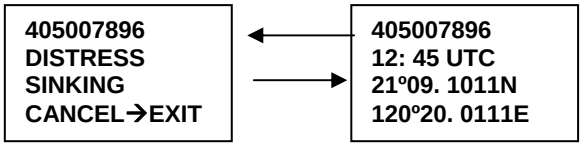
When a DSC call is received, the radio automatically responds based on the type of call. The information displayed on the LCD varies depending upon the call type. See chart below.

**5.3.1 RECEIVING DISTRESS CALL**

1 When a distress call is received, the radio automatically tunes to channel 16, and the Distress Alarm Tone sounds. The call data is stored in the distress Log and able to output to the NMEA port for external chart-plotter. Pressing any key disables the alarm.

2 When position data is included within the signal, it is displayed in the Text Area of the LCD. When no position data is included within the signal, the message "99'99.999X 99'99.999Y 88:88" is displayed in the Text Area of the LCD.

3 You must continue to monitor channel 16 as a coast station may require assistance in any rescue attempt

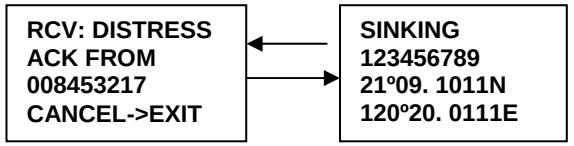



**5.3.2 RECEIVING A DISTRESS ACK SEND FROM A COAST STATION**

1 When a Distress Relay Call is received, the Base Station automatically tunes to Channel 16, and the Distress Alarm Tone sounds. Pressing any key disables the alarm.

When position data is included within the signal, it is displayed in the Text Area of the LCD. The call data is stored in the distress log and output to the NMEA port for external Chart-plotter.

2 You must continue to monitor channel 16 as a coast station may require assistance in any rescue attempt

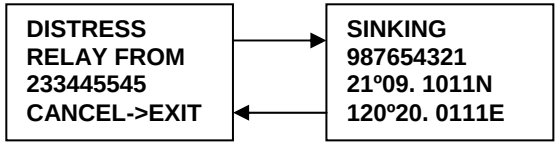



**5.3.3 RECEIVING A DISTRESS RELAY CALL**

1 When a Distress Relay Call is received, the Base Station automatically tunes to Channel 16, and the Distress Alarm Tone sounds. Pressing any key disables the alarm. The call data is stored in the distress log and output to the NMEA.

When position data is included within the signal, it is displayed in the Text Area of the LCD port for external chart-plotter.

2 You must continue to monitor channel 16 as a coast station may require assistance in any rescue attempt

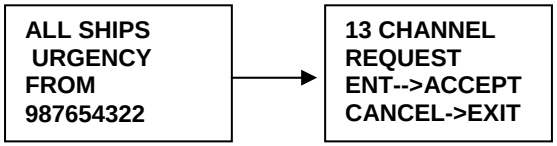



**5.3.4 RECEIVING AN ALL SHIPS CALL**

1 When an All Ships Call is received, the Alarm Tone Sounds, the radio manually tune to the designated Channel, and press any key to disable the alarm.

2 You must continue to monitor the channel so as to receiver the voice communication.

3 The call data is stored in the call log

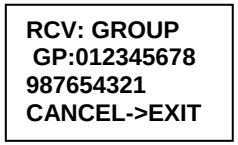



### 5.3.5 RECEIVING AN GROUP CALL

1 When an group Call is received, the Alarm Tone Sounds, the radio automatically tune to the designated Channel, and Press any key to disable the alarm.

2 Monitor the traffic channel for an announcement from the calling ship.

3 The call data is stored in the CALL LOG




### 5.3.6 RECEIVING AN INDIVIDUAL CALL

1 When an Individual call is received, the Alarm Tone Sounds. The radio manually tunes to the channel designated in the DSC signal,

2 The MMSI contained within the signal are displayed on the Text Area of the display. If the MMSI correlates to an MMSI stored in the Buddy List, the corresponding name is displayed in place of the MMSI.

3 The DSC signal data is stored in the Call Log.

### 5.3.7 RECEIVING AN "POSITION Reply" CALL

1 When "Position Reply" received, the Alert tone sound and the "POSITION ACK" message on 1st line and display the sender GPS data.

2 The time & position could be stored and able to output to the NMEA port for external Chart-plotter.

### 5.3.8 RECEIVING A GEOGRAPHIC AREA CALL

A GEOGRAPHIC AREA CALL are received by vessels by within a specific geographical boundary area.

1 When you receive notification of a geographical call, press any key to cancel the alert. The radio tunes to the designated channel by press ENT key or CANCEL key to normal mode with original channel. The time and the user MMSI are displayed on the screen and the call data is stored in the call log.

2 Monitor the working channel for an announcement from the calling vessel.

# 6 SETUP MENU

### 6.1 MENU FUNCTION DESCRIPTION

The radio's setup functions are accessed through the Menu mode. Menu mode selections are as follows.

| Item | Description |
|---|---|
| **BUDDY LIST** | Selects the Buddy List Entry routine to enter Names and MMSI's for frequently called DSC stations. Up to 20 names could be stored. |
| **BACKLIGHT** | Set the backlight level, total 8 level be available. |
| **CONTRAST** | Selects display contrast setting: 1-8 levels. |
| **LOCAL/DIST** | "DISTANT" allows normal receive sensitivity. "LOCAL" eliminates receiver noise, but degrades receiver sensitivity. The LOCAL icon is displayed in LCD. |
| **GPS/TIME** | Set the Position info if no GPS attached and define the display POS and Time, Time format, Offset and COG/SOG display and GPS Alert settings. |
| **RADIO SETUP** | There are 4 items that user can customize – CH Name, Ring Volume, Key Beep, INT speaker. |
| **DSC SETUP** | There are 5 functions that allow user to alter – User MMSI entry, Group MMSI entry, ATIS MMSI, ATIS ENABLE, DSC ENABLE, and POS Reply. |
| **RESET** | Recall ex-factory setting. |
| **EXIT** | |

### 6.2 SET-UP MENU NAVIGATION

To access the Menu Mode:

Press and hold ***MENU/DSC*** key, Text area displays the Set-Up Menu list.

To exit the Menu mode or sub –mode:
Press the ***16*** or ***CANCEL*** key or else select the EXIT option from the menu.
Rotate the ***CH*** knob to select the Item within the Set-Up Menu list
To confirm a selected item for adjustment, push the ***CH*** knob.
When the desired setting is done, press the ***CH*** knob to enter the setting, and move back to the Main Menu list.
Set Up operation is exited by turning the unit off. All changes are saved in EEPROM.

## 6.3 BUDDY LIST

The Buddy List can store up to 20 entries with Name and MMSI#. User can add, edit or delete the record from the list under this submenu.

### 6.3.1 ADDING AN ENTRY

1 Select Buddy List and the cursor is at <NEW> press ***CH*** knob entry page which prompt up to allow enter Name and MMSI.
2 Rotate the ***CH*** knob to select the first desired character (A-Z, 1-9, Space and Back Arrow "<") for the name. When the desired character is shown, push the ***CH*** knob to enter. Same select the next characters, The characters can be up to 12. When the last digit is entered, the activation advances to the first MMSI digit.
3 Enter the MMSI associated with that buddy name (this must be numeric) Prefix 00 will treat as Coast, Once 9 digit be entered, pops up a new page to ask for confirmation to save.
4 Press the ***CH*** knob to save the new entry, which is displayed at the top of your BUDDY LIST.
5 Press ***CANCEL*** will terminate the process without saving go back to Buddy list page.

5 When the buddy list is full. you can make a new entry and the buddy at the end of the list is automatically erased.

### 6.3.2 EDIT EXISTING ENTRY

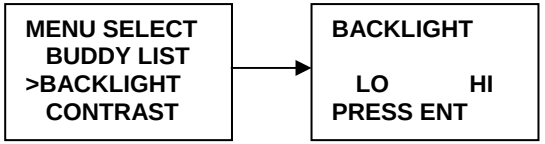
1 Pick up one from BUDDY list and edit Press ***CH*** knob one Page pops up item for you to edit or delete, Choose EDIT.
2 when you are finished editing. Press ***CH*** knob into a new page prompt in to ask for confirmation to save.
3 Press the ***CH*** knob to save the new edit. The BUDDY list is displayed again. If more changes are required repeat steps from 1 to 3 otherwise, press cancel to exit.

### 6.3.3 DELETE AN ENTRY

1 Select the one which you want to delete from the list.
2 Rotated the ***CH*** knob to select the Delete option.
3 Press and hold the ***CH*** knob to confirm the delete action.
4 The selected record will be removed and go back to BUDDY list page. You can repeat steps from 1 to 4 to delete more records, or press cancel to exit.

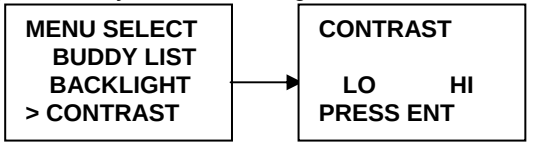
## 6.4 BACKLIGHT ADJUSTMENT

1 Select BACKLIGHT and press the ***CH*** knob. There are 8 levels control for the BACKLIGHT.
2 Rotate the ***CH*** knob to adjust the setting, Press the ***CH*** knob to permanently enter the setting and return to the MENU LIST.



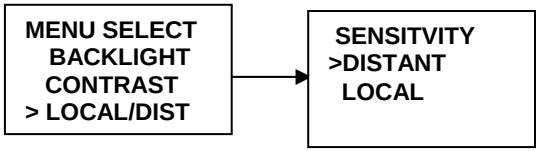

## 6.5 CONTRAST ADJUSTMENT

1 Select CONTRAST and press the ***CH*** knob. There are 8 levels control for the contrast. The higher numbers the darker LCD
2 Rotate the ***CH*** knob to adjust the setting, Press the ***CH*** knob to permanently enter the setting and return to the MENU LIST.




## 6.6 LOCAL/ DISTANT

You can set the receiver to LOCAL to eliminate noise, select the LOCAL/DST from the MENU list for local and press the ***CH*** knob. The local state is stored when screen is exited. The LOCAL icon turns ON in the LCD. Default is DISTANT



## 6.7 GPS/TIME

The radio automatically detects NMEA strings and decodes appropriate latitude/longitude position and time. If the GPS navigation receiver is not connected on or is not functional, a manual latitude/longitude position and UTC should be entered and used in the DSC distress transmitted message.

When valid Lat/Lon information is detected, the data is display on the LCD, when there is no valid position information, NO GPS INFORMATION appears.

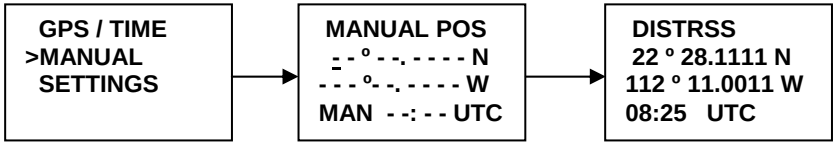
### 6.7.1 MANUAL ENTER GPS DATE

If no GPS data is available, the NO GPS INFORMATION appears, and after 2 minutes PLEASE INPUT POSITION!! is displayed with NO GPS, Alarm sounds for 10 sec or till any key is pressed.


The manual entry function is just valid if and only if no GPS connected

1 select GPS/TIME then MANUAL.
2 enter the latitude, then the longitude, then the UTC.
3 Press the ***CH*** knob, when all the information is correct.

The vessel's lat/Lot with the UTC time are shown on the screen. The manual entries are cancelled if a real GPS position is received.




### 6.7.2 SETTINGS

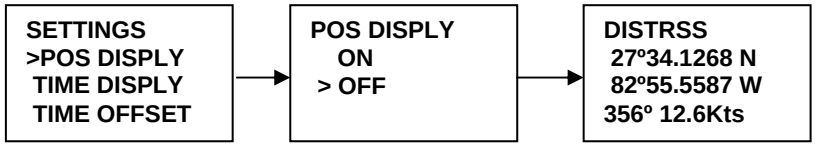
You can also set what time and position information is display on the screen

- Whether Position data is displayed
- Whether the time is displayed
- Whether a Time Zone Offset is used
- How the time data is formatted
- Whether COG/SOG data is displayed
- Whether GPS ALERT is used.

#### 6.7.2.1 POSITION DISPLAY ON/OFF

You can choose the position data displayed on the normal mode or not

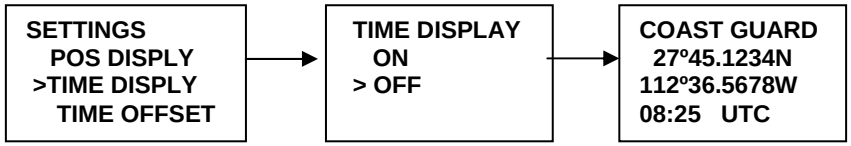
1 Select GPS/TIME then SETTINGS, then POS DISPLY
2 Select ON (on) or OFF (off) as desired, this is example, selected on and the screen shows the vessel position.




#### 6.7.2.2 TIME DISPLAY ON/OFF

You can to turn on/off the time displayed at the normal mode

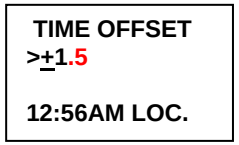
1 Select GPS/TIME then SETTINGS, then TIME DISPLY
2 Select ON (on) or OFF (off) as desired, in this example, selected on and the screen shows the vessel TIME.




#### 6.7.2.3 LOCAL TIME (TIME OFFSET)

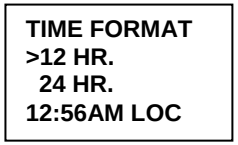
You can set the add/subtract value from UTC time to equal to local time. When offset value is added, the time will be displayed as LOC instead of UTC

First to set the offset direction + or – and then value in ½ hr. step. The updated result will be displayed immediately




#### 6.7.2.4 TIME FORMAT OPTIONS (TIME FORMAT)

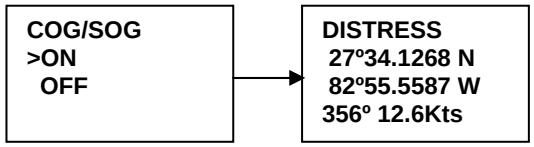
You can choose display time in 12 hr or 24 hr format.



#### 6.7.2.5 COURSE/SPEED DISPLAY OPTIONS (COG/SOG)

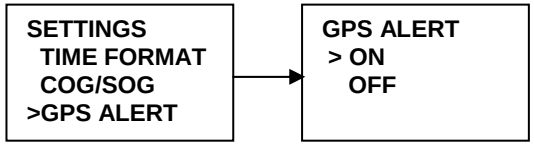
You can enable COG (Course over Ground) and SOG (Speed over Ground) displayed on normal mode.

If the TIME DISPLAY is turn ON, COG/SOG will be turned off automatically since it share the same bottom line for display.



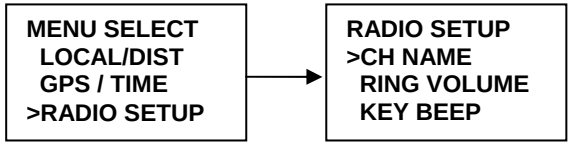

#### 6.7.2.6 GPS ALERT

You can choose NO GPS DATA alarm sound is on/off.




### 6.8 RADIO SETUP

Under Radio Setup submenu, there are 4 items that user can alter settings.



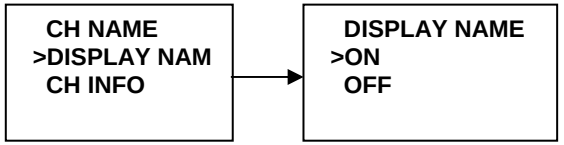

#### 6.8.1 CHANNEL NAME DISPLAY AND EDITING

To set the channel name to ON or blank on the first line. Maximum of 12 characters could be set for channel name. Channel name also allows to edit. The ways same as Buddy List edit procedures.

#### 6.8.1.1 CHANNEL NAME DISPLAY

1 Select RADIO SETUP then CH NAME, then “DISPLAY NAME”

2 Select ON (on) or OFF (off) as desired, this is example, select on and press the ***CH*** knob the screen shows the channel name.

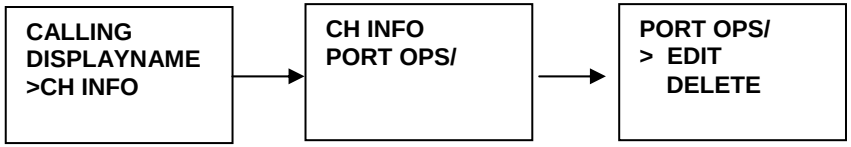



#### 6.8.1.2 CHANNEL NAME EDITING

1 Select RADIO SETUP then ***CH*** NAME, then ***CH*** INFO, Select the desired channel name by ***CH*** knob and then press the ***CH*** knob the screen shows the channel name and EDIT and DELETE.

2 Select EDIT and press the ***CH*** knob to edit the existing name tag, Input the new name over the existing name and press the ***CH*** knob to display the YES/NO conformation

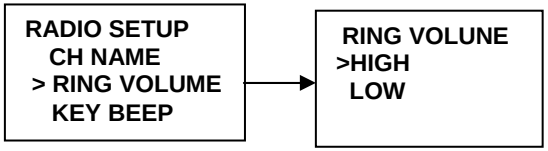
3 Press the ***CH*** knob to confirm the new channel name then press ***CANCEL*** to return to the menu.




#### 6.8.2 RING VOLUME ADJUSTMENT

1 Select the RING VOLUME by ***CH*** knob and then display the option – HIGH and LOW as ringer tone setting.

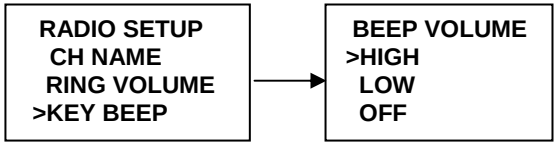
2 Press The ***CH*** knob key again to confirm the changes.




#### 6.8.3 BEEP VOLUME ADJUSTMENT

1 The key beep tone volume level. Select the **KEY BEEP** by The ***CH*** knob and then display the option – HIGH, LOW & OFF as key beep setting.

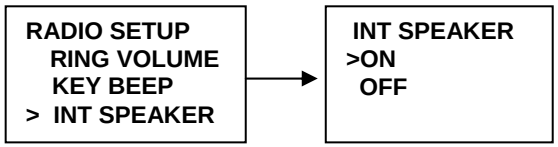
2 press The ***CH*** knob key again to confirm the changes.




#### 6.8.4 INT SPEAKER OPERATION

1 Select RADIO SETUP then INT SPEAKER.

2 Select ON (on) or OFF (off) as desired.



## 6.9 DSC SETUP

The submenu is used to set behavior of the DSC/ATIS function.
The following 6 items are available for selection.

**User MMSI**
**Group Setup**
**ATIS MMSI**
**ATIS ENABLE**
**DSC ENABLE**
**POS REPLY**

### 6.9.1 ENTER YOUR USER MMSI (USER MMIS)

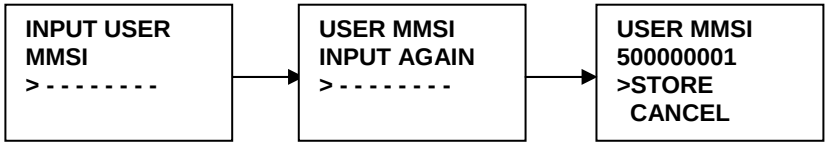
This is a once-only operation.

*You must enter your user MMSI first then you can access the DSC functions.*

1 Select DSC SETUP then USER MMSI and press the ***CH*** knob. If an existing MMSI is stored, the values appear.

2 If the MMSI is blank, a dashes line appear. Enter user MMSI along the dashed line. Press the ***CH*** knob to confirm each correct entry to move to the next digit.

If your make an error, press –until < appears, then press the ***CH*** knob to backup and correct the entry.




3 Hold the ***CH*** knob to store your user MMSI.

4 Enter your user MMSI again as a password check, hold the ***CH*** knob to permanently store the your user MMSI and return to the menu.

5 *You can view your stored user MMSI at anytime by selecting user MMSI* in the DSC SETUP menu.

6 If there is no USER MMSI stored and the radio's DSC function is Attempted, the radio says "PLEASE INPUT USER MMSI" as below.


## DSC WARNING MESSAGE

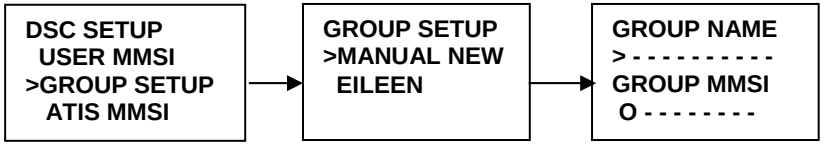
### 6.9.2 MAINTAIN GROUPS

You can program up to three group MMSI numbers and associated Group names, group MMSI numbers always begin with a zero (0). You only enter the last 8digits of the group ID number; the intial "0" is automatically entered.

#### 6.9.2.1 ENTER YOUR GROUPS

**1** Select GROUP SETUP and the cursor is at <MANUAL NEW>. If an existing names & MMSI data are stored, the values appear.
If is blank. Only MANUAL NEW appear on LCD

**2** The entry procedures are same as that of the BUDDY LIST.




#### 6.9.2.2 EDIT USER GROUPS

1 Select DSC SETUP then GROUP SETUP and press the ***CH*** knob. The existing names & MMSI data are displayed on screen. Select the Group name or, only the MMSI that you wanted

2 Press the ***CH*** knob to edit. The entry procedures are same as that of the BUDDY LIST

3 when the edition is finish press the ***CH*** knob to store the changes and return to the GROUP MMSI screen.


#### 6.9.2.3 DELETE A GROUP

1 Select GROUP SETUP and press the ***CH*** knob. The existing group names are displayed on screen

2 Select that you wanted delete and press the ***CH*** knob will display EDIT or DELETE item

3 Select DELETE and press the ***CH*** knob will display DELETE GROUP menu arrow point the YES, then press the ***CH*** knob to empty the group and return to the GROUP SETUP screen. The LCD displays the group as follow.


### 6.9.3 ENTER YOUR ATIS MMSI

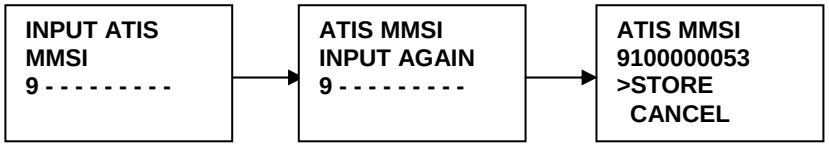
This is a once-only operation.

*You must enter your ATIS MMSI first then you can access the ATIS functions.*

1 Select DSC SETUP then ATIS MMSI and press the ***CH*** knob. If an existing MMSI is stored, the values appear.

2 If the MMSI is blank, a dashes line appear, except for the initial '9' Enter ATIS MMSI along the dashed line. Press the ***CH*** knob to confirm each correct entry to move to the next digit.

If your make an error, press –until < appears, then press the ***CH*** knob to backup and correct the entry.




3 Hold the ***CH*** knob to store your ATIS MMSI.

4 Enter your ATIS MMSI again as a password check, hold the ***CH*** knob to permanently store the your ATIS MMSI and return to the menu.

5 *You can view your stored ATIS MMSI at anytime by selecting ATIS MMSI* in the DSC SETUP menu.

### 6.9.4 ATIS ENABLE

When ATIS is enabled, the following occurs:

> DSC function are disabled.

> DUAL watch, Tri Watch and scan functions are disabled.

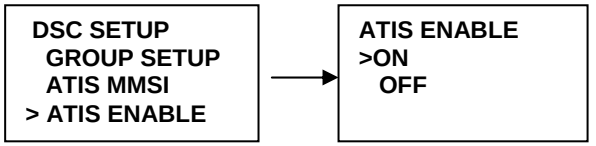
> The following international channels are limited to 1watt output power:
6,8,10,11,12,13,14,15,17,71,72,74,75,76,77(AND31, if enabled)

To enable/disable ATIS:

1 Select DSC SETUP, then ATIS ENABLE, Press the ***CH*** knob to displays ATIS ENABLE ON/OFF.

2 Select ON for turn on ATIS function.

3 press the ***CH*** knob to confirm your choice and return to the menu.



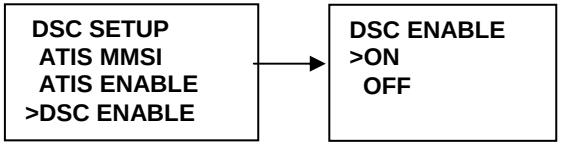

### 6.9.5 DSC ENABLE

To temporary turn off the DSC function, such as sailing to inland water or no DSC region.

1 Select DSC SETUP, then DSC ENABLE, Press the ***CH*** knob to displays DSC ENABLE ON/OFF.

2 Select OFF for turn off DSC function.

3 press the ***CH*** knob to confirm your choice and return to the menu.

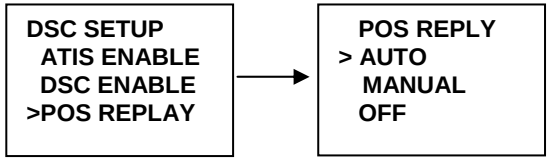



### 6.9.6 POS REPLY

You can set the radio to respond the Position Request. In one of three ways, automatic, manual, off.

1 Select DSC SETUP, then POS REPLY. Then press the ***CH*** knob, the MANUAL, AUTO, OFF appear on the screen.

2 Select your response and press the ***CH*** knob to confirm and return to the menu manual,

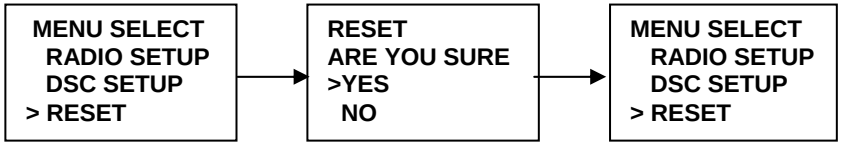



### 6.10 RESET

This feature resets every setting to the factory defaults, except USER MMSI and GROUP MMSI, ATIS MMSI.

1 Select RESET, press ***CH*** key, the radios ask for confirmation.

2 Select yes, press ***CH*** key to reset the radio and return to the menu.



## 7 MAINTENANCE

Your VHF Marine Radio RT-2900 is a marine radio of water proof who can meet the requirement of JIS level 7, gives you a good reliability when using in marine circumstance.

The equipment is designed to be maintenance free. To keep your radio in good working condition:

- Never unscrew the equipment, either the base station or handset. For in such case, the waterproof performance will be greatly damaged.
- If the radio becomes dirty and dusty, wipe it clean with a moisture cloth, but pay attention to never using such solvents as benzene or alcohol, for they may damage the radio surfaces.
- Once your equipment does not work properly, never allow an unqualified person to tamper with internal adjustments. Please contact the local dealer for help.

**TROUBLE SHOOTING**

| Item | Symptom | Cause/Remedy |
|---|---|---|
| 1 | Unit cannot be powered on. | ● Check the connection to the base station.<br>● Check the volume control. |
| 2 | No sound comes from the speaker | ● Set [VOL] to a suitable level.<br>● Set squelch to the threshold point. |
| 3 | Transmitting is impossible, or high power can not be selected. | ● Check to see if the ***PTT*** switch is defective.<br>● Check to see if the microphone or MIC jack is defective.<br>● Some channels are for low power or receive only, change to another channel.<br>● Push ***H/L*** to select high power. |
| 4 | Low receiver sensitivity. | ● Check to see if the antenna being bad connected.<br>● Check the connection between coaxial cable and base station. |

## 8 SPECIFICATION

TX Frequency……**156.025 ~ 157.425 MHz**
RX Frequency……**156.050 ~162.025 MHz**
Channels……**57 USA Channels**
**57 INT Channels**
Modulation type……**FM**
Antenna impedance……**50 Ohm**
Microphone……**condenser type**
Power supply……**13.8V DC**
Sensitivity at 12dB Sinad……**0.5μV**
Adjacent Channel Rejection……**70dB**
Audio output power……**2W @ 8 Ohm**
Audio Distortion ……**10%**
RF Output Power……**High: 25W/Low: 1W**
Harmonic Emissions……**High: 80dB/Low: 60dB**
Dimensions (HWT)……**71×161×147mm**
Weight ……**1290g**

| INT | | | | | USA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CH | Frequency (MHZ) | | | | CH | Frequency (MHZ) | | | |
| | TX | RX | Mode | Remark | | TX | RX | Mode | Remark |
| 1 | 156.050 | 160.650 | D | | 01A | 156.050 | 156.050 | S | |
| 2 | 156.100 | 160.700 | D | | 03A | 156.150 | 156.150 | S | |
| 3 | 156.150 | 160.750 | D | | 05A | 156.250 | 156.250 | S | |
| 4 | 156.200 | 160.800 | D | | 6 | 156.300 | 156.300 | S | |
| 5 | 156.250 | 160.850 | D | | 07A | 156.350 | 156.350 | S | |
| 6 | 156.300 | 156.300 | S | 1W ATIS | 8 | 156.400 | 156.400 | S | |
| 7 | 156.350 | 160.950 | D | | 9 | 156.450 | 156.450 | S | |
| 8 | 156.400 | 156.400 | S | 1W ATIS | 10 | 156.500 | 156.500 | S | |
| 9 | 156.450 | 156.450 | S | | 11 | 156.550 | 156.550 | S | |
| 10 | 156.500 | 156.500 | S | 1W ATIS | 12 | 156.600 | 156.600 | S | |
| 11 | 156.550 | 156.550 | S | 1W ATIS | 13 | 156.650 | 156.650 | S | 1W PTT HI |
| 12 | 156.600 | 156.600 | S | 1W ATIS | 14 | 156.700 | 156.700 | S | |
| 13 | 156.650 | 156.650 | S | 1W ATIS | 15 | ---- | 156.750 | D | Rx Only |
| 14 | 156.700 | 156.700 | S | 1W ATIS | 16 | 156.800 | 156.800 | S | |
| 15 | 156.750 | 156.750 | S | 1W | 17 | 156.850 | 156.850 | S | 1W |
| 16 | 156.800 | 156.800 | S | | 18A | 156.900 | 156.900 | S | |
| 17 | 156.850 | 156.850 | S | 1W | 19A | 156.950 | 156.950 | S | |
| 18 | 156.900 | 161.500 | **D** | | 20 | 157.000 | 161.600 | | |
| 19 | 156.950 | 161.550 | **D** | | 20A | 157.000 | 157.000 | S | |
| 20 | 157.000 | 161.600 | **D** | | 21A | 157.050 | 157.050 | S | |
| 21 | 157.050 | 161.650 | **D** | | 22A | 157.100 | 157.100 | S | |
| 22 | 157.100 | 161.700 | **D** | | 23A | 157.150 | 157.150 | S | |
| 23 | 157.150 | 161.750 | **D** | | 24 | 157.200 | 161.800 | **D** | |
| 24 | 157.200 | 161.800 | **D** | | 25 | 157.250 | 161.850 | **D** | |
| 25 | 157.250 | 161.850 | **D** | | 26 | 157.300 | 161.900 | **D** | |
| 26 | 157.300 | 161.900 | **D** | | 27 | 157.350 | 161.950 | **D** | |
| 27 | 157.350 | 161.950 | **D** | | 28 | 157.400 | 162.000 | **D** | |
| 28 | 157.400 | 162.000 | **D** | | 61A | 156.075 | 156.075 | S | |
| 60 | 156.025 | 160.625 | **D** | | 63A | 156.175 | 156.175 | S | |
| 61 | 156.075 | 160.675 | **D** | | 64A | 156.225 | 156.225 | S | |
| 62 | 156.125 | 160.725 | **D** | | 65A | 156.275 | 156.275 | S | |
| 63 | 156.175 | 160.775 | **D** | | 66A | 156.325 | 156.325 | S | |
| 64 | 156.225 | 160.825 | **D** | | 67 | 156.375 | 156.375 | S | 1W PTT HI |
| 65 | 156.275 | 160.875 | **D** | | 68 | 156.425 | 156.425 | S | |
| 66 | 156.325 | 160.925 | **D** | | 69 | 156.475 | 156.475 | S | |
| 67 | 156.375 | 156.375 | S | | 70 | 156.525 | 156.525 | S | Rx Only |
| 68 | 156.425 | 156.425 | S | | 71 | 156.575 | 156.575 | S | |
| 69 | 156.475 | 156.475 | S | | 72 | 156.625 | 156.625 | S | |
| 70 | 156.525 | 156.525 | S | Rx Only | 73 | 156.675 | 156.675 | S | |
| 71 | 156.575 | 156.575 | S | 1W ATIS | 74 | 156.725 | 156.725 | S | |
| 72 | 156.625 | 156.625 | S | 1W ATIS | 77 | 156.875 | 156.875 | S | 1W |
| 73 | 156.675 | 156.675 | S | | 78A | 156.925 | 156.925 | S | |
| 74 | 156.725 | 156.725 | S | 1W ATIS | 79A | 156.975 | 156.975 | S | |
| 75 | 156.775 | 156.775 | S | 1W | 80A | 157.025 | 157.025 | S | |
| 76 | 156.825 | 156.825 | S | 1W | 81A | 157.075 | 157.075 | S | |
| 77 | 156.875 | 156.875 | S | 1W ATIS | 82A | 157.125 | 157.125 | S | |
| 78 | 156.925 | 161.525 | **D** | | 83A | 157.175 | 157.175 | S | |
| 79 | 156.975 | 161.575 | **D** | | 84 | 157.225 | 161.825 | **D** | |
| 80 | 157.025 | 161.625 | **D** | | 84A | 157.225 | 157.225 | S | |
| 81 | 157.075 | 161.675 | **D** | | 85 | 157.275 | 161.875 | **D** | |
| 82 | 157.125 | 161.725 | **D** | | 85A | 157.275 | 157.275 | S | |
| 83 | 157.175 | 161.775 | **D** | | 86 | 157.325 | 161.925 | **D** | |
| 84 | 157.225 | 161.825 | **D** | | 86A | 157.325 | 157.325 | S | |
| 85 | 157.275 | 161.875 | **D** | | 87 | 157.375 | 161.975 | **D** | |
| 86 | 157.325 | 161.925 | **D** | | 87A | 157.375 | 157.375 | S | |
| 87 | 157.375 | 157.375 | S | | 88 | 157.425 | 162.025 | D | |
| 88 | 157.425 | 157.425 | S | | 88A | 157.425 | 157.425 | S | |

Notes:

KEY: S=Simplex operating channel; D=Duplex operating channel.

1. Low Power (1W) only.
2. 1W PTT HI: override to HIGH POWER by holding down H/L key before transmitting. Used normally in bridge-to-bridge communications.
3. The text “A” illuminated by the channel number indicates the USA channel is simplex. This same channel is always duplex when selecting international. This is no “A” reference for international channels.