

**LOWRANCE**

# Link-8 VHF

## User Guide

ENGLISH



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| <b>Important safety information</b><br>Please read carefully before installation and use. |                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death. |
|         | WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury                                                                 |
|         | CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.                                                               |
|         | CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.                                     |

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# Section 1 - General Information

## 1-1 Features

Congratulations on your purchase of this Lowrance Link-8 marine band VHF radio. Your Link-8 provides you with the following useful features:

- Access to all currently available Marine VHF Channel Banks (USA, Canada, International) including weather channels where available (model dependant)
- DSC (Digital Select Calling) capability that meets Class D standards
- Separate CH70 DSC receiver built in
- ATIS facility for inland waterways (EU models)
- 10 weather channels (where available)
- NOAA and SAME weather alert capability (US models)
- Dual channel AIS receiver built in - receive AIS transmissions (receive only)
- Choice of High or Low (25 W or 1 W) transmission power
- Special CH16 or CH16/9 key for quick access to the priority (International Distress) channel
- DISTRESS call button to automatically transmit the MMSI and position until an acknowledgement is received
- Special 3CH key for quick selection of your three favorite channels
- Memory channel scan and All channel priority scan
- Dual/Tri Watch capability
- Call log for the 20 most recent incoming DSC calls
- Distress call log for the 20 most recent distress calls
- Easy access to a buddy list of up to 20 favorite people
- MMSI storage for 20 favorite groups
- GROUP CALL and ALL SHIPS CALL facility
- LL position polling and Track Your Buddy feature
- Automatic position and time update when connected to a GPS receiver
- Adjustable keypad backlighting for easy night-time use
- Adjustable contrast settings for the LCD
- Waterproof and submersible to comply with JIS-7
- Rotary channel selector knob with Push To Select function
- Speaker microphone with large PTT key and 6 keys for easy channel and mode selection
- 30 W Hailer with listen back capability
- Foghorn (manual and automatic)
- Great Circle GPS navigation calculations to a waypoint (stores up to 200 waypoints)
- NMEA 2000 & NMEA 0183 connectivity
- Local/Distance sensitivity to eliminate noise in high traffic urban areas

## 1-2 Customizing your Lowrance VHF Radio

---

You can customize the radio to suit your individual preferences. Some preferences can be set directly through the keys as explained in this section.

Other preferences are set up through the built-in menus and these are explained in the other sections.

## 1-3 How to Display and Navigate Menus

---

1. Press MENU (or CALL) key.
2. Some line items may show an ▲ or ▼ indicator. This means there is more information available to show. Scroll (rotate the Rotary knob, or use + / - keys on the handset mic) to scroll up and down the menu until the cursor is positioned at the desired option. Press ENT (press the Push To Select) to display that option.
3. Make any entries or changes as explained in the following section.
4. Press ENT to confirm changes. Otherwise, press EXIT to keep the original entry.
5. Press EXIT to backup one screen (this key is equivalent to an ESC function on a PC)

## 1-4 How to Enter Alphanumeric Data

---

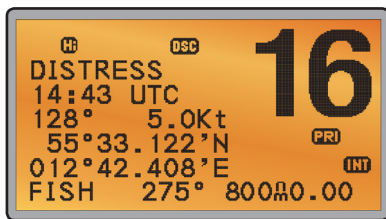
If your radio does not have the optional alphanumeric microphone, you can rotate the rotary knob, or use +/- keys on the handset mic to enter alphanumeric data.

- Press - to count through numbers, or hold down to scroll rapidly to the desired number.
- Press + to step through the alphabet, or hold down to scroll rapidly to the desired character.
- If you make an error, press - until < is displayed, then press ENT to backup and correct the entry.

## 1-5 LCD Symbols and Meanings

---

A typical operational display is shown here:





















The bottom line is blank when a waypoint is not selected. This operational display shows:





- the channel that you are receiving (**16**) and Tx power is set to high (**Hi**)
- the International channel bank selected (**INT**) and DSC is enabled (**DSC**)
- the channel name tag (**DISTRESS**)



- your current course (**128°**) and speed (**5.0kt**)
- your latitude (**55°33.122N**) and longitude (**012°42.408E**) and UTC time displayed in 24 hour format (**14:43** - 2:43pm).
- the name of the destination waypoint (**FISH**), its bearing (**275°**), your distance in nautical miles, mile, or kilometres (depending on your choice of units) - in this case, **800nm**, and the cross track error (XTE - **0.00**) are shown.

All the symbols that may appear on the LCD are explained here:

| Symbol                                                                             | Meaning                                                                                                                                    |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|    | Transmitting.                                                                                                                              |
|    | Receiver busy with an incoming signal.                                                                                                     |
|    | Scanning for the broadcasting channel. Press PTT to stop scanning. When the broadcasting channel is found, scanning stops at that channel. |
|    | Dual watch mode.                                                                                                                           |
|    | Tri watch mode.                                                                                                                            |
|    | DSC function is enabled.                                                                                                                   |
|    | ATIS is enabled for use in European inland waterways. Otherwise, blank.                                                                    |
|    | AIS function is enabled.                                                                                                                   |
|    | Incoming DSC call, or blinks to notify you of any unread call log messages.                                                                |
| DISTRESS                                                                           | Channel name tag.                                                                                                                          |
| 55°33.122N                                                                         | Your latitude.                                                                                                                             |
| 012°42.408E                                                                        | Your longitude.                                                                                                                            |
| 14:43 UTC                                                                          | Time (UTC). Local time has suffix LOC (for example; 12:30pm LOC)                                                                           |
| 16                                                                                 | Channel selected.                                                                                                                          |
|    | Local calling is selected. Otherwise, blank for distance calling.                                                                          |
|  | Channel is temporarily deleted 'skipped' from the SCAN operation.                                                                          |
|  | Channel suffix, if applicable - <b>A</b> or <b>B</b> - otherwise blank.                                                                    |
|  | Shows which of the 3 favorite channels, if any, are selected. <b>CH1, CH2, CH3</b> - otherwise blank.                                      |
|  | Transmission power. High ( <b>Hi</b> ) 25 W or Low ( <b>Lo</b> ) 1 W.                                                                      |
|  | Selected channel bank for VHF radio operations and regulations. <b>INT</b> =International; <b>USA</b> =USA; <b>CAN</b> =CANADA             |
|  | Weather channel.                                                                                                                           |
|  | Weather alert. <i>US only</i> .                                                                                                            |
|  | Specific Area Message Encoding. <i>US only</i> .                                                                                           |

|                                                                                  |                                                           |
|----------------------------------------------------------------------------------|-----------------------------------------------------------|
|     | Duplex operation. Otherwise, blank for Simplex operation. |
|   | Priority channel is selected.                             |
| <b>ACK</b>                                                                       | Your DSC call has been received.                          |
|  | Low Battery warning (activates at 10.5 V).                |
| FISH 275°                                                                        | Waypoint name and bearing.                                |
| 800nm                                                                            | Distance to waypoint.                                     |
| 0.00                                                                             | XTE (Cross track error).                                  |
| <b>NO GPS</b>                                                                    | GPS data is not available.                                |
|   | AUTO SWITCH is disabled.                                  |

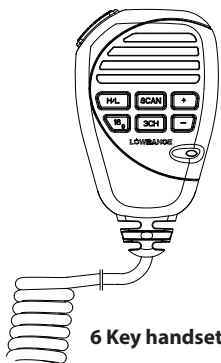
### **1-3 Beep tones & call alerts**

---

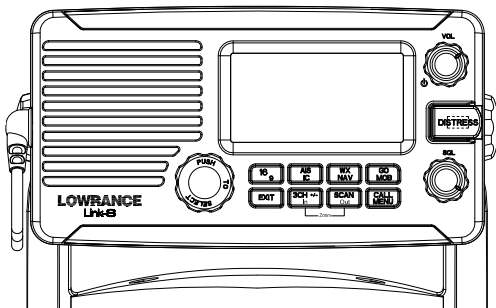
- Error 2 short beeps
- Acknowledge 1 long beep
- Alarm Two-tone ring (repeated for 2 minutes or until any key is pressed)
- LL position call alert Friendly 5-tone ring sequence (press any key to cancel)
- WX alert/SAME alert Ear-catching multi-tone sequence
- ROUTINE call alert Friendly 5-tone ring sequence (press any key to cancel)
- URGENCY call alert Two-tone ring (repeated for 2 minutes or until any key is pressed)
- SAFETY call alert Two-tone ring (repeated for 2 minutes or until any key is pressed)
- DISTRESS call alert Two-tone ring (repeated for 2 minutes or until any key is pressed)

## Section 2 - Basic Operation and Key Functions

All possible keys and their functions are listed here. Note that some of the keys may not be available, depending on your Lowrance VHF radio model.



6 Key handset mic



Link-8 base station radio

### Key:

### Function:

**VOL /**

### Volume and Power.

Turn clockwise to power on. Continue to turn until a comfortable volume is reached. VOL / will also adjust the settings of an external speaker, if connected.

**SQL**

### Squelch or Threshold Level.

Sets the threshold level for the minimum receiver signal. Turn fully counterclockwise until random noise is heard, then turn slowly clockwise until the random noise disappears. Make another 1/4 turn clockwise for best reception in open sea conditions. In areas of high noise (eg. close to large cities) reception may improve if sensitivity is reduced. Either turn SQL slowly clockwise or use the LOCAL setting. See section 3-4.

**16 / 9**

### Priority Channel.

Also on the handset mic. Press to cancel all other modes and to tune into the priority channel. Press again to return to your original channel. The default Priority Channel is CH16.

**For US models:** To make Channel 09 the priority channel, hold down 16/9 until a beep sounds and 09 is displayed.

**DISTRESS**

### Send a DSC Distress Call.

DSC must be active and an MMSI must be programmed. See Section 7. Lift the red cover door then press and release DISTRESS to show the DISTRESS menu. Select the category you want to transmit. Hold down DISTRESS for about 3 seconds to transmit.

The DISTRESS key can also be held down continuously to transmit an "undefined" category Distress call.

See Section 8 for more information about distress calls.

## PTT

### Press To Talk.

(Located on the handset mic). Press PTT to transmit at any time on an allowable channel. This automatically exits you from menu mode and stops scanning. You must release PTT to receive a signal.

If PTT sticks, a built-in timer will automatically shut down a transmission after five minutes and sound a short error beep.

## PUSH TO SELECT **Enter (ENT).**

When you are in MENU mode, push the center of the Channel Select knob to enter your choice or setting. This is referred to throughout the manual as "press ENT".

## Rotary knob

### Channel Select.

Turn to select a channel. The current channel is shown on the LCD in BIG digits and an A or B designator suffix (if applicable) in small letters below the channel number. See Appendix C for a complete listing of channel charts.

Push to activate the **ENT** function.

### Alphanumeric Entry.

You can also use the rotary knob for alphanumeric entry. Turn to step through alphanumeric characters one at a time, then push to confirm each selection. If you make an error, select the < character then push to backup.

## + / -

### Channel Select.

(Located on the handset mic). The current channel is shown on the screen in BIG digits with an appropriate designator suffix A or B in small letters below the channel number.

Press + or - to step through the available channels one at a time, or hold down to scroll rapidly through all the available channels.

See Appendix C for a complete listing of channel charts.

### Alphanumeric Entry.

This key can be used for both menu selection and for alphanumeric entry. Press + or - to scroll the cursor up or down to menu options when navigating menus.

When editing an item containing only numbers, press - to count through the numbers or hold down to scroll rapidly.

To enter a character, press + to step through the alphabet or hold down to scroll rapidly.

## EXIT

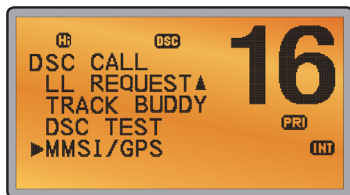
### Escape (ESC).

Use EXIT when navigating menus, to clear incorrect entries, to exit from a menu without saving changes, and to back up to the previous screen.

## CALL/MENU

### DSC CALL menu.

Quick press to enter the DSC CALL menu and make DSC calls. See Section 5.




## Radio and DSC Setup MENU mode.

Hold down for about 1 second to show the radio MENU so that you can customize your radio. See section 4

## WX/NAV

### Weather Channel.

**For US models:** In USA and Canadian waters, press to hear the most recently selected weather station. The WX symbol  is displayed on the LCD. Rotate the dial or + / - on the handset mic to change to a different weather channel. Press WX again to return to the most recent channel. If the weather alert mode (ALT) is ON and an alert tone of 1050 Hz is broadcast from the weather station, it is picked up automatically and the alarm sounds. Press any key to hear the weather alert voice message.

**Note:** If SAME is activated and the 6 digit County IDs you want to monitor are entered, the radio will sound the weather alarm when it detects a weather alert or weather hazard alert on the selected weather channel.

**For all other models:** The Wx key can be programmed to a weather channel of your choice. See section 4-11 to program your favourite channel.

### NAV (Show Waypoint).

Hold down for about 1 second to enter the Navigation mode.

If a waypoint is already selected, the bearing and distance to the waypoint and the cross track error are shown on the bottom line of the LCD.



If you are in Navigation mode and want to scan all the VHF channels while staying in Navigation mode, just hold down SCAN.

Press SCAN to quit scanning.

## 3CH

### Three Favourite Channels.

Also on the handset mic. Press to toggle between your favourite channels. The CH1, CH2, or CH3 symbol appears on the LCD to show which favourite channel is selected.

To scan only one of your favourite channels, press 3CH then immediately press and release SCAN. If you want to scan all three favourite channels, press 3CH then immediately press and hold SCAN.

To add a favourite channel for the first time, select that channel then hold 3CH to store it in the CH1 location. Repeat the procedure to store two more favourite channels in the CH2 and CH3 locations respectively.

If you try and add another favourite channel it will overwrite the existing CH3. CH1 and CH2 remain unless you delete them.

To delete a favourite channel, select that channel then hold down 3CH until the CH1, CH2 or CH3 symbol disappears off the LCD.

## SCAN

### Scan (ALL SCAN & 3CH SCAN).

There are two SCAN modes you can use to find the broadcast channel:

- ALL SCAN mode scans ALL channels in sequence, and checks the priority channel every 2 seconds.
- 3CH SCAN mode scans the favorite channels and CH16.

When a signal is received, scanning stops at that channel and **BUSY** appears on the LCD. If the signal ceases for more than 5 seconds, the scan restarts.

Press SCAN or PTT to stop at the current channel.

If you are in NAVIGATION mode and want to scan the DSC channels while staying in that mode, just hold down SCAN.

**Note:** SCAN functionality is limited in some European countries and, if ATIS mode is enabled, the 3CH SCAN mode will be disabled and an error beep will sound.

**Note:** The weather channel is also scanned if TONE ALERT or SAME is ON (US only).

#### ALL SCAN mode:

Hold down SCAN for about 3 seconds to start an ALL SCAN. ALL SCAN appears on the LCD.

Press ENT to temporarily skip over (lock out) an "always busy" channel when in ALL SCAN mode. **SKIP** is shown on the top line of the LCD to designate a skipped channel. SKIP will disappear when the radio is powered OFF/ON. With scanning OFF and the SKIP channel selected, press ENT to cancel the skipped channel.

**Note:** It is not possible to skip over the priority channel.

Press SCAN to stop at the current channel.

Press EXIT to cancel scan mode and return to normal operation.

#### 3CH SCAN mode:

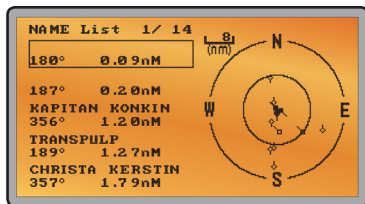
With any of your three favorite channels selected (by pressing the 3CH key) hold down SCAN to start all 3CH scanning. Press SCAN again to stop at the broadcast channel, or press EXIT to quit 3CH SCAN and return automatically to the previous broadcast channel.

## AIS / IC

### AIS (Automatic Identification System)

Quick press to enter the AIS menu.

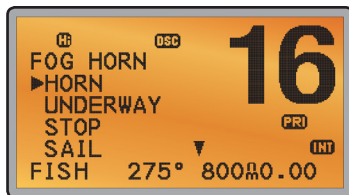
See section 6 for AIS setup or Section 9 for AIS functionality.



### IC (FOG HORN mode)

Hold down for about 1 second to enter HAILER mode. Select FOG HORN. The FOG HORN will sound certain international standard fog horn tones through the hailer speaker depending on the mode selected.

See section 10 for HAILER functionality.



### IC (PA HAILER mode)

Hold down for about 1 second to enter HAILER mode. Select PA (Public Address). The PA allows you to make an announcement at high volume to people or vessels using the Link-8 hand mic.

See section 10 for HAILER functionality.

## GO / MOB

### GO (Reset the Cross Track Error)

**Note:** A valid GPS signal must be received to see this selection.

Press GO if you are navigating to a waypoint and want to reset the cross track error.

This is a **very** useful single keystroke feature to use if you wander a little off-course but want to continue to your active waypoint.

The bearing and distance to the waypoint and any cross track error are shown on the bottom line of the LCD.

### MOB (Man Over Board)

Hold down MOB until the radio automatically enters Navigation mode, saves your current latitude and longitude as the MOB waypoint and immediately sets this position as the destination waypoint.

You will see the following sequence of LCDs:

```
HOLD 3 SEC  
FOR MOB  
RELEASE TO  
SAVE
```

```
HOLD 2 SEC  
FOR MOB  
RELEASE TO  
SAVE
```

```
HOLD 1 SEC  
FOR MOB  
RELEASE TO  
SAVE
```

```
MOB  
B:010°  
D:0.01  
X:0.00
```

The bearing and distance to the Man Overboard position, and any cross track error (XTE), are shown on the bottom line of the LCD.

To cancel MOB, select another waypoint.

## MOB (Temporary Waypoint)

To mark your current position as a temporary waypoint, hold down MOB and release the key before the 3 second countdown ends.

You will see the following sequence of LCDs:

HOLD 3 SEC  
FOR MOB  
RELEASE TO  
SAVE

HOLD 2 SEC  
FOR MOB  
RELEASE TO  
SAVE

HOLD 1 SEC  
FOR MOB  
RELEASE TO  
SAVE

The new temporary waypoint is shown in your waypoints list. Hold down MENU, press ENT, then press ENT again to display the waypoints list (TEMP1, WP001, WP002).

You cannot store more than three temporary waypoints. If you store another temporary waypoint, TEMP1 is overwritten with the new information.

## H/L

### Transmission Power.

(Located on the handset mic). High (HI) 25 W or Low (LO) 1 W. Press to toggle between high or low transmission power for the entire channel bank. The HI or LO selection is shown on the LCD.

Some channels allow only low power transmissions. Error beeps will sound if the power transmission setting is incorrect.

Some channels allow only low power transmissions initially, but can be changed to high power by holding down H/L and PTT at the same time.

See Appendix C for a complete listing of channel charts.

## Soft Keys:

This radio uses virtual soft keys during certain functions. A soft key is defined by a name that appears at the bottom of the LCD that positioned immediately above an actual key on the radio. A soft key provides you with the additional function or choice when the soft key appears during certain functions:

## ACK

### Able key (WX/NAV key).

Press to ACK (acknowledge) a DSC call

## ACCEPT

### Accept key (AIS/IC key).

Press to ACCEPT a channel request. The radio will immediately change to the requested channel

## NEW-CH

### New channel request key (AIS/IC key).

Press to request a new channel

## PAUSE

### PAUSE key (WX/NAV key).

Press to pause a call when in repeat mode

## RESEND

### Resend key (AIS/IC key).

Press to resend the DSC call

## SILENC

### Silence key (AIS/IC key).

Provided as an option to silence an audible alarm



## Section 3 - Radio MENU SELECT Options

Hold down CALL MENU for about 1 second to access any of the following radio MENU SELECT options.

Menu options shown inside the gray boxes are explained in this section.

|                    |                               |                    |                      |
|--------------------|-------------------------------|--------------------|----------------------|
| <b>WAYPOINT</b>    |                               |                    | <b>Section 3-1</b>   |
| <b>BACKLIGHT</b>   |                               |                    | <b>Section 3-2</b>   |
| <b>BUDDY LIST</b>  |                               |                    | <b>Section 3-3</b>   |
| <b>LOCAL/DIST</b>  |                               |                    | <b>Section 3-4</b>   |
| <b>CONTRAST</b>    |                               |                    | <b>Section 3-6</b>   |
| <b>GPS/DATA</b>    | <b>MANUAL</b>                 |                    | <b>Section 3-6-1</b> |
|                    | <b>SETTING</b>                | <b>TIME OFFSET</b> | <b>Section 3-6-2</b> |
|                    |                               | <b>TIME FORMAT</b> | <b>Section 3-6-3</b> |
|                    |                               | <b>TIME DISPLY</b> | <b>Section 3-6-4</b> |
|                    |                               | <b>LL DISPLY</b>   | <b>Section 3-6-5</b> |
|                    |                               | <b>COG/SOG</b>     | <b>Section 3-6-6</b> |
|                    |                               | <b>GPS ALERT</b>   | <b>Section 3-6-6</b> |
| <b>RADIO SETUP</b> | UIC (US and AUS only)         |                    | Section 4-1          |
|                    | CH NAME                       |                    | Section 4-2          |
|                    | RING VOLUME                   |                    | Section 4-3          |
|                    | KEY BEEP                      |                    | Section 4-4          |
|                    | UNITS                         |                    | Section 4-5          |
|                    | INT SPEAKER                   |                    | Section 4-6          |
|                    | WATCH MODE (US only)          |                    | Section 4-7          |
|                    | WX ALERT (US only)            | TONE ALERT         | Section 4-8-1        |
|                    |                               | SAME ALERT         | Section 4-8-2        |
|                    |                               | SAME CODE          | Section 4-8-3        |
|                    | COM PORT                      |                    | Section 4-9          |
|                    | GPS SOURCE                    |                    | Section 4-10         |
|                    | FAV CH SETU (EU and AUS only) |                    | Section 4-11         |
| <b>DSC SETUP</b>   | USER MMSI                     |                    | Section 5-1          |
|                    | GROUP SETUP                   |                    | Section 5-2          |
|                    | ATIS MMSI (EU only)           |                    | Section 5-3          |
|                    | ATIS SELECT (EU only)         |                    | Section 5-4          |
|                    | INDIV REPLY                   |                    | Section 5-5          |
|                    | DSC FUNC                      |                    | Section 5-6          |
|                    | LL REPLY                      |                    | Section 5-7          |
|                    | AUTO SWITC                    |                    | Section 5-8          |
|                    | TEST REPLY                    |                    | Section 5-9          |
|                    | TIMEOUT                       |                    | Section 5-10         |
| <b>AIS SETUP</b>   | AIS FUNC                      |                    | Section 6-1          |
|                    | AIS DISPLAY                   |                    | Section 6-2          |
|                    | BAUD RATE                     |                    | Section 6-3          |
|                    | GPS REDIR                     |                    | Section 6-4          |
|                    | CPA ALARM                     |                    | Section 6-5          |
|                    | CPA                           |                    | Section 6-6          |
|                    | TCPA                          |                    | Section 6-7          |
| <b>GPS SIM</b>     |                               |                    | <b>Section 3-7</b>   |
| <b>RESET</b>       |                               |                    | <b>Section 3-8</b>   |

### 3-1 Manage your Waypoints List (WAYPOINT)

- You can store a maximum of 200 waypoints with their LL positions. When your waypoint list is full, you cannot make a new entry until you have deleted an existing entry.
- Each waypoint name can have a maximum of 6 alphanumeric characters.
- Waypoints are stored in order of entry, with the most recent entry shown first.
- The waypoints are displayed in columns of 6 with a box. Rotate the Channel Select knob to scroll through the columns to easily locate your desired waypoint. Then press ENT and use the Channel Select knob to select a waypoint within the column.

#### 3-1-1 Add a new waypoint

```
MENU SELECT
▶WAYPOINT
BACKLIGHT
BUDDY LIST
LOCAL/DIST▼
```

```
WAYPOINT
▶WP LIST
NEAREST WP
TEMP
```

```
WP LIST
NEW WP R14W05
R01W02 R14W04
R01W01 R14W03
```

```
ENTER WP
-----
°-----°N
°-----°W
```

```
ENTER WP
R01W03
17°32.233°N
160°45.651°E
```

```
SAVE
▶YES
NO
```

```
WP LIST
NEW WP R01W01
R01W03 R14W05
R01W02 R14W04
```

1. Select WAYPOINT then WP LIST.
2. Your waypoint list is displayed. Press ENT.
3. NEW WP starts to flash. Press ENT to add a new waypoint.
4. Enter a waypoint name (maximum 6 characters), then the latitude, then the longitude.
5. Press ENT when all the information is correct then select YES.

The new waypoint is saved and your waypoint list is displayed again.

#### 3-1-2 Edit or Delete a Waypoint

```
MENU SELECT
▶WAYPOINT
BACKLIGHT
BUDDY LIST
LOCAL/DIST▼
```

```
WAYPOINT
▶WP LIST
NEAREST WP
TEMP
```

```
WP LIST
NEW WP R14W05
R01W02 R14W04
R01W01 R14W03
```

```
R14W05
▶WP EDIT
DELETE
GO
TX WPT DATA
```

```
WP EDIT
R14END
17°32.233°N
160°45.651°E
```

```
SAVE
R14END
▶YES
NO
```

```
WP LIST
NEW WP R01W01
R01W03 R14END
R01W02 R14W04
```

1. Select WAYPOINT then WP LIST.

**Note:** A valid GPS signal must be received to see parts of this selection.

- Your waypoint list is displayed. Press ENT.
- NEW WP starts to flash. Scroll down to the incorrect entry. The selected waypoint flashes. Press ENT again.
- To delete the waypoint, select DELETE then YES. The waypoint is deleted immediately and the waypoint list is refreshed and displayed again.
- To edit the waypoint, select WP EDIT. The cursor is at the first character of the name. Edit the waypoint name **or** to edit only the latitude or longitude, press ENT repeatedly until the cursor moves to the required line.
- When you are finished, press ENT (repeatedly if necessary) until an updated page appears.
- Press ENT to store the changes. The waypoint list is displayed again. If more changes are required, repeat steps 2 through 6. Otherwise, press EXIT to cancel any edits.

### 3-1-3 Go to a New Waypoint

```
MENU SELECT
▶WAYPOINT
BACKLIGHT
BUDDY LIST
LOCAL/DIST▼
```

```
WAYPOINT
▶WP LIST
NEAREST WP
TEMP
```

```
WP LIST
NEW WP R14W05
R01W02 R14W04
R01W01 R14W03
```

```
R01W01
WP EDIT
DELETE
▶GO
TX WPT DATA
```

- Select WAYPOINT then WP LIST.
- Your waypoint list is displayed. Press ENT.
- NEW WP starts to flash. Scroll down to the waypoint you want to go to. The selected waypoint flashes. Press ENT again.
- Select GO.
- Select Yes. The waypoint is set immediately as the destination waypoint.

**Tip:** If you are in the NAV big number screen, just turn the Channel Select knob to immediately access the Waypoint List. Select the new waypoint and press ENT.

### 3-1-4 Go to Nearest Waypoint (NEAREST WP)

**Note:** A valid GPS signal must be received to see this selection.

```
MENU SELECT
▶WAYPOINT
BACKLIGHT
BUDDY LIST
LOCAL/DIST▼
```

```
WAYPOINT
▶WP LIST
NEAREST WP
TEMP
```

```
NEAREST WP
▶R01W04 001°
90m
R01W01 003°
136m
```

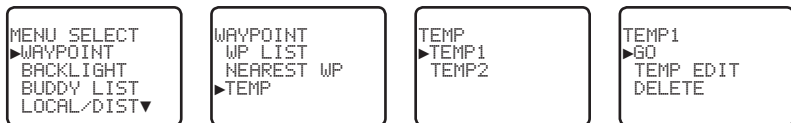
- Select WAYPOINT then NEAREST WP.
- Press ENT to display the nearest waypoint with distance and bearing from your current position.

Other waypoints are listed in increasing distance from your current position.

- Press ENT to set the nearest waypoint as the active waypoint OR move the cursor to another waypoint and then press ENT.

The chosen waypoint is shown on the bottom line of the LCD.

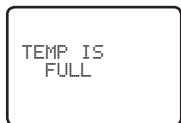
### 3-1-5 Go to Temporary Waypoint



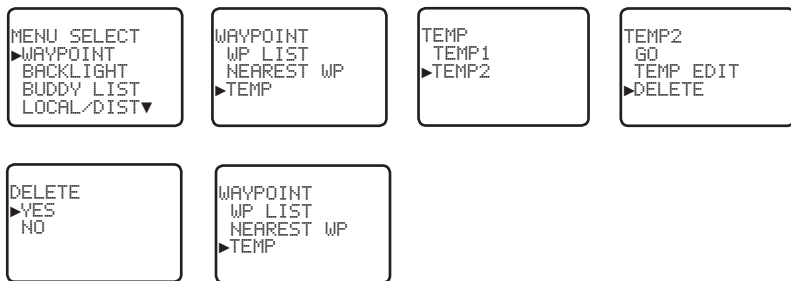
- Select WAYPOINT then TEMP.
- Your temporary waypoint list is displayed. There are 3 choices for quick access.
- Select the temporary waypoint to go to. Press ENT.
- Press ENT to set the temporary waypoint as the destination waypoint. It is immediately shown on the bottom line of the LCD.

**Tip:** Hold down MOB and release before the 3 second countdown completes. Your current LL position is stored in TEMP1 to TEMP3 in the waypoint list.

If the list is full, a message appears. See following section to delete a TEMP WP.



### 3-1-6 Edit or Delete a Temporary Waypoint



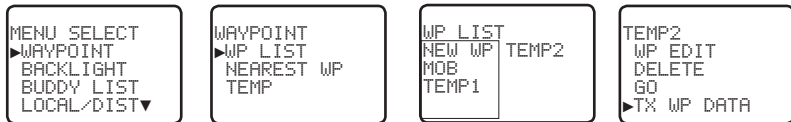
- Select WAYPOINT then TEMP. Your temporary waypoint list is displayed.
- Select the temporary waypoint to edit then select TEMP EDIT.

**Note:** To delete the temporary waypoint, select DELETE then YES. The temporary waypoint is deleted immediately and the temporary waypoint list is displayed again.

- The waypoint details are displayed. The cursor is at the first character of the name.
- Edit the temporary waypoint name **or** to edit only the latitude or longitude, press ENT repeatedly until the cursor moves to the required line.
- When you are finished, press ENT (repeatedly if necessary) until a new LCD appears.
- Press ENT to store the changes. The waypoint list is displayed again. If more changes are required, repeat steps 2 through 6. Otherwise, press EXIT.

### 3-1-7 Send Waypoint Data to a Chartplotter

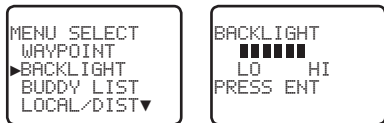
You can send waypoint data over NMEA 2000 to a compatible chartplotter.



- Select WAYPOINT then WP LIST. Your waypoint list is displayed. Press ENT. NEW WP starts to flash.
- Scroll down to the waypoint whose data you want to send to the chartplotter then press ENT. In the example scroll to TEMP2 then press ENT.
- Scroll down and select TX WPT DATA and press ENT to send the data.

### 3-2 Set the Backlighting Level (BACKLIGHT)

There are 8 levels of backlight. Level 8 is the brightest, Level 0 is OFF. The backlight function affects the base station (LCD and Keypad) and the microphone keypad backlight.



- Select BACKLIGHT.
- Select a comfortable level using the Channel Select knob or + or – on the microphone to change the setting.
- Press ENT to enable the setting and return to the menu.

**Note:** The DISTRESS key backlight cannot be switched off.

**Note:** If the backlight setting is set to level 0 (OFF), the backlight will automatically turn ON at level 1 if the radio detects any DSC activity, or any buttons are pressed. The backlight will return to level 0 (OFF) after 10 seconds of inactivity.

### 3-3 Maintain your buddy list (BUDDY LIST)

Use the buddy list to store the names and associated MMSIs of 20 favorite people. Names are stored in the order of entry, with the most recent entry shown first.

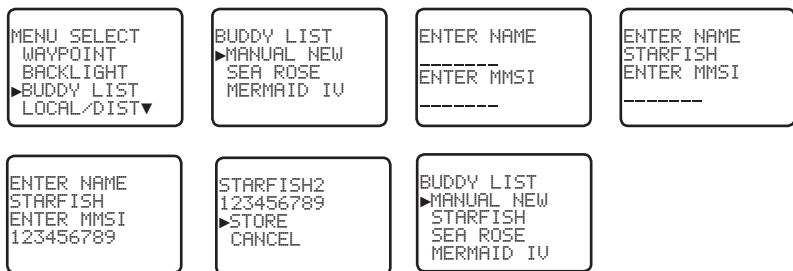
The following sections show how to add, edit and delete entries on your BUDDY LIST.

Section 7-3 explains how to call a buddy.

#### 3-3-1 Add an Entry

You can enter a maximum of 20 buddy names. When your BUDDY LIST is full, you cannot make a new entry until you have deleted an existing entry.

Each buddy name can have a maximum of 11 alphanumeric characters.



1. Select BUDDY LIST. The cursor is at MANUAL NEW. Press ENT.
2. Enter the buddy name, one character at a time (this may be alphanumeric) then press ENT repeatedly until the cursor moves to the MMSI entry line.
3. Enter the MMSI associated with that buddy name (this must be numeric) then press ENT.
4. The new buddy name and MMSI are displayed. Press ENT to store the new entry, which is displayed at the top of your buddy list.

**Note:** When the BUDDY LIST is full (20 entries), you can make a new entry and the buddy at the end of the list is automatically erased.

## 5. 3-3-2 Edit or Delete an Entry

```
MENU SELECT
WAYPOINT
BACKLIGHT
▶BUDDY LIST
LOCAL/DIST▼
```

```
BUDDY LIST
▶MANUAL NEW
SEA ROSE
MERMAID IV
```

```
BUDDY LIST
MANUAL NEW
▶SEA ROSE
MERMAID IV
```

```
SEA ROSE
▶EDIT
DELETE
```

```
EDIT NAME
SEA ROSE
EDIT MMSI
123456789
```

```
EDIT NAME
SEA ROSE 2
EDIT MMSI
122256798
```

```
SEA ROSE 2
122256798
▶STORE
CANCEL
```

1. Select BUDDY LIST. The cursor is at MANUAL NEW.
2. Scroll down to the incorrect entry and press ENT.
3. To delete the buddy, select DELETE then YES. The buddy is deleted immediately and the buddy list is displayed again.
4. To edit the buddy, select EDIT. The cursor is at the first character of the name. Edit the buddy name **or** to edit only the MMSI, press ENT repeatedly until the cursor moves to the MMSI line.
5. When you are finished, press ENT (repeatedly if necessary) until an updated screen appears.
6. Press ENT to store the changes. The buddy list is displayed again. If more changes are required, repeat steps 2 through 6. Otherwise, press EXIT to ESC.

## 3-4 Local or Distance Sensitivity (LOCAL/DIST)

---

Use LOCAL/DIST to improve the sensitivity of the receiver either locally (LOCAL) or over distances (DIST). LOCAL is not recommended for use in open sea conditions. It is designed for use in areas of high radio noise; for example, close to cities.

See also SQL (Squelch Control) in section 2.

### 3-4-1 Set Distance Sensitivity

```
MENU SELECT
BACKLIGHT ▲
BUDDY LIST
▶LOCAL/DIST
CONTRAST ▼
```

```
SENSITIVITY
▶DISTANT
LOCAL
```

1. Select LOCAL/DIST then select DISTANT.
2. Press ENT to activate the DIST setting. This disables local sensitivity and the menu is displayed again.

### 3-4-2 Set Local Sensitivity

```
MENU SELECT
BACKLIGHT ▲
BUDDY LIST
▶LOCAL/DIST
CONTRAST ▼
```

```
SENSITIVITY
DISTANT
▶LOCAL
```

1. Select LOCAL/DIST then scroll to LOCAL.
2. Press ENT to activate the LOCAL setting. This disables distance sensitivity and the menu is displayed again.

**LOCAL**

is displayed on the LCD as a reminder that sensitivity is reduced.

### 3-5 Set the Contrast Level (CONTRAST)

---

There are 8 levels of contrast.

```
MENU SELECT
BUDDY LIST▲
LOCAL/DIST
▶CONTRAST
GPS/DATA ▼
```

```
CONTRAST
■■■■
LO HI
PRESS ENT
```

1. Select CONTRAST.
2. Select a comfortable contrast level using the Channel Select knob or + or – on the microphone to change the setting.
3. Press ENT to enable the setting and return to the menu.

### 3-6 GPS Data and Time (GPS/DATA)

---

If the boat has an operational GPS navigation receiver and is connected by NMEA port, the VHF radio automatically detects and updates the vessel position and the local time.

However, if the GPS navigation receiver is disconnected or absent, you can specify the vessel position and the local time manually, using the GPS/DATA option.

This information is important because it will be used if a DSC distress call is transmitted.

- If GPS data is NOT available for some reason, the NO GPS alert will sound for 5 seconds (or until you press any key) and the radio requests you to enter the position data manually.
- This request is repeated every 4 hours if you do not enter the position data manually. After you have entered the position data manually, you must update it within 23.5 hours otherwise the NO GPS alert sequence repeats.
- The NO GPS warning will be shown whenever GPS data is not available from an operational GPS navigation receiver.



### 3-6-1 Manually Enter Position and UTC Time (MANUAL)

**Note:** this function is available only if an operational GPS receiver is **not** connected.



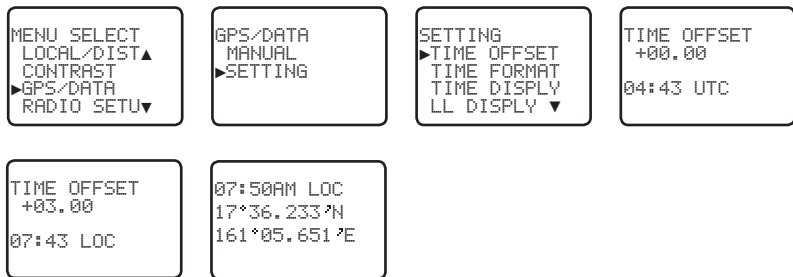
1. Select GPS/DATA then MANUAL.
2. Enter the latitude, then the longitude, then the UTC.
3. Press ENT when all the information is correct.

The vessel's latitude and longitude are shown on the screen, with the UTC time. The prefix M indicates a manual entry. The manual entries are cancelled if a real GPS position is received.

**Note:** a warning will be displayed after 4 hours to remind you that the current position information is manually entered.

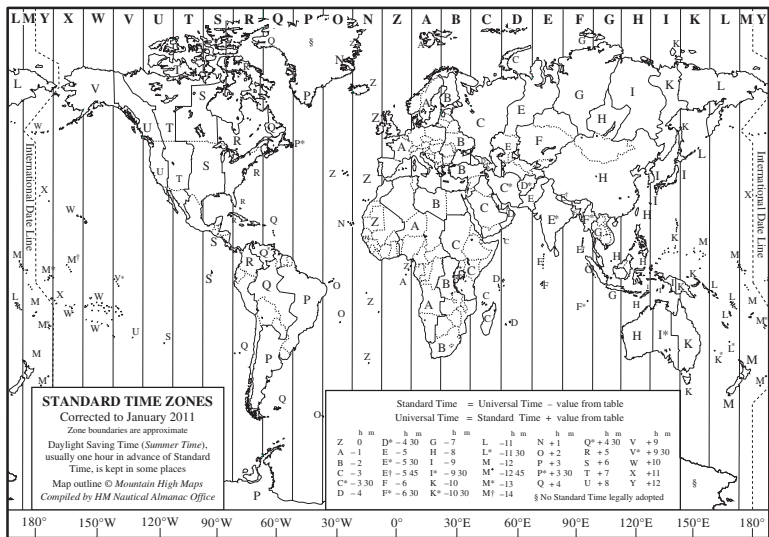
### 3-6-2 Local Time (TIME OFFSET)

If your position and time data are being updated through a GPS navigation receiver, you can enter the time difference between UTC and local time and display your local time on the LCD.



1. Work out the time difference between UTC and your local time (from the following graphic).
2. Select GPS/DATA then SETTING.
3. Select TIME OFFSET to enter the difference between UTC and local time. Use the Channel Select knob **or** + or - to change the time. Half hour increments can be used with a maximum offset of  $\pm 13$  hours.
4. Press ENT when the local time is correct.

LOC is displayed after the time on the LCD as a reminder that local time is selected.



WORLD MAP OF TIME ZONES

### 3-6-3 Time Format Options (TIME FORMAT)

Time can be shown in 12 or 24 hour format.

```

MENU SELECT
LOCAL/DIST▲
CONTRAST
▶GPS/DATA
RADIO SETU▼
  
```

```

GPS/DATA
MANUAL
▶SETTING
  
```

```

SETTING
TIME OFFSET
▶TIME FORMAT
TIME DISPLY
LL DISPLY ▼
  
```

```

TIME FORMAT
▶12 Hr
24 Hr
06:56PM LOC
  
```

1. Select GPS/DATA then SETTING.
2. Select TIME FORMAT.
3. Select 12 or 24 hr as desired. In this example, 12 hour format has been selected and so the LCD shows the AM or PM suffix.

### 3-6-4 Time Display Options (TIME DISPLY)

If your vessel position and time data are being updated through a GPS navigation receiver, you can show or hide the time on the LCD.

```
MENU SELECT
LOCAL/DIST▲
CONTRAST
▶GPS/DATA
RADIO SETU▼
```

```
GPS/DATA
MANUAL
▶SETTING
```

```
SETTING
TIME OFFSET
TIME FORMAT
▶TIME DISPLY
LL DISPLY ▼
```

```
TIME DISPLY
▶ON
OFF
```

1. Select GPS/DATA then SETTING.
2. Select TIME DISPLY.
3. Select ON (on) or OFF (off) as desired. In this example, OFF has been selected and the LCD no longer shows the time.

### **3-6-5 Position Display Options (LL DISPLY)**

If your vessel position and time data are being updated through a GPS navigation receiver, you can show or hide your vessel position on the LCD.

```
MENU SELECT
LOCAL/DIST▲
CONTRAST
▶GPS/DATA
RADIO SETU▼
```

```
GPS/DATA
MANUAL
▶SETTING
```

```
SETTING
TIME FORMAT
TIME DISPLY
▶LL DISPLY
COG/SOG
```

```
LL DISPLY
▶ON
OFF
```

1. Select GPS/DATA then SETTING.
2. Select LL DISPLY.
3. Select ON (on) or OFF (off) as desired. In this example, OFF has been selected and the LCD no longer shows the vessel position.

### **3-6-6 Course & Speed Display Options (COG/SOG)**

If your vessel position and time data are being updated through a GPS navigation receiver, you can show or hide your course over ground (COG) and speed over ground (SOG) data on the LCD.

```
MENU SELECT
LOCAL/DIST▲
CONTRAST
▶GPS/DATA
RADIO SETU▼
```

```
GPS/DATA
MANUAL
▶SETTING
```

```
SETTING
TIME DISPL▲
LL DISPLY
▶COG/SOG
GPS ALERT
```

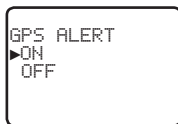
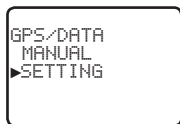
```
COG/SOG
ON
▶OFF
```

1. Select GPS/DATA then SETTING.
2. Select COG/SOG.
3. Select ON (on) or OFF (off) as desired. In this example, ON has been selected and so the LCD shows the bearing and speed.

### 3-6-7 GPS Alert (GPS ALERT)

If the GPS Alert is ON and the GPS navigation receiver is disconnected, the alarm sounds.

**Note:** The default setting is ON for the Link-8 EU and OFF for the Link-8 US.

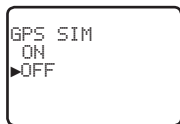


1. Select GPS/DATA then SETTING.
2. Select GPS ALERT.
3. Select ON (on) or OFF (off) as desired.

### 3-7 GPS Simulator (GPS SIM)

The GPS simulator is set to OFF whenever the radio is turned ON or whenever real GPS data is available through the COM port. (The GPS simulator will not operate if a GPS signal is received.)

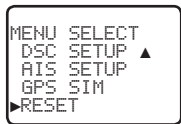
However, if you want to test it, turn it ON. Note that DSC transmissions will be blocked while the GPS simulator is ON.



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

### 3-8 Reset to Factory Defaults (RESET)

Use this to return every setting to the factory defaults except all MMSI settings and the entries in your buddy list.



1. Select RESET. The radio asks for confirmation.
2. Select YES then press ENT to confirm and reset the radio. The menu is displayed again.

## Section 4 - Radio Setup Menu (RADIO SETUP)

Hold down CALL / MENU key for about 1 second to access the following RADIO SETUP options.

The following menu options are explained in this section.

|                    |                       |                   |                      |
|--------------------|-----------------------|-------------------|----------------------|
| <b>RADIO SETUP</b> | <b>UIC *</b>          |                   | <b>Section 4-1</b>   |
|                    | <b>CH NAME</b>        |                   | <b>Section 4-2</b>   |
|                    | <b>RING VOLUME</b>    |                   | <b>Section 4-3</b>   |
|                    | <b>KEY BEEP</b>       |                   | <b>Section 4-4</b>   |
|                    | <b>UNITS</b>          |                   | <b>Section 4-5</b>   |
|                    | <b>INT SPEAKER</b>    |                   | <b>Section 4-6</b>   |
|                    | <b>WATCH MODE *</b>   |                   | <b>Section 4-7</b>   |
|                    | <b>WX ALERT *</b>     | <b>TONE ALERT</b> | <b>Section 4-8-1</b> |
|                    |                       | <b>SAME ALERT</b> | <b>Section 4-8-2</b> |
|                    |                       | <b>SAME CODE</b>  | <b>Section 4-8-3</b> |
|                    | <b>COM PORT</b>       |                   | <b>Section 4-9</b>   |
|                    | <b>GPS SOURCE</b>     |                   | <b>Section 4-10</b>  |
|                    | <b>FAV CH SETUP *</b> |                   | <b>Section 4-11</b>  |

\* Model dependant

See sections 1-3 and 1-4 if you want to know how to move around the menu and enter, save and change data.

### 4-1 Channel (UIC)

*US and AUS models only.*

Toggle between USA, International, or Canadian channel banks. The selected channel bank is displayed on the LCD along with the last used channel. All the channel charts are shown in Appendix C.



1. Select RADIO SETUP then UIC.
2. Select the desired channel bank then press ENT.

### 4-2 Channel Names (CH NAME)

The channel charts are listed in Appendix C with their default name tags. CH NAME gives you the option to edit or delete the channel name tags displayed on the LCD.

In this example, the channel name tag PHONE-PORTOP associated with channel 87 is being changed to CALL PORT OP.

```
RADIO SETUP
UIC
▶CH NAME
RING VOLUME
KEY BEEP ▼
```

```
63
CH NAME
PHONE-PORTOP
```

```
PHONE-PORTOP
▶EDIT
DELETE
```

```
EDIT CH NAME
PHONE-PORTOP
```

```
SAVE CH NAME
CALL PORTOP
▶YES
NO
```

1. Select RADIO SETUP then CH NAME. Use the Channel Select knob **or** + or - to step through the channel name tags until you see the one you want to change then press ENT.
2. To delete the channel name, select DELETE and press ENT.
3. To edit the channel name, select EDIT to edit the existing name tag.
4. Input the new name over the existing name. It can be a maximum of 12 characters.
5. Press ENT (repeatedly is necessary) to display the YES/NO confirmation.
6. Press ENT to confirm the new channel name tag (or the deletion).
7. Press EXIT to return to the CH NAME screen.

### 4-3 Ring Volume (RING VOLUME)

---

The radio sounds the friendly two-tone alert when it detects an incoming DSC call. You can change the volume level.

```
RADIO SETUP
UIC
CH NAME
▶RING VOLUME
KEY BEEP ▼
```

```
RING VOLUME
▶HIGH
LOW
```

1. Select RADIO SETUP then RING VOLUME.
2. Select HIGH (loud) or LOW (soft) then press ENT.

### 4-4 Key Beep Volume (KEY BEEP)

---

You can change the key beep volume or turn the key beeps off completely.

```
RADIO SETUP
CH NAME ▲
RING VOLUME
▶KEY BEEP
UNITS ▼
```

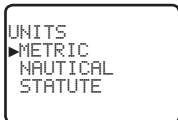
```
KEY BEEP
HIGH
▶LOW
OFF
```

1. Select RADIO SETUP then KEY BEEP.
2. Select the desired setting then press ENT.

## 4-5 Select Units (UNITS)

---

You can select your preferred measurement units for distance and cross track error (for waypoint navigation).



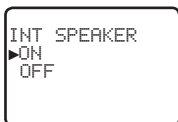
1. Select RADIO SETUP then UNITS.
2. Select your preferred measurement units then press ENT.

**Note:** Nautical Miles is the only unit used in AIS mode.

## 4-6 Internal Speaker Connections (INT SPEAKER)

---

You can switch the radio's internal speaker ON or OFF. The external speaker is always ON if a speaker is plugged into the external speaker jack.



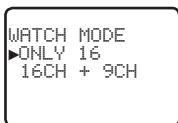
1. Select RADIO SETUP then INT SPEAKER.
2. Select ON (on) or OFF (off) then press ENT to enable the setting and return to the menu.

## 4-7 Set the Priority Channel (WATCH MODE)

---

*US model only.*

If you are operating on the USA or Canadian channel banks, you can set the priority channel to cover both CH16 and CH09 as well as the working channel, similar to a TRI WATCH.



1. Select RADIO SETUP then WATCH MODE.
2. Select the desired setting then press ENT.

## 4-8 Weather Alerts (WX ALERT)

US model only.

Use WX ALERT to set your preferences for weather alert information.

The NOAA provides several weather forecast channels on USA and Canadian channel banks. If severe weather such as storms or hurricanes are forecast, the NOAA broadcasts a weather alert on 1050 Hz.

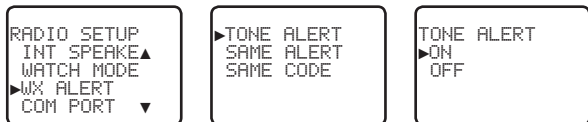
The NOAA All Hazards Weather Radio Service (NWR) works in conjunction with the Emergency Alert System (EAS) to issue weather alerts for specific geographic areas or specific weather conditions. It uses a digital encoding system known as SAME (Specific Area Message Encoding) to broadcast these alerts.


Each transmitter in the NOAA All Hazards Weather Radio Service (NWR) network is identified with a unique 6-digit SAME code. Each transmitter operates on one of 7 frequencies.

**Note:** To activate a SAME alert, a SAME CODE (county ID) must be selected and turned ON (see section 4-8-2).

### 4-8-1 TONE ALERT

If TONE ALERT is ON and an alert tone of 1050 Hz is broadcast from the NOAA weather station, the weather alert is picked up automatically and the alarm sounds. Press any key to cancel the alarm and to hear the weather alert message.



1. Select RADIO SETUP then WX ALERT.
2. Select TONE ALERT.
3. Select ON to hear any weather alerts on 1050 Hz - the TONE ALERT symbol  will be displayed on the LCD **or**, to ignore these weather alerts, select OFF.

### 4-8-2 SAME ALERT

**Note:** SAME ALERT works only after you have entered and selected a SAME code for your geographic area (see Section 4-8-5 and 4-8-6).

**Note:** SCAN mode will operate up to 50% more slowly when SAME ALERT is ON to allow time to decode the special warning code transmissions.



RADIO SETUP  
INT SPEAKE▲  
WATCH MODE  
▶WX ALERT  
COM PORT ▼

▶TONE ALERT  
▶SAME ALERT  
SAME CODE

SAME ALERT  
ON  
▶OFF

1. Select RADIO SETUP then WX ALERT.
2. Select SAME ALERT.
3. Select ON to receive any local NWR or EAS alerts - the SAME ALERT symbol **SAME** will be displayed on the LCD **or**, to ignore these weather alerts, select OFF.

### **4-8-3 Receiving a SAME ALERT**

If SAME ALERT alert is ON and an NWR or EAS alert for your geographic area is broadcast by the NOAA NWR transmitters, the alert is picked up automatically and the alarm sounds. Press any key to cancel the alarm.

If the alert is being sent by NOAA NWR, the radio automatically tunes to the designated frequency so that you can listen to the alert.

If the alert is being sent by the EAS, the nature of the alert is shown on the LCD as WARNING, WATCH, ADVISORY, or TEST.

Press any key to show the nature of the alert. (The list of alerts is shown in Appendix C.)

### **4-8-4 Receiving SAME TEST Messages**

In addition to the WARNING, WATCH and ADVISORY alerts, the EAS also send out TEST messages so that you can check your WX ALERT setup is working correctly. The TEST message is usually transmitted between 1000 and 1200 (10.00AM and noon) every Wednesday.

**Note:** If there is a threat of severe weather, the test is postponed until the next good weather day.

If your WX ALERT setup is working correctly, the alert sounds and TEST is displayed on the LCD, followed by a broadcast message from the National Weather Service.

### **4-8-5 Enter a SAME CODE (County ID)**

If you want to receive SAME weather alerts, you must enter and then Select a SAME code for your geographic area into your radio. You can enter a maximum of 4 SAME codes (4 counties) in your geographic area.

Telephone 1-888-NWR-SAME (1-888-697-7263) or visit [www.nws.noaa.gov/nwr/indexnw.htm](http://www.nws.noaa.gov/nwr/indexnw.htm) to find the SAME codes for your geographic area (you must be within the United States of America, Puerto Rico, the U.S. Virgin Islands and U.S. Pacific Territories).

```
RADIO SETUP
INT SPEAKE▲
WATCH MODE
▶WX ALERT
COM PORT ▼
```

```
WX ALERT
TONE ALERT
SAME ALERT
▶SAME CODE
```

```
SAME CODE
▶NEW CODE
```

```
INPUT SAME
CODE
-----
```

```
SAME CODE
012011
▶STORE
CANCEL
```

```
SAME CODE
▶NEW CODE
0122003
```

1. Select RADIO SETUP then WX ALERT.
2. Select SAME CODE. If you have already entered any SAME codes, they are listed on the LCD.
3. Select NEW CODE. Enter the new SAME code along the dashed line, one number at a time. Press ENT to confirm each correct entry and to move to the next digit.  
If you make an error, press – until < appears, then press ENT to backup and correct the entry.
4. Press ENT to store the SAME code.
5. Repeat if necessary to enter a maximum of 10 SAME codes.

#### **4-8-6 Select a Working SAME code**

You must select a SAME code for your geographic working area that you have previously entered into the radio in order to receive SAME weather alerts:

```
RADIO SETUP
INT SPEAKE▲
WATCH MODE
▶WX ALERT
COM PORT ▼
```

```
WX ALERT
TONE ALERT
SAME ALERT
▶SAME CODE
```

```
SAME CODE
NEW CODE
▶012203
017093
```

```
012203
EDIT
DELETE CODE
▶SELECT CODE
```

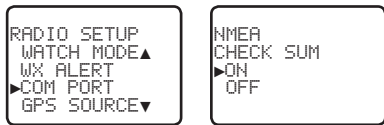
```
SELECT CODE
012203
▶YES
NO
```

1. Select RADIO SETUP then WX ALERT.
2. Select SAME CODE. If you have already entered any SAME codes, they are listed on the LCD.
3. Select the SAME# for your geographic area (0122003 in the above example) and press ENT.
4. Choose SELECT CODE. Then select YES.

## 4-9 NMEA Protocol (COM PORT)

---

The COM PORT must be configured correctly before use. The radio can be added to a group of instruments using NMEA protocol.



1. Select RADIO SETUP then COM PORT.
2. Select the desired setting then press ENT.

CHECK SUM ON (on) is the usual setting.

The COM PORT uses 4800 baud rate and can receive the following GPS data sentences: RMC, GGA, GLL, GNS. Additionally, the radio will output the following NMEA DSC data: DSC (for DSC call), DSE (for enhanced position).

## 4-10 Select the GPS Source (GPS SOURCE)

---

This radio can use either NMEA0183 or NMEA2000 protocol to receive GPS data from a compatible GPS unit.

**Note:** NMEA 2000 SOURCE options will appear (up to 4 sources showing the actual source name) only if an NMEA 2000 network is connected to the radio and is operational.



1. Select RADIO SETUP then GPS SOURCE. (If there is only one NMEA protocol available on your vessel, only that will be shown.)
2. Select the desired NMEA source then press ENT.

## 4-11 Favourite Channel Setup - Wx Key (FAV CH SETU)

---

*EU and AUS models only.*

The Wx key can be programmed to a weather channel of your choice so that you have quick access to that channel.

1. Select RADIO SETUP then FAV CH SETU.
2. Rotate the CH knob or press UP/DOWN key to select a channel that you want to save it as the WX favorite channel, then press ENT to save with WX icon lighting to indicate.

## Section 5 - DSC Setup Menu (DSC SETUP)



### WARNING

A valid USER MMSI must be entered into the radio before these DSC functions can be used. See Section 5-1 for instructions on entering your USER MMSI.

Hold down CALL / MENU key for about 1 second to access the following DSC SETUP options. The following menu options are explained in this section.

| DSC SETUP | USER MMSI             |  | Section 5-1  |
|-----------|-----------------------|--|--------------|
|           | GROUP SETUP           |  | Section 5-2  |
|           | ATIS MMSI (EU only)   |  | Section 5-3  |
|           | ATIS SELECT (EU only) |  | Section 5-4  |
|           | INDIV REPLY           |  | Section 5-5  |
|           | DSC FUNC              |  | Section 5-6  |
|           | LL REPLY              |  | Section 5-7  |
|           | AUTO SWITC            |  | Section 5-8  |
|           | TEST REPLY            |  | Section 5-9  |
|           | TIMEOUT               |  | Section 5-10 |

See sections 1-3 and 1-4 if you want to know how to move around the menu and enter, save and change data.

### 5-1 Enter or View Your USER MMSI (USER MMSI)

This is a **once-only** operation. You must enter your user MMSI before you can access the DSC functions.

You can display and read your user MMSI at any time, but you get only one opportunity to enter your user MMSI.

The user MMSI (Marine Mobile Service Identity) is a unique 9 digit number, similar to a personal telephone number. It is used on marine transceivers that are capable of using DSC (Digital Select Calling).

Contact the appropriate authorities in your country to obtain your user MMSI. If you are unsure who to contact, consult your Lowrance dealer.

```
DSC SETUP
▶USER MMSI
GROUP SETUP
ATIS MMSI
ATIS SELEC▼
```

```
INPUT USER
MMSI
-----
```

```
USER MMSI
876543210
▶STORE
CANCEL
```

```
USER MMSI
INPUT AGAIN
-----
```

```
USER MMSI
876543210
▶STORE
CANCEL
```

```
DSC SETUP
▶USER MMSI
GROUP SETUP
ATIS MMSI
ATIS SELEC▼
```

```
VIEW MMSI
876543210
```

1. Select DSC SETUP, then USER MMSI.  
If you have already entered your MMSI, it is shown on the LCD.
2. If this is the **first time** that you are entering your MMSI, a dashed line appears.  
Enter your MMSI along the dashed line, one number at a time. Press ENT to confirm each correct entry and to move to the next digit.  
If you make an error, press – until < appears, then press ENT to backup and correct the entry.
3. Press ENT to store your user MMSI.
4. Enter your user MMSI again as a password check, then press ENT to permanently store the user MMSI and return to the menu.
5. You can view your stored user MMSI at anytime by selecting USER MMSI in the main menu.

## 5-2 Maintain Your Groups

---

Use GROUP SETUP to create, edit, or delete 1, 2, or up to 20 groups of frequently called people stored in alphanumeric order. A group MMSI always starts with 0.

### 5-2-1 Create a Group (GROUP SETUP)

```
DSC SETUP
USER MMSI
▶GROUP SETUP
ATIS MMSI
ATIS SELEC▼
```

```
GROUP SETUP
>MANUAL NEW
```

```
GROUP NAME
-----
GROUP MMSI
0-----
```

```
FISHING 1
012345678
▶STORE
CANCEL
```

1. Select DSC SETUP then GROUP SETUP.
2. Select MANUAL NEW.
3. If this is the **first time** that you are entering a group name, a dashed line appears
4. Enter the group name along the dashed line. It can be a maximum of 12 alphanumeric characters. Press ENT to confirm each correct entry and to move to the next position.  
If you make an error, press – until < appears, then press ENT to backup and correct the entry.
5. Enter the group MMSI. (Note that the first number is always a 0.) Press ENT.
6. The group name and group MMSI are shown in a confirmation screen. Press ENT to store the details and return to the GROUP SETUP screen.

## 5-2-2 Edit or Delete a Group Name or Group MMSI (GROUP SETUP)

You can edit a group name or group MMSI at any time.

```
DSC SETUP
USER MMSI
▶GROUP SETUP
ATIS MMSI
ATIS SELEC▼
```

```
GROUP SETUP
MANUAL NEW
▶FISHING 1
SAILING
```

```
FISHING 1
012345678
▶EDIT
DELETE
```

```
EDIT NAME
FISHING 1
ENTER MMSI
012345678
```

```
FISHING 1
012345678
▶STORE
CANCEL
```

1. Select DSC SETUP then GROUP SETUP. The existing group names are displayed.
2. Select the group you want to edit. Press ENT.
3. To delete the group, select DELETE then YES. The group is deleted immediately and the group list is displayed again.
4. To edit the group, select EDIT.
5. Edit the group name OR to edit only the MMSI, press ENT repeatedly until the cursor moves to the MMSI line.
6. When you are finished, press ENT (repeatedly if necessary) until a new LCD appears.
7. Press ENT to store the changes and return to the GROUP SETUP screen.

## 5-3 Enter or check your ATIS MMSI (ATIS MMSI)

---

*EU models only.*

You must enter your ATIS MMSI to access ATIS functionality if you are navigating inland waterways within Europe.

- ATIS sends a digital message any time that you release the PTT key. Inland waterways rules require 1 W Tx power on Channels 06, 08, 10, 11, 12, 13, 14, 15, 17, 71, 72, 74, and 77.
- An ATIS MMSI always starts with the number 9.
- This is a **once-only** operation. You must enter your ATIS MMSI before you can access the ATIS functions.
- You can display and read your ATIS MMSI at any time, but you get only one opportunity to enter your ATIS MMSI.

1. Select DSC SETUP then ATIS MMSI.

If you have already entered your ATIS MMSI, it is shown on the LCD.

```
DSC SETUP
USER MMSI
GROUP SETUP
▶ATIS MMSI
ATIS SELEC▼
```

```
INPUT ATIS
MMSI
9-----
```

```
ATIS MMSI
9987654321
▶STORE
CANCEL
```

```
ATIS MMSI
INPUT AGAIN
9-----
```

```
ATIS MMSI
9987654321
▶STORE
CANCEL
```

- If this is the **first time** that you are entering your ATIS MMSI, a dashed line appears. Enter your ATIS MMSI along the dashed line. The first number is always 9. Press ENT to confirm each correct entry and to move to the next digit.  
If you make an error, press – until < appears then press ENT to backup and correct the entry.
- Press ENT to store the ATIS MMS.
- Enter your ATIS MMSI again as a password check, then press ENT to permanently store the ATIS MMSI and return to the menu.
- You can view your stored ATIS MMSI at any time by selecting ATIS MMSI in the main menu.

#### **5-4 Enable ATIS functionality (ATIS SELECT)**

---

*EU models only.*

ATIS functionality will operate only after the ATIS MMSI has been entered (see previous section).

When ATIS functionality is enabled, the ATIS symbol  is shown on the LCD.

```
DSC SETUP
GROUP SETUP
ATIS MMSI
▶ATIS SELECT
INDIV REPL▼
```

```
ATIS SELECT
▶ON
OFF
```

- Select DSC SETUP then ATIS SELECT.
- Select OFF to disable ATIS functionality or select ON to enable the ATIS functionality - DSC must be turned off first.
- Press ENT to confirm.

**Note:** It is not possible to have both ATIS ON (on) and DSC ON (on) simultaneously. If you want to activate ATIS, you must first switch DSC off. A warning will remind you if DSC is already ON.

## 5-5 Response to Individual Calls (INDIV REPLY)

---

You can respond to incoming individual calls with an automatic response or with a manual response.

An automatic response sends an acknowledgement and then sets the request link channel, ready for a conversation.

A manual response asks if you want to acknowledge the call, and then asks if you want to converse with the caller.

1. Select DSC SETUP, then INDIV REPLY.
2. Select AUTO for an automatic response, or MANUAL for a manual response.
3. Press ENT to confirm your choice and return to the menu.

```
DSC SETUP
GROUP SETU▲
ATIS MMSI
ATIS SELECT
▶INDIV REPL▼
```

```
INDIV REPLY
MANUAL
▶AUTO
```

## 5-6 Enable DSC functionality (DSC FUNC)

---

DSC functionality will operate only after a valid USER MMSI has been entered - see 5-1.

When DSC functionality is selected, the DSC symbol **DSC** is shown on the LCD.

```
DSC SETUP
ATIS MMSI ▲
ATIS SELECT
INDIV REPLY
▶DSC FUNC ▼
```

```
DSC FUNC
▶ON
OFF
```

1. Select DSC SETUP then DSC FUNC.
2. Select OFF to disable DSC functionality or select ON to enable the DSC functionality - ATIS (if applicable) must be turned off first.

**Note:** Disabling DSC functionality is not recommended.

3. Press ENT to confirm.

**Note:** It is not possible to have both ATIS ON (on) and DSC ON (on) simultaneously. If you want to activate DSC, you must first switch ATIS off. A warning will remind you if ATIS is already ON.

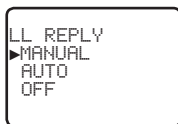


## 5-7 Response Type to LL Polling Calls (LL REPLY)

---

You can set up the radio to respond to an LL polling request in one of three ways:

- **MANUAL** reply manually to any incoming LL polling requests from your buddies.
- **AUTO** automatically replies to any incoming LL polling requests from any of your buddies.
- **OFF** ignores all incoming buddy LL polling requests.



1. Select DSC SETUP then LL REPLY.
2. Select your response and press ENT to confirm and return to the menu.

## 5-8 Automatic Channel switching (AUTO SWITCH)

---

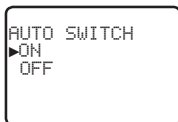
When a DSC call is received, it may include a request to change to a specific channel for subsequent communications. If a channel switch request is included, your options are:

- allow the radio to switch to the requested channel immediately by pressing the ENT button, or
- do nothing to allow the radio to automatically switch to the requested channel after a delay of 10 seconds, or
- cancel the automatic switch and remain on the current channel by pressing the EXIT button.

However, automatic switching to a subsequent communications channel on receipt of a DSC call might in some cases disrupt important ongoing communications if the working channel changes without the operator knowing.

You can prevent the radio from automatically switching from the current working channel by setting the AUTO SWITCH feature to OFF.

If the AUTO SWITCH feature is set to OFF, an **X** will be displayed on the LCD to remind you that this feature is set to off. Additionally, the text "AUTO SW OFF" will be included in an All Ships or Group call replacing the text "AUTO CHxx"



1. Select DSC SETUP, then AUTO SWITCH.
2. Select ON (on) to enable automatic channel switching.
3. Select OFF (off) to disable automatic channel switching.

## 5-9 DSC Test Reply (TEST REPLY)

---

You can respond to incoming DSC TEST calls with an automatic response or with a manual response.

- **MANUAL** manual response is required, press ENT to confirm or press EXIT to cancel.
- **AUTO** automatically replies after a 10 second delay with an ACK to any incoming DSC TEST call.

```
DSC SETUP
LL REPLY ▲
AUTO SWITC
▶TEST REPLY
TIMEOUT
```

```
TEST REPLY
▶AUTO
MANUAL
```

## 5-10 Set the inactivity timer (TIMEOUT)

---

You can set the inactivity timer with the following options:

- **AUTOMATED** you can set the inactivity timer to automatically timeout after a period of inactivity for the following two categories: NON-DISTRESS or DISTRESS  
Timeout options are:  
DISTRESS: NO TIMEOUT; 5 MINS; 10 MINS (default is NO TIMEOUT)  
NON-DISTR: NO TIMEOUT; 10 MINS; 15 MINS (default is 15 MINS)
- **NON AUTO** you can set the inactivity timer to exit any non-automated procedure activity.  
Timeout options are:  
NO TIMEOUT; 10 MINS; 15 MINS (default is 10 MINS)

**Note:** If NO TIMEOUT is selected, then you must press the EXIT key to exit the procedure.

**Example:** to set a 10 minute TIMEOUT for non-automated functions:

1. Select TIMEOUT, then select NON AUTO
2. Select desired timeout period: NO TIMEOUT, 10 MINS or 15 MINS

```
DSC SETUP
LL REPLY ▲
AUTO SWITC
TEST REPLY
▶TIMEOUT
```

```
TIMEOUT
▶AUTOMATED
NON AUTO
```

```
NON AUTO
NO TIMEOUT
▶10 MINS
15 MINS
```

In this example, 10 MINS has been selected, meaning the radio will exit any non-automated procedure after a period of 10 minutes of non-activity.


## Section 6 - AIS Setup Menu (AIS SETUP)

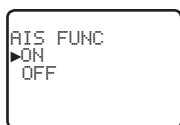
Hold down CALL / MENU key for about 1 second to access the following AIS SETUP options. The following menu options are explained in this section.

|                  |                    |  |                    |
|------------------|--------------------|--|--------------------|
| <b>AIS SETUP</b> | <b>AIS FUNC</b>    |  | <b>Section 6-1</b> |
|                  | <b>AIS DISPLAY</b> |  | <b>Section 6-2</b> |
|                  | <b>BAUD RATE</b>   |  | <b>Section 6-3</b> |
|                  | <b>GPS REDIR</b>   |  | <b>Section 6-4</b> |
|                  | <b>CPA ALARM</b>   |  | <b>Section 6-5</b> |
|                  | <b>CPA</b>         |  | <b>Section 6-6</b> |
|                  | <b>TCPA</b>        |  | <b>Section 6-7</b> |

See sections 1-3 and 1-4 if you want to know how to move around the menu and enter, save and change data.

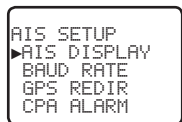
### 6-1 Enable AIS functionality (AIS FUNC)

The AIS function can be turned ON or OFF. When AIS functionality is selected, the AIS symbol  is shown on the LCD.



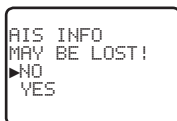
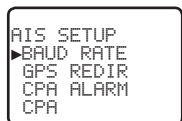
### 6-2 AIS data display format (AIS DISPLAY)

When viewing the AIS plotter screen, AIS targets can be displayed with the vessels name or the vessels MMSI.



### 6-3 AIS Baud Rate (BAUD RATE)

AIS data can be output to a compatible chart-plotter / MFD or PC via the NMEA port. The NMEA port baud rate can be set to 4800 or 38400. The default setting is 38400. If 4800 is selected, a warning that data may be lost is displayed.



## 6-4 GPS Redirection (GPS REDIR)

---

GPS redirection option set to output the GPS information to the chart plotter eliminating the need for an additional multiplexer.

If "yes" is selected, the string \$RMC will be redirected to the chart plotter once it is received.

**Note:** The REDIR function will only redirect RMC and GLL messages from NMEA0183 input port to the AIS output port.

```
AIS SETUP
GPS REDIR
CPA ALARM
CPA
TCPA
```

```
GPS REDIR
▶NO
YES
```

## 6-5 Closest Point of Approach alarm (CPA ALARM)

---

Enables the CPA alarm. If set to OFF, there will be no T/CPA alarms regardless of the settings.

```
AIS SETUP
GPS REDIR
▶CPA ALARM
CPA
TCPA
```

```
CPA ALARM
▶ON
OFF
```

## 6-6 Closest Point of Approach settings (CPA)

---

CPA is the minimum distance between you and a target vessel based on the current speed and course. You can set the minimum distance for CPA alarm to sound (1NM to 30NM).

Rotate the dial to set the CPA distance in 1NM increments. Press ENT when done.

```
AIS SETUP
GPS REDIR
CPA ALARM
▶CPA
TCPA
```

```
CPA
▶01NM
```

## 6-7 Time to Closest Point of Approach (TCPA)

---

TCPA is the minimum time of intercept between you and a target vessel based on the current speed and course. Set the minimum time for the TCPA alarm to sound (5Min to 30Min).

Rotate the dial to set the TCPA time in 30sec increments. Press ENT when done.

```
AIS SETUP
GPS REDIR
CPA ALARM
CPA
▶TCPA
```

```
TCPA
▶05:00Min
```

## Section 7 - Sending and Receiving DSC Calls



A valid USER MMSI must be entered into this radio before these DSC functions can be used. See section 5-1.

### 7-1 What is DSC?

DSC (Digital Selective Calling) is a semi-automated method of establishing VHF, MF, and HF radio calls. It has been designated as an international standard by the IMO (International Maritime Organization) and is part of the GMDSS (Global Maritime Distress and Safety System).

Currently, you are required to monitor Distress Channel 16, but DSC will eventually replace listening watches on distress frequencies and will be used to broadcast routine and urgent maritime safety information.

DSC enables you to send and receive calls from any vessel or coast station that is equipped with DSC functionality and within geographic range. Calls can be categorized as distress, urgency, safety, or routine, and DSC selects a working channel automatically.

### 7-2 Sending DSC Calls

You can call any other person that has another DSC equipped radio.

- Quick press the CALL / MENU key to access the following DSC CALL menu options – select LAST CALL to quickly call back the person who called you.
- Note that only four DSC CALL menu options can be shown on the LCD at any one time.
- Press + or – on the microphone **or** turn the Channel Select knob on the base station to scroll up or down through the menu until the cursor is positioned at the desired option. Press ENT (the center of the Channel Select knob) to display that option.

The following options are available:

|                 |                    |                               |              |
|-----------------|--------------------|-------------------------------|--------------|
| <b>DSC CALL</b> | <b>INDIVIDUAL</b>  | Make a DSC Call               | Section 7-3  |
|                 | <b>LAST CALL</b>   | Repeat the last DSC Call      | Section 7-5  |
|                 | <b>GROUP</b>       | Make a Group DSC Call         | Section 7-6  |
|                 | <b>ALL SHIPS</b>   | Make an All Ships DSC Call    | Section 7-7  |
|                 | <b>CALL LOG</b>    | View DSC Call Log             | Section 7-8  |
|                 | <b>DISTR LOG</b>   | View DSC Distress Log         | Section 7-9  |
|                 | <b>SENT CALL</b>   | View DSC Sent Call Log        | Section 7-10 |
|                 | <b>LL REQUEST</b>  | Request a position report     | Section 7-11 |
|                 | <b>TRACK BUDDY</b> | Automatically track Buddy's   | Section 7-12 |
|                 | <b>DSC TEST</b>    | Make a DSC Test Call          | Section 7-13 |
|                 | <b>MMSI/GPS</b>    | View MMSI and GPS information | Section 7-14 |

## 7-3 Send an Individual Call (INDIVIDUAL)

### Call to a Buddy

```
DSC CALL
▶INDIVIDUAL
LAST CALL
GROUP
ALL SHIPS ▼
```

```
INDIVIDUAL
▶ROUTINE
SAFETY
URGENCY
```

```
INDIVIDUAL
MANUAL NEW
▶MERMAID IV
SEAROSE
```

```
CHOOSE CH
▶INTER-SHIP
MANUAL
```

```
MERMAID IV
INDIVIDUAL
ROUTINE
▶SET INTER
```

```
MERMAID IV
INDIVIDUAL
ROUTINE
▶SEND?
```

```
MERMAID IV
INDIVIDUAL
ROUTINE
WAIT.. 00:00
```

```
INDIVIDUAL
ROUTINE
ACK FROM
MERMAID IV
▼ 00:00
```

### Call to others

```
DSC CALL
▶INDIVIDUAL
LAST CALL
GROUP
ALL SHIPS ▼
```

```
INDIVIDUAL
▶ROUTINE
SAFETY
URGENCY
```

```
INDIVIDUAL
▶MANUAL NEW
MERMAID IV
SEAROSE
```

```
MANUAL MMSI
0-----
```

```
CHOOSE CH
▶INTER-SHIP
MANUAL
```

```
678912345
INDIVIDUAL
ROUTINE
▶SEND?
```

```
678912345
INDIVIDUAL
ROUTINE
CALLING...
```

```
678912345
INDIVIDUAL
ROUTINE
WAIT.. 00:00
```

1. Select DSC CALL then INDIVIDUAL.
2. Select the priority level: ROUTINE, SAFETY, URGENCY.
3. Select the buddy you want to call from your buddy list - **or** Select MANUAL NEW then enter the MMSI of the individual you want to call and press ENT.
4. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice. If the call is to a Coast Station (MMSI begins with 00) the radio will recognize this and specify the correct channel to talk on.
5. Press ENT to SEND the call. Channel 70 is selected automatically and the Tx symbol is shown on the LCD while the call is being sent.
6. The radio waits for an acknowledgement (WAIT). If the call is acknowledged (INDIV ACK) press PTT to talk. Rotate the Channel Select knob to view additional options.
7. If there is no reply (UNABLE TO ACKNOWLEDGE) a message asks if you want to retry (SEND AGAIN?). Press ENT to retry the call.

## 7-4 Acknowledgement of an Individual Incoming Call (INDIV)

---

When an incoming call is received, the alarm sounds for 2 minutes and INDIVIDUAL is displayed.

```
INDIVIDUAL
ROUTINE FROM
123456789
NO AUTO SW
▼ 00:01
```

```
ROUTINE FROM
123456789
NO AUTO SW
CH12 REQUEST
▲▼ 00:02
```

```
123456789
NO AUTO SW
CH12 REQUEST
12:45 UTC
▲ 00:03
```

1. Press **SILENC** soft key (AIS/IC key) to silence the alert.
2. Press +/- button or rotate the CH knob to scroll any further information about the call.
3. Press **NEW-CH** soft key (AIS/IC key) to request a different working channel, or press **ABLE** soft key (WX/NAV key) to acknowledge the call.
4. Or press EXIT to return to standby.

## 7-5 Reply to the Last Call (LAST CALL)

---

This facility is useful and used frequently.

```
DSC CALL
INDIVIDUAL
▶LAST CALL
GROUP
ALL SHIPS ▼
```

```
SEAROSE
INDIVIDUAL
ROUTINE
10:22AM LOC
```

```
CHOOSE CH
▶INTER-SHIP
MANUAL
```

```
SEAROSE
INDIVIDUAL
ROUTINE
▶SEND?
```

1. Select DSC CALL then LAST CALL.
2. The contact details of the most recent incoming call are displayed. Press ENT.
3. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice. If the call is to a Coast Station (MMSI begins with 00) the radio will recognize this and specify the correct channel to talk on.
4. The call details are shown. Press ENT to send the call. The Tx symbol is displayed on the LCD while the call is being sent.
5. If the call is acknowledged (INDIV ACK) press PTT to talk. If there is no reply a message asks if you want to retry (SEND AGAIN?). Press ENT to retry the call.

## 7-6 Send a Group Call (GROUP)

You must already have stored a GROUP MMSI before making the call - see Section 5-2. Group calls are always sent with ROUTINE priority.



1. Select DSC CALL then GROUP.  
The radio displays the names of your pre-programmed groups.
2. Select the group that you want to call (the GROUP MMSI must be set before making the call).
3. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice.
4. The call details are shown. Press ENT to send the call. The Tx symbol is displayed on the LCD while the call is being sent.

## 7-7 Send an All Ships Call (ALL SHIPS)



1. Select DSC CALL then ALL SHIPS.
2. Select one of the following call priorities:
  - **SAFETY** To send safety information to all other vessels in range.
  - **URGENCY** For use when a serious situation or problem arises that could lead to a distress situation.
3. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice.
4. The call details are shown. Press ENT to send the call. The Tx symbol is displayed on the LCD while the call is being sent.



## 7-8 Send Using the Call Log (CALL LOG)

The Call Log contains the contact details for the 20 most recent incoming calls, so that you can call any of them again quickly.

When the call log is full, the oldest entry is overwritten.

```
DSC CALL
GROUP      ▲
ALL SHIPS
▶CALL LOG
DISTR LOG  ▼
```

```
11 12345678
INDIVIDUAL
ROUTINE
09:45 UTC
```

```
11 12345678
▶CALL BACK
DELETE
SAVE MMSI
```

```
CHOOSE CH
▶INTER-SHIP
MANUAL
```

```
12345678
INDIVIDUAL
ROUTINE
▶SEND?
```

1. Select DSC CALL then CALL LOG.
2. The radio displays the contact details for the most recent incoming call as the first entry (01) in the call log. In the example, the contact details for the 11th most recent call are displayed. Press ENT to move to the next screen.
3. Press ENT again to confirm the call back.
4. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice. If the call is to a Coast Station (MMSI begins with 00) the radio will recognize this and specify the correct channel to talk on.
5. The call details are shown. Press ENT to send the call. The Tx symbol is displayed on the LCD while the call is being sent.

## 7-9 Send Using the Distress Log (DIST LOG)

```
DSC CALL
ALL SHIPS ▲
CALL LOG
►DISTR LOG
SENT CALL ▼
```

```
02 SEASPRAY
DISTRESS
FLOODING

ENT-->OPTION
```

```
02 SEASPRAY
►CALL BACK
DELETE
INFO
```

```
CHOOSE CH
►INTER-SHIP
MANUAL
```

```
02 SEASPRAY
INDIVIDUAL
ROUTINE
►SEND?
```

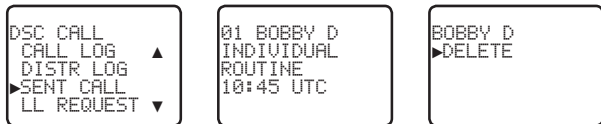
The Distress Log contains the Distress Log data for the 20 most recent received Distress Calls, so that you can call any of them quickly. Always try to make voice contact on CH16 first, as follows:

1. Select DSC CALL then DIST LOG.
2. The most recently received Distress Call is the first entry (01) in the Distress Log. Select the entry that you want to call and press ENT.
3. Select one of the following options:
  - **CALL BACK** To CALL the station.
  - **DELETE** To delete the details from the distress log.
  - **INFO** To view additional information about the station.
4. Select CALL BACK and press ENT.
5. Choose a working channel to talk on. Select the INTER-SHIP and press ENT. The radio automatically lists all Inter-ship (Simplex) channels that can be used. Duplex channels cannot usually be called, however, if you wish to use a Duplex channel, select MANUAL instead, then select your channel of choice. If the call is to a Coast Station (MMSI begins with 00) the radio will recognize this and specify the correct channel to talk on.
6. The call details are shown. Press ENT to send the call. The Tx symbol is displayed on the LCD while the call is being sent.

## 7-10 View Sent Call Log (SENT CALL)

---

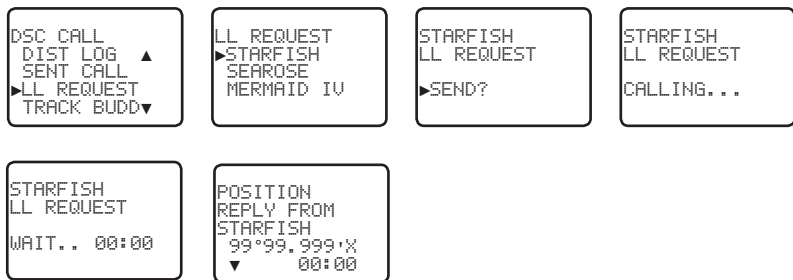
The Sent Call log contains the contact details for the 20 most recent sent calls, so that you review details of the call.



1. Select DSC CALL then SENT CALL. Scroll down to the desired sent call details.
2. The radio displays the details for the most recent sent call as the first entry (01) in the call log. In the example, the contact details for the most recent call are displayed.
3. Press ENT to advance to next screen. You now have the following options:
  - **DELETE** To delete the entry from the sent call log.

## 7-11 Request the LL Position of a Buddy (LL REQUEST)

---



1. Press CALL to enter DSC mode, then select LL REQUEST.
2. Select the buddy whose LL position you want to request then press ENT to send the request.
3. The radio waits for an acknowledgement from your buddy. If there is no reply after 30 seconds the radio asks if you want to retry. Press ENT to retry the call.
4. If the call is acknowledged, press **SILENC** soft key (AIS/IC key) to silence the alert, press +/- button or rotate the CH knob to scroll any further information about the call.

## 7-12 Track your Buddy (TRACK BUDDY)

You can select a buddy or buddy's to automatically track their positions. You must setup a tracklist first and set their track status to ON before buddy track can begin. You can also start and stop tracking your buddy and add or remove buddies from your buddy tracklist.

### 7-12-1 Start or Stop Tracking a Buddy (START TRACK)

Use START TRACK to track the position of a buddy(s) on your TRACKLIST whose status is ON (see the following section). The buddy's position is updated at the interval you select in INTERVAL (15, 30, or 60 minutes).

**Note:** START TRACK will only track buddy(s) on your TRACKLIST whose status is ON.

```
DSC CALL
SENT CALL ▲
LL REQUEST
▶TRACK BUDD
DSC TEST ▼
```

```
TRACK BUDDY
▶START TRACK
SET BUDDY
TRACKLIST
INTERVAL
```

```
START TRACK
SEAROSE OFF
MERMAID ON
SEASPRAY ON
```

```
START TRACK
>YES
NO
```

```
MERMAID IV
LL REQUEST

CALLING...
```

```
SEASPRAY
LL REQUEST

CALLING...
```

1. Select DSC CALL then TRACK BUDDY.
2. Select START TRACK. The status of each buddy on your tracklist (ON or OFF) is displayed.
3. Check that the status of the buddy (or buddies) that you want to track is ON, then press ENT.
4. Select YES then press ENT to start tracking (in this example, MERMAID IV and SEASPRAY.)  
An LL Request is sent to each buddy on CH70 and your radio waits for your buddy's LL position to be displayed on the LCD. See Section 7-19 for more information.  
(Select NO in the START TRACK page to STOP tracking your buddies.)

### 7-12-2 Select a Buddy to Track (SET BUDDY)

```
DSC CALL
SENT CALL ▲
LL REQUEST
▶TRACK BUDD
DSC TEST ▼
```

```
TRACK BUDDY
START TRACK
▶SET BUDDY
TRACKLIST
INTERVAL
```

```
SET BUDDY
SEAROSE OFF
▶MERMAID OFF
```

```
SET BUDDY
MERMAID IV
▶ON
OFF
```

1. Select DSC CALL then TRACK BUDDY.
2. Select SET BUDDY to show the status of each buddy on your tracklist (ON or OFF).
3. Select the buddy whose status you want to change, then select the new status and press ENT to confirm.

### 7-12-3 Add or Delete a Buddy on Your Track List (TRACKLIST)

```
DSC CALL  
SENT CALL ▲  
LL REQUEST  
▶TRACK BUDD  
DSC TEST ▼
```

```
TRACK BUDDY  
START TRACK  
SET BUDDY  
▶TRACKLIST  
INTERVAL
```

```
TRACKLIST  
▶ADD NEW  
SEAROSE
```

```
ADD NEW  
▶MERMAID IV  
SEASPRAY
```

1. Select DSC CALL then TRACK BUDDY.
2. Select TRACKLIST. Any buddies already on the tracklist will be listed.  
**Note:** To delete a buddy from the tracklist, select that buddy then press ENT. Select YES then press ENT again to delete.
3. Select ADD NEW to show your buddy list. Buddy's must be already setup in your Buddy list - see section 3-3.
4. Select a buddy then press ENT to add that buddy to the tracklist.

### 7-12-4 Set the Track your Buddy update interval (INTERVAL)

Set the interval rate at which the position of your buddy is updated - options are 15, 30 or 60 minutes.

```
DSC CALL  
SENT CALL ▲  
LL REQUEST  
▶TRACK BUDD  
DSC TEST ▼
```

```
TRACK BUDDY  
START TRACK  
SET BUDDY  
TRACKLIST  
▶INTERVAL
```

```
TRACKLIST  
▶15 MINUTES  
30 MINUTES  
1 HOUR
```

### 7-13 Make a DSC test call (DSC TEST)

---

You can test your radio's DSC operation by sending a DSC TEST CALL to a Buddy or other station equipped with a DSC radio.

**Note:** You should not use a routine DSC call to test your radio and you should minimize the use of the safety channel for test purposes.

#### 7-13-1 Send a DSC TEST call

1. Select DSC CALL then DSC TEST.
2. Select the buddy you want to call from your buddy list, or Select MANUAL NEW then enter the MMSI of the individual you want to call.
3. Press ENT to accept the selection.
4. Press ENT again to SEND the call. Channel 70 is selected automatically and the **TX** symbol is shown on the LCD while the call is being sent.
5. The radio waits for an acknowledgement (WAIT). If the call is acknowledged a notification is displayed.

```
DSC CALL
LL REQUEST▲
TRACK BUDDY
►DSC TEST
MMSI/GPS
```

```
DSC TEST
MANUAL NEW
SAM
►TOM
```

```
TOM
DSC TEST
►SEND?
```

```
TOM
DSC TEST
WAIT.. 00:17
```

6. If there is no reply after 30 seconds, the radio asks you if you want to retry.

### 7-13-2 Receiving an incoming DSC TEST call reply (DSC TEST ACK)

1. When you receive notification of a DSC TEST reply, press **SILENC** soft key (AIS/IC key) to silence the alert.
2. If the radio recognizes the user MMSI as one of your buddies, the buddy's name is displayed in place of the user MMSI.

### 7-13-3 Acknowledging an incoming DSC TEST call

The radio sounds a friendly two-tone alert when it detects an incoming DSC TEST call.

**Note:** If TEST REPLY is set to AUTO, no sound will be emitted.

1. If the radio recognizes the MMSI as one of your buddies, your buddy's name is displayed in place of the MMSI.
2. Press **SILENC** soft key (AIS/IC key) to silence the alert.
3. The radio will automatically acknowledge the call if TEST REPLY is set to AUTO (See section 5-9) and after a TIMEOUT period set for AUTO REPLY (See section 5-10).

```
TEST
CALL FROM
TOM
AUTO ACK
▼ 00:01
```

```
CALL FROM
TOM
AUTO ACK
IN 10S
▲▼ 00:02
```

4. Alternatively, if TEST REPLY is set to MANUAL, a manual response is required, press ACK (AIS/IC key) to acknowledge the DSC Test Call.

```
TEST
CALL FROM
TOM
AUTO ACK
▼ 00:01
```

```
CALL FROM
TOM
AUTO ACK
IS OFF
▲▼ 00:02
```

5. Press +/- button or rotate the CH knob to scroll any further information (if available), or press EXIT to cancel.

## 7-14 View User MMSI and GPS information

---

The radio's MMSI can be viewed as well as the current position.

```
DSC CALL
LL REQUEST▲
TRACK BUDDY
DSC TEST
▶MMSI/GPS
```

```
ID:123456789
99°99.999'X
999°99.000'Y
```

## 7-15 Receiving DSC Calls

---

Several types of DSC calls can be received from vessels within range at various priority levels:

- **DISTRESS** See Section 8.
- **ALL SHIPS** Urgency or Safety priority (see Section 7-16)
- **INDIVIDUAL** Urgency, Safety, or Routine priority (see Section 7-17)
- **GROUP** Routine priority only (see Section 7-18)
- **GEOGRAPHIC** Routine priority only see Section 7-19)
- **POLLED POSITION** Routine or Safety priority (see Section 7-20)

In addition to the audible alert, the telephone icon will flash on the screen.

This is to remind you that a call is stored in the CALL LOG. Polled position call data is NOT stored.

## 7-16 Receiving an All Ships Call (ALL SHIPS)

---

```
ALL SHIPS
SAFETY FROM
123456789
AUTO SWITCH
▼ 00:01
```

```
ALL SHIPS
SAFETY FROM
123456789
AUTO SW OFF
▼ 00:01
```

```
ALL SHIPS
SAFETY FROM
123456789
CHANGE TO
▼ 00:11
```

1. When you receive notification of an ALL SHIPS call, press **SILENC** soft key (AIS/IC key) to silence the alert. The priority level and the user MMSI are displayed on the screen. If the radio recognises the user MMSI as one of your buddies, the buddy name is shown in place of the user MMSI.
2. Press **ACCEPT** soft key (AIS/IC key) to switch to the designated channel immediately, Press +/- button or rotate the CH knob to scroll any further information about the call, or press EXIT to return the current DSC receive process.
3. If the display shows "AUTO SWITCH", the radio will automatically switch to the designated channel after 10s if no user intervention. For "AUTO SW OFF", a manual change is required - for "AUTO SWITCH" options, see section 5-18.

4. Press PTT to initiate voice contact on current display channel.

The call data is stored in your Call Log (see Section 7-8).

## 7-17 Receiving an Individual Call (INDIV)

---

```
INDIVIDUAL  
ROUTINE FROM  
123456789  
AUTO SWITCH  
▼ 00:01
```

```
INDIVIDUAL  
ROUTINE FROM  
123456789  
AUTO SW OFF  
▼ 00:01
```

1. When you receive notification of an INDIV call, press **SILENC** soft key (AIS/IC key) to silence the alert. INDIV calls are almost always routine priority. If the radio recognises the user MMSI as one of your buddies, the buddy's name is displayed in place of the user MMSI.
2. Press +/- button or rotate the CH knob to scroll any further information about the call, or press EXIT to return the current DSC receive process.
3. You have the following options to respond the call:
  - **ABLE** soft key (WX/NAV key) respond to the call with requested channel
  - **NEW-CH** soft key (AIS/IC key) respond to the call with but request a different channel
  - **UNABLE** soft key (GO/MOB key) respond to the call with unable to use the requested channel ( Note: this option is not available with ROUTINE calls)
4. If the display shows "AUTO SWITCH", the radio will automatically respond to the call after 10s if no user intervention. For "AUTO SW OFF", a manual response is required - for "INDIV REPLY" options , see section 5-15.
5. The caller should respond to your acknowledgement by making voice contact designated channel. If this does not happen, you can press PTT to initiate voice contact instead.

The call data is stored in your Call Log (see Section 7-8).

## 7-18 Receiving a Group Call (GROUP)

---

```
GP: SAM  
CALL FROM  
123456789  
AUTO SWITCH  
▼ 00:01
```

```
GP: SAM  
CALL FROM  
123456789  
AUTO SW OFF  
▼ 00:01
```

```
GP: SAM  
CALL FROM  
012345678  
CHANGE TO  
▼ 00:11
```

1. When you receive notification of a GROUP call, press **SILENC** soft key (AIS/IC key) to silence the alert. Press +/- button or rotate the CH knob to scroll any further information about the call.  
  
The priority level is always routine, and the group is identified on the screen. The group will be one of the 20 groups of frequently called people that you set up earlier (see Section 5-2).
2. Press **ACCEPT** soft key (AIS/IC key) to switch to the designated channel immediately, or



press EXIT to return the current DSC receive process.

3. If the display shows "AUTO SWITCH", the radio will automatically switch to the designated channel after 10s if no user intervention. For "AUTO SW OFF", a manual change is required - for "AUTO SWITCH" options, see section 5-18.
4. You do not need to send an acknowledgement. If desired, press PTT to initiate voice contact on the designated channel.

The call data is stored in your Call Log (see Section 7-8).

## 7-19 Receiving a Geographic Area Call (GEOGRAPH)

---

```
GEOGRAPHICAL  
CALL FROM  
254622211  
CH12 REQUEST  
▼ 00:01
```

```
GEOGRAPHICAL  
CALL FROM  
254622211  
CHANGE TO  
▼ 00:08
```

A geographic call is received by vessels within a specific geographic boundary area.

1. When you receive notification of a GEOGRAPHICAL call, press **SILENC** soft key (AIS/IC key) to silence the alert. Then press **ACCEPT** soft key (AIS/IC key) to manually select the channel designated in the incoming call.

The user MMSI or name is displayed on the screen. If the radio recognises the user MMSI as one of your buddies, the buddy's name is displayed in place of the user MMSI.

2. Press +/- button or rotate the CH knob to scroll any further information about the call, or press EXIT to return the current DSC receive process.
3. Monitor the working channel for an announcement from the calling vessel.

## 7-20 Receiving a Polled Position Call (POSITION)

---

```
POSITION  
REPLY FROM  
123456789  
82°50.1234 N  
▼ 00:01
```

When you receive GPS position data from a buddy in response to your LL request (see Section 7-12) you are recommended to make a written note of the position, especially if it is a good fishing position.

If enhanced LL position information is available from your buddy, press **SILENC** soft key (AIS/IC key) to silence the alert. Press +/- button or rotate the CH knob to scroll any further information about the call, or press EXIT to return the current DSC receive process.

**Note:** DSC & DSE sentence will be output on the NMEA0183 port for indication on a connected chart-plotter / MFD.

## Section 8 - DISTRESS Calls



A valid USER MMSI must be entered into this radio before these DSC functions can be used. See section 5-1.

### 8-1 Sending a Distress Call

```
DISTRESS CALL
▶UNDEFINED
FIRE
FLOODING
COLLISION
```

```
DISTRESS CALL
▶UNDEFINED
HOLD DISTRESS
3 SECONDS..
```

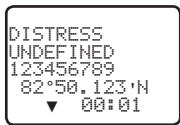
```
DISTRESS CALL
UNDEFINED
11:23 UTC
22°12.023'N
▼TX IN 00:01
```

1. Open the red cover labelled DISTRESS.  
If time is available to specify the nature of the distress, go to step 2. Otherwise, go directly to step 3.
2. Press and release the DISTRESS key to display the following categories. Press +/- button or rotate the CH knob to select the category that describes your situation then press ENT.
  - **UNDEFINED** (Undefined)
  - **FIRE** (Fire)
  - **FLOODING** (Flooding)
  - **COLLISION** (Collision)
  - **GROUNDING** (Grounding)
  - **LISTING** (Listing)
  - **SINKING** (Sinking)
  - **ADRIFT** (Adrift)
  - **ABANDONING** (Abandoning)
  - **PIRACY** (Piracy)
  - **OVER BOARD** (Overboard)
3. Press and hold down the DISTRESS key for about 3 seconds, until you see the distress call sending message (DISTRESS CALL SENDING) on the screen. The whole display starts to flash and beep loudly.
4. After the Distress Call is sent, the radio waits for an acknowledgment.
  - The Distress call is automatically transmitted every 3.5 to 4.5 minutes, until an acknowledgement is received ("Call repeat" mode).
  - Press ▼ / ▲ to display the transmitted Distress call information.

- You now have the following options: RESEND, PAUSE, CANCEL:
- To RESEND the call, press **RESEND** soft key (AIS/IC key) to enter "HOLD DISTRESS 3 SECONDS TO SEND" screen. Hold down DISTRESS key for 3s to resend the call or press **EXIT** soft key (AIS/IC key) to return to waiting for an acknowledgement call.
- To PAUSE the call, press **PAUSE** soft key (WX/NAV key) to pause the "Call repeat" mode, press **EXIT** soft key (AIS/IC key) to resume the same call.
- To CANCEL the call, press **CANCEL** soft key (GO/MOB key) to enter "DISTRESS CALL SEND CANCEL" screen.
  - Press **NO** soft key (WX/NAV key) to return to waiting for an acknowledgement call.
  - Press **YES** soft key (AIS/IC key) to send the DISTRESS CANCEL call. Then press PTT to report your situation using the handset mic, after the report, press EXIT to return to the normal operating mode.
- After receiving the acknowledgment, press **SILENC** soft key (AIS/IC key) then reply using the microphone, or press EXIT key to quit the current distress acknowledgment.

**Note:** Prior to receiving an acknowledgement, the distress alert call cannot immediately be terminated by you, it can only be cancelled by completing the distress call cancel process as described above (step 8).

## 8-2 Receiving a Distress Call (DISTRESS!)



An alert sounds when a distress call (DISTRESS!) is received.

- Press **SILENC** soft key (AIS/IC key) to silence the alert. You do not need to send an acknowledgement.
- The radio automatically selects CH16 after 10 seconds if no user intervention, or press **ACCEPT** soft-key (AIS/IC key) to change to CH16 immediately.
- Press +/- button or rotate the CH knob to view details of the distress call. Details include the user MMSI and nature of the emergency (if specified), also the time and the location (if specified). If the location and time are not specified, these are replaced with sequences of 9s and 8s respectively.
  - The radio is capable of receiving enhanced LL position data if the vessel transmitting the distress call is sending this. This provides the position of the distressed vessel to within 20 m (60 ft).
- Press PTT to establish voice contact or press EXIT key to quit the DISTRESS RECEIVE call.

**Note:** The call data is stored in the Distress Log and location data (DSC & DSE) sentence will be output on the NMEA0183 port for indication on a connected chart-plotter / MFD.

## 8-3 Distress Acknowledgement (DISTRESS ACK) or Distress Relay All Ships (DISTRESS REL)

---

1. An alert sounds when a Distress ACK or Distress Relay all ship call is received. Press **SILENC** soft-key (AIS/IC key) to silence the alert.
2. The radio automatically selects CH16 after 10 seconds if no user intervention, or press **ACCEPT** soft-key(AIS/IC key) to change to CH16 immediately.
3. Press +/- button or rotate the CH knob to view details of the distress call. Details include the user MMSI and nature of the emergency (if specified), also the time and the location (if specified). If the location and time are not specified, these are replaced with sequences of 9s and 8s respectively.
4. Press PTT to make voice contact with the calling vessel. Maintain a listening watch on CH16 and standby to lend assistance
  - For a Distress Acknowledgement (DISTRESS ACK) sent from the Search and Rescue (SAR) authorities of your country, your radio automatically cancels Distress Mode transmissions and CH16 appears. Press PTT to establish voice contact with the Search and Rescue (SAR) authority.
  - The Search and Rescue (SAR) authorities of your country are the only instance allowed to send a Distress Acknowledgement (DISTRESS ACK).
5. Press EXIT key to quit the current DSC receive process.

**Note:** The call data is stored in the Distress Log and location data (DSC & DSE) sentence is sent on the NMEA0183 port for indication on a connected chart-plotter / MFD.

```
DISTRESS
ACK FROM
567890123
FIRE
▼ 00:01
```

```
87654321
ALL DISTR
RELAY
123456789
▼ 00:01
```

## 8-4 Distress Relay Individual (INDIV DISTR RELAY)

---

When an incoming Individual Distress Relay call is received, the alarm sounds and INDIV DISTR RELAY is displayed.

1. Press **SILENC** soft-key (AIS/IC key) to silence the alarm.
2. Press +/- button or rotate the CH knob to view details of the distress call. Details include the user MMSI and nature of the emergency (if specified), also the time and the location (if specified). If the location and time are not specified, these are replaced with sequences of 9s and 8s respectively.
3. ALL MODELS: Press **ACCEPT** soft-key (AIS/IC key) to immediately accept the channel change before the 10s timer expires
4. US MODELS: Press **ACK** soft-key (AIS/IC key) to ACK the call after the 10s delay - for "INDIV REPLY" options, see section 5-15.
5. Press EXIT key to quit current receive DSC process..

**Note:** The call data is stored in the Distress Log and location data (DSC & DSE) sentence is sent on the NMEA0183 port for indication on a connected chart-plotter / MFD.

## Section 9 - AIS Functionality



A valid USER MMSI must be entered into this radio before these AIS functions can be used. See section 5-1.

### 9-1 About AIS

---

The marine Automatic Identification System (AIS) is a location and vessel information reporting system. It allows vessels equipped with AIS to automatically and dynamically share and regularly update their position, speed, course and other information such as vessel identity with similarly equipped vessels. Position is derived from the Global Positioning System (GPS) and communication between vessels is by Very High Frequency (VHF) digital transmissions.

There are a number of types of AIS device as follows:

- Class A transceivers. These are similar to class B transceivers, but they are designed to be fitted on large vessels such as cargo ships and large passenger vessels. Class A transceivers transmit at a higher VHF signal power than class B transceivers and therefore can be received by more distant vessels, and also transmit more frequently. Class A transceivers are mandatory on all vessels over 300 gross tonnes on international voyages and certain types of passenger vessels under the SOLAS regulations.
- Class B transceivers. Similar to class A transceivers in many ways, but are normally lower cost due to the less stringent performance requirements. Class B transceivers transmit at a lower power and at a lower reporting rate than class A transceivers.
- AIS base stations. AIS base stations are used by Vessel Traffic Systems to monitor and control the transmissions of AIS transceivers.
- Aids to Navigation (AtoN) transceivers. AtoNs are transceivers mounted on buoys or other hazards to shipping which transmit details of their location to the surrounding vessels.
- AIS receivers. AIS receivers will generally receive transmissions from class A transceivers, class B transceivers, AtoNs and AIS base stations but do not transmit any information about the vessel on which they are installed.

This radio contains an AIS receiver only function.

### 9-2 AIS - Static and Dynamic information

---

Defined transmit rates for Class A vessels shown below are provided for reference purposes only. The frequency of messages received will vary due to a number of factors including but not limited to such factors as antenna height, gain and signal interference.

- Static information is either broadcast every 6 minutes, when data has been amended, or upon request.

- Dynamic information is broadcast depending on speed and course alteration based on the following tables:

| <b>Ships Dynamic Conditions</b>               | <b>Normal reporting interval</b> |
|-----------------------------------------------|----------------------------------|
| At anchor or moored                           | 3 Minutes                        |
| 0-14 knots                                    | 10 Seconds                       |
| 0-14 knots and changing course                | 3 1/3 Seconds                    |
| 14-23 knots                                   | 6 Seconds                        |
| 14-23 knots and changing course               | 2 Seconds                        |
| Ship faster than 23 knots                     | 2 Seconds                        |
| Ship faster than 23 knots and changing course | 2 Seconds                        |

| <b>Platforms condition</b>                                        | <b>Normal reporting interval</b> |
|-------------------------------------------------------------------|----------------------------------|
| Class B Shipborne mobile equipment not moving faster than 2 Knots | 3 Minutes                        |
| Class B Shipborne mobile equipment moving 2-14 Knots              | 30 Seconds                       |
| Class B Shipborne mobile equipment moving 14-23 Knots             | 15 Seconds                       |
| Class B Shipborne mobile equipment moving faster than 23 Knots    | 5 Seconds                        |
| Search and Rescue aircraft (airborne mobile equipment)            | 10 Seconds                       |
| Aids to Navigation                                                | 3 Minutes                        |
| AIS base station                                                  | 10 Seconds                       |

Source of information for above tables 1-1, 1-2: (ITU recommendations technical document: ITU-R M.1371-1)

### ***9-3 Using the AIS receiver***

---

Providing that other vessels with AIS transceivers installed are within radio range of your vessel, you should see their details appear on the AIS plotter screen. These details are also repeated on the NMEA ports for display on a compatible chartplotter / MFD.

Specific details of how to configure your chartplotter to make use of the AIS receiver features will be given in your chartplotter manual. If you are using charting software running on a PC, please refer to the instructions provided with your chartplotting software for details of how to configure it to display AIS information.

## 9-4 AIS Information and display

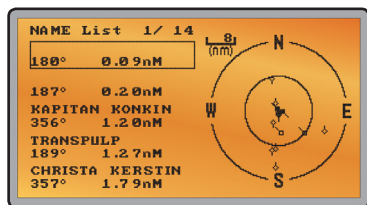
### CAUTION

Not all vessels transmit AIS information and therefore not all vessels will be displayed or listed in the following AIS screens.

AIS vessel information can be displayed on the radios LCD screen:

1. Press the AIS/IC button to display the AIS plotter screen

**Note:** You must have LAT/LON position information for targets to be displayed on the plotter PPI.



2. AIS target details will be displayed on the left of the screen. Either the vessels name or MMSI will be displayed (if the information is available) depending on the setting you selected in Section 6-2. Also the targets bearing and distance to you are displayed.  
**Note:** it could take some time before AIS targets are displayed.
3. A simple plotter PPI on the right hand side of the LCD shows the geographical location of the AIS targets with respect to your position which is in the center of the plotter PPI.
4. Press the Zoom In (3CH +/-) or Zoom Out (Scan) keys to change the scale of the plotter. The scale available is 1nm / 2nm / 4nm / 8nm / 16nm / 32nm.
5. Press the AIS/IC key again to change the display to T/CPA Approach screen.
6. Rotate the knob to highlight any AIS target shown on the plotter screen. The selected target will have the target symbol filled in.

```
NAME: OCEANIC DISCOVERER
MMSI: 503492000   IMO: 9292747
CALL SIGN: UMQ8808
DIST: 1.62nm     BEAR: 285°
TCPA: -----   HEADING: 195.0°
CPA: 1.62nm     ROT: 0.0 /min
WIDTH: 0.0m     SOG: 9.9KTS
LENGTH: 60.0m   COG: 219.0°
RECEIVED: 1M19S  LAT: 36°45.785'S
DRAUGHT: -----  LON: 174°49.157'E
TYPE: PASSENGER SHIP - ALL SHIPS
      OF THIS TYPE
STATUS: UNDERWAY USING ENGINE
```

7. Press ENT to view full details of the highlighted target such as MMSI, Vessel name, distance, bearing, heading, ROT, COG, SOG, status and other vessel information.


### 9-4-1 T/CPA Approach screen


1. When in AIS mode, press the AIS/IC key again to toggle between the standard AIS screen and the T/CPA Approach screen.
2. In TCPA Approach mode, the approaching AIS target's details are listed on the left side along with its geographical position on the plotter PPI.
3. The zoom range is automatically selected to the best range according to the selected target on the left. You can't change the zoom range in this mode.
4. Press +/- button or rotate the CH knob to select the target, press ENT key to display target information, or press EXIT key to return to the previous display.


**Note:** If the radio detects a TCPA or CPA breach, the T/CPA Approach screen will automatically pop up with an alert tone. Press EXIT to stop the alert. The alert will sound again after 1 minute if the AIS alarm has not been released.



### 9-4-2 Plotter symbols and meanings

 Your vessel is always in the center of the plotter screen. You are represented by a solid circle, along with a small line that indicates your bearing with respect to North.

 All other vessels or targets displayed on the plotter screen are represented by a diamond shape. These are targets around your vessel that are within the current zoom distance setting. The small line indicates the targets bearing.

 When a target is selected, it is represented by a solid diamond.

#### Examples:

 You and the target vessel are heading **away** from each other.

 You and the target vessel are heading **towards** each other.

**Note:** Nautical Miles is the only unit used in AIS mode.

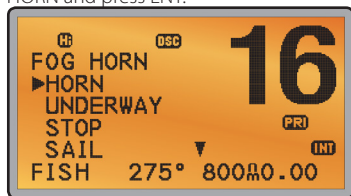


## Section 10 - General Functionality

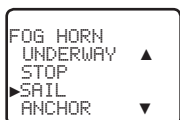
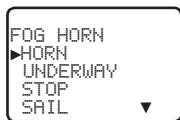
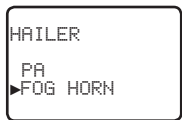
### 10-2 Using the Fog Horn

An appropriate PA speaker must be connected to the Hailer wiring before the FOG HORN function can be used. The FOG HORN will sound certain international standard fog horn tones through the hailer speaker depending on the mode selected.

1. Press and hold the AIS/IC button for about 1 second to enter HAILER mode. Select FOG HORN and press ENT.



2. There are 8 choices of internationally recognized fog horn sounds and timing:
  - **HORN** (Horn) Manual operation
  - **UNDERWAY** (Underway) One long tone
  - **STOP** (Stop) Two long tone
  - **SAIL** (Sail) One long, two short
  - **ANCHOR** (Anchor) One long warble
  - **TOW** (Tow) One long, three short
  - **AGROUND** (Aground) Warble sequence
  - **SIREN** (Siren) Manual operation
3. Scroll through the menu to select a fog horn type, then press ENT to start the selected fog horn sounding. All except HORN and SIREN will sound automatically.
4. The fog horn will sound automatically approximately every two minutes until you press EXIT to cancel it. When the fog horn is not sounding, it is in LISTEN mode.
5. To change the volume, turn the Channel Select knob, or press + or – when the fog horn is sounding.
6. To operate HORN or SIREN, once selected, press and hold ENT button. This will sound as long as the ENT button is pressed. You can then also operate PTT to talk through the Hailer.



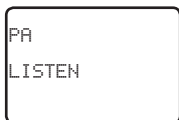
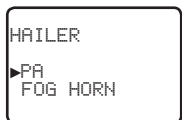
**Note:** you cannot change the volume of the HORN or SIREN.

## 10-1 Using the PA (Public Address) Hailer

---

An appropriate Hailer speaker must be connected to the Hailer wiring before the PA function can be used. The PA allows you to make an announcement at high volume to people or vessels using the Link-8 hand mic. The PA function also features a listen-back mode where the speaker is used as a microphone to listen for a response.

1. Press and hold the AIS/IC button for about 1 second to enter HAILER mode. Select PA and press ENT.
2. Press PTT to talk through the hailer. Turn the Channel Select knob, or press + or - to change the volume. Volume can only be changed while the PTT is pressed.
3. Release PTT to LISTEN for a response.



4. Press EXIT to return to operational mode.

# Appendix A - Technical Specifications

## LOWRANCE Link-8

| <b>GENERAL</b>                          | <b>Unit</b> | <b>LIMIT</b>                                            |
|-----------------------------------------|-------------|---------------------------------------------------------|
| Standard Operation Temperature          | °C          | -20°C to +55°C (-4°F to 131°F)                          |
| Normal Working Voltage                  | V           | 12 V DC battery system (negative ground)                |
| Low battery detect Voltage              | V           | 10.5V                                                   |
| Rx Current Drain at : Max Audio Power   | A           | ≤1.5                                                    |
| : Stand-By                              | A           | ≤0.25                                                   |
| : Hailer Power                          | A           | ≤3.5                                                    |
| Tx Current Drain at : Hi Power          | A           | ≤6 (@13.6V DC)                                          |
| : Lo Power                              | A           | ≤1.5 (@13.6V DC)                                        |
| Dimensions                              | mm          | 180.5 x 96.3 x 171                                      |
| Weight                                  | kg          | 1.63                                                    |
| VHF Frequency Range: Transmit           | MHz         | 156.025 To 157.425 (default)                            |
| VHF Frequency Range: Receive            | MHz         | 156.025 To 163.275 (default)                            |
| Oscillate Mode                          |             | PLL                                                     |
| Modulation                              |             | FM (16KOG3E) DSC (16K0G2B)                              |
| Usable channels                         |             | International, USA, Canada, Weather (country specific)  |
| Channel Spacing                         | KHz         | 25                                                      |
| Frequency Stability                     | PPM         | ±5                                                      |
| Audio power of speaker in mike          | dBA         | 80dBA @ 1m                                              |
| Audio power of speaker in base          | dBA         | 94dBA @ 1m (Ø=57mm)                                     |
| Digital Selectivity Calling (DSC) CH70) |             | Class-D (EN301025) with dual receiver (individual)      |
| Standards – DSC                         |             | ITU-R M.493-13 (US models),<br>EN 300-338-3 (EU models) |
| Standards – AIS                         |             | ITU-R M.1371-4                                          |
| Standards - Other                       |             | EN 60950-1:2006 /A1:2010                                |
| LCD display                             |             | 128 x 256 pixel LCD FSTN – 1.3" x 2.6"                  |
| Contrast control                        |             | Yes                                                     |
| Dimming control                         |             | Yes                                                     |
| Antenna connector                       |             | SO-239 (50 ohm)                                         |
| NMEA2000 connector                      |             | Micro-C (5 pin)                                         |
| Waterproof                              |             | JIS-7                                                   |
| Compass safe distance:                  |             | 0.5 m (1.5')                                            |
| <b>RECEIVER:</b>                        | <b>Unit</b> | <b>LIMIT</b>                                            |
| Intermediate Frequency : 1st            | MHz         | 21.4                                                    |
| : 2nd                                   | KHz         | 450                                                     |

|                                   |              |      |                                             |
|-----------------------------------|--------------|------|---------------------------------------------|
| Sensitivity                       | : 12dB SINAD | dBuV | ≤6                                          |
| Squelch Sensitivity : at tight    |              | dBuV | ≤6                                          |
| Spurious Response Rejection Ratio |              | dB   | ≥70                                         |
| Adjacent Channel Selectivity      |              | dB   | ≥70                                         |
| Intermodulation Response          |              | dB   | ≥68                                         |
| S/N at 3KHz Dev.                  |              | dB   | ≥40                                         |
| Audio Output Power At THD 10%     |              | W    | 5W (external speaker output)                |
| Audio Distortion                  |              | %    | ≤5                                          |
| Audio Response                    |              | dB   | +1 to -3dB of 6dB/octave from 300Hz to 3kHz |

|                     |             |              |
|---------------------|-------------|--------------|
| <b>TRANSMITTER:</b> | <b>Unit</b> | <b>LIMIT</b> |
|---------------------|-------------|--------------|

|                                     |      |     |                                             |
|-------------------------------------|------|-----|---------------------------------------------|
| Frequency error                     |      | PPM | ±5                                          |
| RF Power                            | : Hi | W   | 23 ± 2                                      |
|                                     | : Lo | W   | 0.8 ± 0.2                                   |
| Maximum Deviation                   |      | KHz | ± 5                                         |
| S/N at 3KHz Dev.                    |      | dB  | 40                                          |
| Modulation Distortion ±3KHz         |      | %   | ≤5                                          |
| Audio Response at 1KHz Dev.         |      | dB  | +1 to -3dB of 6dB/octave from 300Hz to 3kHz |
| Spurious/Harmonic Emissions : Hi/LO |      | uW  | <0.25                                       |
| Modulation Sensitivity              |      | mV  | ≤20                                         |
| Transmitter Protection              |      |     | Open/short circuit of antenna               |

|                        |             |              |
|------------------------|-------------|--------------|
| <b>COMMUNICATIONS:</b> | <b>Unit</b> | <b>LIMIT</b> |
|------------------------|-------------|--------------|

|                              |  |  |                                                              |
|------------------------------|--|--|--------------------------------------------------------------|
| Comm. port - NMEA 0183       |  |  | NMEA 0183, 4800 baud                                         |
| Comm. port - NMEA 2000       |  |  | NMEA 2000                                                    |
| NMEA 0183 input (receive):   |  |  | RMC, GGA, GLL, GNS                                           |
| NMEA 0183 output (transmit): |  |  | DSC (for DSC call), DSE (for enhanced position), AIVDM (AIS) |

|                |             |              |
|----------------|-------------|--------------|
| <b>HAILER:</b> | <b>Unit</b> | <b>LIMIT</b> |
|----------------|-------------|--------------|

|                 |  |   |              |
|-----------------|--|---|--------------|
| Audio Power Out |  | W | 30W @ 4 Ohms |
|-----------------|--|---|--------------|

|             |             |              |
|-------------|-------------|--------------|
| <b>AIS:</b> | <b>Unit</b> | <b>LIMIT</b> |
|-------------|-------------|--------------|

|                    |  |     |                                                                      |
|--------------------|--|-----|----------------------------------------------------------------------|
| AIS function       |  |     | Yes, dual receivers only                                             |
| Receiver Frequency |  | MHz | 161.975, 162.025<br>CH87 - 161.975; CH88 - 162.025 (default channel) |

Supported AIS Information:

|                         |  |  |                               |
|-------------------------|--|--|-------------------------------|
| -Vessel Name            |  |  | -Type of vessel               |
| -Call sign              |  |  | -MMSI number                  |
| -IMO number             |  |  | -Draft/Size of vessel         |
| -Vessel position        |  |  | -SOG/COG/Rate of turn/Heading |
| -Status/Destination/ETA |  |  |                               |

**Specifications are subject to change without notice.**

## **Link-8 NMEA2000 PGNS**

- 127250 Vessel Heading
- 127258 Magnetic Variation
- 129025 Position, Rapid Update
- 129026 COG & SOG, Rapid Update
- 129029 GNSS Position Data
- 129033 Time & Date
- 129038 Class A position report (Rx,Tx)
- 129039 Class B position report (Rx,Tx)
- 129040 Class B extended position report (Rx, Tx)
- 129041 AIS Aids to Navigation (AtoN) Report
- 129283 Cross Track Error
- 129284 Navigation Data
- 129285 Navigation Route/WP Information
- 129792 DGNSS Broadcast binary message (Tx)
- 129793 UTC and date report (Tx)
- 129794 Class A static and voyage related data (rx, tx)
- 129795 Addressed binary message (tx)
- 129796 Acknowledge (tx)
- 129797 Binary broadcast message (tx)
- 129798 SAR Aircraft Position report (tx)
- 129799 Radio Frequency/Mode/Power
- 129800 UTC/Date enquiry (tx)
- 129801 Addressed safety msg (rx,tx)
- 129802 Broadcast safety msg (rx,tx)
- 129803 Interrogation (tx)
- 129804 Assignment Mode Command (tx)
- 129805 Data Link Management message (tx)
- 129807 AIS Group Assignment
- 129808 DSC Call Information
- 129809 AIS Class B "CS" Static Data Report, Part A
- 129810 AIS Class B "CS" Static Data Report, Part B
- 130074 Route and WP Service - WP List - WP Name & Position
- 130842 AIS and VHF Messages (Simrad Proprietary for AIS Class B 'CS')

## Appendix B - Troubleshooting

### 1. The transceiver will not power up.

A fuse may have blown **or** there is no voltage getting to the transceiver.

- Check the power cable for cuts, breaks, or squashed sections.
- After checking the wiring, replace the 7 Amp fuse.
- Check the battery voltage. This must be greater than 10.5V.

### 2. The transceiver blows the fuse when the power is switched on.

The power wires may have been reversed.

- Check that the red wire is connected to the positive battery terminal, and the black wire is connected to the negative battery terminal.

### 3. The speaker makes popping or whining noises when the engine is running.

Electrical noise may be interfering with the transceiver.

- Re-route the power cables away from the engine.
- Add a noise suppressor to the power cable.
- Use resistive spark plug wires and/or use an alternator whine filter.

### 4. No sound from the external speaker.

- Check that the external speaker cable is physically connected.
- Check the soldering of the external speaker cable.

### 5. Transmissions are always on low power, even when high (Hi) power is selected.

The antenna may be faulty.

- Test the transceiver with a different antenna.
- Have the antenna checked out.

### 6. Battery symbol is displayed.

The power supply is too low.

- Check the battery voltage. This should be at least  $10.5\text{ V} \pm 0.5\text{ V DC}$ .
- Check the alternator on the vessel.

### 7. GPS alarm sounds and LCD shows: Please check GPS link! The NO GPS symbol is shown.

GPS data has been lost. This sequence will repeat every 4 hours until GPS data from an operational GPS receiver is available. The GPS cable may be faulty or the GPS setting may be incorrect:

- Manually enter your position and UTC time data (see Section 3.6.1)
- Check that the GPS cable is physically connected.
- Check the polarity of the GPS cable.
- Check the baud rate setting of the GPS if applicable. The baud rate setting should be 4800. Parity should be set to NONE.

## Appendix C - US & ROW VHF Marine Channel Charts

The following channel charts are provided for reference only and may not be correct for all regions. It is the operators responsibility to ensure correct channels and frequencies are used for local regulations.

### C-1 International Channel Chart

| CH | TX (MHz) | RX (MHz) | MODE | TRAFFIC TYPE                                    | SHIP TO SHIP | SHIP TO SHORE | NAME TAG     | REMARK    |
|----|----------|----------|------|-------------------------------------------------|--------------|---------------|--------------|-----------|
| 01 | 156.050  | 160.650  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 02 | 156.100  | 160.700  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 03 | 156.150  | 160.750  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 04 | 156.200  | 160.800  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 05 | 156.250  | 160.850  | D    | Port Operations                                 | No           | Yes           | PORT OPS/VTS |           |
| 06 | 156.300  | 156.300  | S    | Inter-ship Safety                               | Yes          | No            | SAFETY       |           |
| 07 | 156.350  | 160.950  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 08 | 156.400  | 156.400  | S    | Commercial (inter-ship only)                    | Yes          | No            | COMMERCIAL   |           |
| 09 | 156.450  | 156.450  | S    | Inter-ship                                      | Yes          | Yes           | CALLING      |           |
| 10 | 156.500  | 156.500  | S    | Commercial                                      | Yes          | Yes           | COMMERCIAL   |           |
| 11 | 156.550  | 156.550  | S    | Port Operations                                 | Yes          | Yes           | VTS          |           |
| 12 | 156.600  | 156.600  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS/VTS |           |
| 13 | 156.650  | 156.650  | S    | Inter-ship Navigation Safety (bridge-to bridge) | Yes          | No            | BRIDGE COM   |           |
| 14 | 156.700  | 156.700  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS/VTS |           |
| 15 | 156.750  | 156.750  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS     | ⊙ 1W only |
| 16 | 156.800  | 156.800  | S    | International Distress, Safety, and Calling     | Yes          | Yes           | DISTRESS     |           |
| 17 | 156.850  | 156.850  | S    | State Controlled                                | Yes          | Yes           | SAR          | ⊙ 1W only |
| 18 | 156.900  | 161.500  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 19 | 156.950  | 161.550  | D    | Ship to Shore                                   | No           | Yes           | SHIP-SHORE   |           |
| 20 | 157.000  | 161.600  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 21 | 157.050  | 161.650  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 22 | 157.100  | 161.700  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |
| 23 | 157.150  | 161.750  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 24 | 157.200  | 161.800  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 25 | 157.250  | 161.850  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 26 | 157.300  | 161.900  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 27 | 157.350  | 161.950  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 28 | 157.400  | 162.000  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 60 | 156.025  | 160.625  | D    | Public Correspondence                           | No           | Yes           | TELEPHONE    |           |
| 61 | 156.075  | 160.675  | D    | Port Operations                                 | No           | Yes           | PORT OPS     |           |

|    |         |         |   |                                 |       |       |            |   |
|----|---------|---------|---|---------------------------------|-------|-------|------------|---|
| 62 | 156.125 | 160.725 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 63 | 156.175 | 160.775 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 64 | 156.225 | 160.825 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 65 | 156.275 | 160.875 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 66 | 156.325 | 160.925 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 67 | 156.375 | 156.375 | S | Commercial, bridge-to-bridge    | Yes   | No    | BRIDGE COM |   |
| 68 | 156.425 | 156.425 | S | Inter-ship                      | Yes   | No    | SHIP-SHIP  |   |
| 69 | 156.475 | 156.475 | S | Port Operations                 | Yes   | Yes   | PORT OPS   |   |
| 70 | 156.525 | 156.525 | - | Digital Selective Calling - DSC | ----- | ----- | DSC        | Ⓢ |
| 71 | 156.575 | 156.575 | S | Port Operations                 | Yes   | Yes   | PORT OPS   |   |
| 72 | 156.625 | 156.625 | S | Inter-ship                      | Yes   | No    | SHIP-SHIP  |   |
| 73 | 156.675 | 156.675 | S | Port Operations                 | Yes   | Yes   | PORT OPS   |   |
| 74 | 156.725 | 156.725 | S | Port Operations                 | Yes   | Yes   | PORT OPS   |   |
| 77 | 156.875 | 156.875 | S | Ship to Shore                   | Yes   | No    | SHIP-SHORE |   |
| 78 | 156.925 | 161.525 | D | Ship to Shore                   | No    | Yes   | SHIP-SHORE |   |
| 79 | 156.975 | 161.575 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 80 | 157.025 | 161.625 | D | Port Operations                 | No    | Yes   | PORT OPS   |   |
| 81 | 157.075 | 161.675 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 82 | 157.125 | 161.725 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 83 | 157.175 | 161.775 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 84 | 157.225 | 161.825 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 85 | 157.275 | 161.875 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 86 | 157.325 | 161.925 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 87 | 157.375 | 161.975 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |
| 88 | 157.425 | 162.025 | D | Public Correspondence           | No    | Yes   | TELEPHONE  |   |

### **Special Notes on International Channel Usage**

- ① LOW POWER (1W) only.
- ② Channel 70 is designated for use exclusively for Digital Selective Calling (DSC), such as Distress, Safety, and Ship Calls. No voice communication is allowed on CH70. This channel is only available on DSC enabled radios.

#### **Note:**

- The INTERNATIONAL channel bank is not legal for use in U.S. or Canada waters.
- Select the INTERNATIONAL channel bank for use in Australia, New Zealand and other Asia Pacific regions, and all other regions where otherwise not specified.

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



## C-2 USA Channel Chart

| CH        | TX (MHz)       | RX (MHz)       | MODE     | TRAFFIC TYPE                                                      | SHIP TO SHIP | SHIP TO SHORE | NAME TAG      | REMARK    |
|-----------|----------------|----------------|----------|-------------------------------------------------------------------|--------------|---------------|---------------|-----------|
| 01A       | 156.050        | 156.050        | S        | Port Operations, Selected VTS Areas                               | Yes          | Yes           | PORT OPS/VTS  |           |
| 03A       | 156.150        | 156.150        | S        | US Government, Coast Guard                                        | Yes          | Yes           | UNAUTHORIZED  | ④         |
| 05A       | 156.250        | 156.250        | S        | Port Operations, Selected VTS Areas                               | Yes          | Yes           | PORT OPS/VTS  |           |
| 06        | 156.300        | 156.300        | S        | Inter-ship Safety                                                 | Yes          | No            | SAFETY        |           |
| 07A       | 156.350        | 156.350        | S        | Commercial                                                        | Yes          | Yes           | COMMERCIAL    |           |
| 08        | 156.400        | 156.400        | S        | Commercial (inter-ship only)                                      | Yes          | No            | COMMERCIAL    |           |
| 09        | 156.450        | 156.450        | S        | Recreational Calling Channel                                      | Yes          | Yes           | CALLING       |           |
| 10        | 156.500        | 156.500        | S        | Commercial                                                        | Yes          | Yes           | COMMERCIAL    |           |
| 11        | 156.550        | 156.550        | S        | Commercial, VTS in Selected Areas                                 | Yes          | Yes           | VTS           |           |
| 12        | 156.600        | 156.600        | S        | Port Operations, Selected VTS Areas                               | Yes          | Yes           | PORT OPS/VTS  |           |
| 13        | 156.650        | 156.650        | S        | Inter-ship Navigation Safety (bridge-to-bridge), 1W with Power-up | Yes          | No            | BRIDGE COM    | ③ 1W      |
| 14        | 156.700        | 156.700        | S        | Port Operations, Selected VTS Areas                               | Yes          | Yes           | PORT OPS/VTS  |           |
| 15        | ---            | 156.750        | S        | Environmental                                                     | -----        | -----         | ENVIRONMENTAL | ② RX only |
| 16        | 156.800        | 156.800        | S        | International Distress, Safety, and Calling                       | Yes          | Yes           | DISTRESS      |           |
| 17        | 156.850        | 156.850        | S        | State Controlled                                                  | Yes          | Yes           | SAR           | ① 1W only |
| 18A       | 156.900        | 156.900        | S        | Commercial                                                        | Yes          | Yes           | COMMERCIAL    |           |
| 19A       | 156.950        | 156.950        | S        | Commercial                                                        | Yes          | Yes           | COMMERCIAL    |           |
| <b>20</b> | <b>157.000</b> | <b>161.600</b> | <b>D</b> | Port Operations, Canadian Coast Guard                             | No           | Yes           | PORT OPS      |           |
| 20A       | 157.000        | 157.000        | S        | Port Operations                                                   | Yes          | Yes           | PORT OPS      |           |
| 21A       | 157.050        | 157.050        | S        | U.S. Government, Canadian Coast Guard                             | Yes          | Yes           | UNAUTHORIZED  | ④         |
| 22A       | 157.100        | 157.100        | S        | Coast Guard Liaison                                               | Yes          | Yes           | COAST GUARD   |           |
| 23A       | 157.150        | 157.150        | S        | U.S. Government, Coast Guard                                      | Yes          | Yes           | UNAUTHORIZED  | ④         |
| <b>24</b> | <b>157.200</b> | <b>161.800</b> | <b>D</b> | Public Correspondence, Marine operator                            | No           | Yes           | TELEPHONE     |           |
| <b>25</b> | <b>157.250</b> | <b>161.850</b> | <b>D</b> | Public Correspondence, Marine operator                            | No           | Yes           | TELEPHONE     |           |
| <b>26</b> | <b>157.300</b> | <b>161.900</b> | <b>D</b> | Public Correspondence, Marine operator                            | No           | Yes           | TELEPHONE     |           |
| <b>27</b> | <b>157.350</b> | <b>161.950</b> | <b>D</b> | Public Correspondence, Marine operator                            | No           | Yes           | TELEPHONE     |           |
| <b>28</b> | <b>157.400</b> | <b>162.000</b> | <b>D</b> | Public Correspondence, Marine operator                            | No           | Yes           | TELEPHONE     |           |
| 61A       | 156.075        | 156.075        | S        | U.S. Government, Canadian Coast Guard                             | Yes          | Yes           | UNAUTHORIZED  | ④         |
| 63A       | 156.175        | 156.175        | S        | Port Operations, VTS in Selected Areas                            | Yes          | Yes           | PORT OPS/VTS  |           |
| 64A       | 156.225        | 156.225        | S        | U.S. Government, Canadian Commercial Fishing                      | Yes          | Yes           | UNAUTHORIZED  | ④         |
| 65A       | 156.275        | 156.275        | S        | Port Operations                                                   | Yes          | Yes           | PORT OPS      |           |
| 66A       | 156.325        | 156.325        | S        | Port Operations                                                   | Yes          | Yes           | PORT OPS      |           |
| 67        | 156.375        | 156.375        | S        | Commercial, bridge-to-bridge, 1W with Power-up                    | Yes          | No            | BRIDGE COM    | ③ 1W      |

|           |                |                |          |                                                             |       |       |              |           |
|-----------|----------------|----------------|----------|-------------------------------------------------------------|-------|-------|--------------|-----------|
| 68        | 156.425        | 156.425        | S        | Boat Operations, Recreational                               | Yes   | No    | SHIP - SHIP  |           |
| 69        | 156.475        | 156.475        | S        | Boat Operations, Recreational                               | Yes   | Yes   | PLEASURE     |           |
| 70        | 156.525        | 156.525        |          | Digital Selective Calling - DSC                             | ----- | ----- | DSC          | Ⓞ         |
| 71        | 156.575        | 156.575        | S        | Boat Operations, Recreational                               | Yes   | Yes   | PLEASURE     |           |
| 72        | 156.625        | 156.625        | S        | Boat Operations, Recreational                               | Yes   | No    | SHIP - SHIP  |           |
| 73        | 156.675        | 156.675        | S        | Port Operations                                             | Yes   | Yes   | PORT OPS     |           |
| 74        | 156.725        | 156.725        | S        | Port Operations                                             | Yes   | Yes   | PORT OPS     |           |
| 77        | 156.875        | 156.875        | S        | Port Operations                                             | Yes   | Yes   | PORT OPS     | Ⓛ 1W only |
| 78A       | 156.925        | 156.925        | S        | Boat Operations, Recreational                               | Yes   | No    | SHIP - SHIP  |           |
| 79A       | 156.975        | 156.975        | S        | Commercial                                                  | Yes   | Yes   | COMMERCIAL   |           |
| 80A       | 157.025        | 157.025        | S        | Commercial                                                  | Yes   | Yes   | COMMERCIAL   |           |
| 81A       | 157.075        | 157.075        | S        | U.S. Government, Environmental Protection Agency Operations | Yes   | Yes   | UNAUTHORIZED | Ⓛ         |
| 82A       | 157.125        | 157.125        | S        | U.S. Government, Canadian Coast Guard                       | Yes   | Yes   | UNAUTHORIZED | Ⓛ         |
| 83A       | 157.175        | 157.175        | S        | U.S. Government, Canadian Coast Guard                       | Yes   | Yes   | UNAUTHORIZED | Ⓛ         |
| <b>84</b> | <b>157.225</b> | <b>161.825</b> | <b>D</b> | Public Correspondence, Marine Operator                      | No    | Yes   | TELEPHONE    |           |
| 84A       | 157.225        | 157.225        | S        | Public Correspondence, Marine Operator                      |       |       |              |           |
| <b>85</b> | <b>157.275</b> | <b>161.875</b> | <b>D</b> | Public Correspondence, Marine Operator                      | No    | Yes   | TELEPHONE    |           |
| 85A       | 157.275        | 157.275        | S        | Public Correspondence, Marine Operator                      |       |       |              |           |
| <b>86</b> | <b>157.325</b> | <b>161.925</b> | <b>D</b> | Public Correspondence, Marine Operator                      | No    | Yes   | TELEPHONE    |           |
| 86A       | 157.325        | 157.325        | S        | Public Correspondence, Marine Operator                      |       |       |              |           |
| <b>87</b> | <b>157.375</b> | <b>161.975</b> | <b>D</b> | Public Correspondence, Marine Operator                      | No    | Yes   | TELEPHONE    |           |
| 87A       | 157.375        | 157.375        | S        | Public Correspondence, Marine Operator                      |       |       |              |           |
| <b>88</b> | <b>157.425</b> | <b>162.025</b> | <b>D</b> | Public Correspondence, Marine Operator                      | No    | Yes   | TELEPHONE    |           |
| 88A       | 157.425        | 157.425        | S        | Commercial, Inter-ship Only                                 | Yes   | No    | COMMERCIAL   |           |

### Special Notes on USA Channel Usage

- ①. LOW POWER (1 W) only.
- ②. Receive Only.
- ③. LOW POWER (1 W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normally in bridge-to-bridge communications.
- ④. Lightly shaded simplex channels 03A, 21A, 23A, 61A, 64A, 81A, 82A, and 83A cannot be lawfully used in U.S. waters unless special authorization is obtained from the U.S. Coast Guard. Not for use by the general public.
- ⑤. The letter "A" illuminated by the channel number indicates the USA channel is simplex. This same channel is always duplex when selecting International. There is no "A" reference for International channels. The letter "B" is only used for some Canadian "Receive only" channels.
- Ⓞ. Channel 70 is designated for use exclusively for Digital Selective Calling (DSC), such as Distress, Safety, and Ship Calls. No voice communication is allowed on CH70. This channel is only available on DSC enabled radios.

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

## C-3 CANADA Channel Chart

| CH        | TX (MHz)       | RX (MHz)       | MODE     | TRAFFIC TYPE                                                     | SHIP TO SHIP | SHIP TO SHORE | NAME TAG     | REMARK    |
|-----------|----------------|----------------|----------|------------------------------------------------------------------|--------------|---------------|--------------|-----------|
| <b>01</b> | <b>156.050</b> | <b>160.650</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>02</b> | <b>156.100</b> | <b>160.700</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>03</b> | <b>156.150</b> | <b>160.750</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| 04A       | 156.200        | 156.200        | S        | Canadian Coast Guard, SAR                                        | Yes          | Yes           | CANADIAN CG  |           |
| 05A       | 156.250        | 156.250        | S        | Port Operations, VTS in Selected Areas                           | Yes          | Yes           | PORT OPS/VTS |           |
| 06        | 156.300        | 156.300        | S        | Inter-ship Safety                                                | Yes          | No            | SAFETY       |           |
| 07A       | 156.350        | 156.350        | S        | Commercial                                                       | Yes          | Yes           | COMMERCIAL   |           |
| 08        | 156.400        | 156.400        | S        | Commercial (inter-ship only)                                     | Yes          | No            | COMMERCIAL   |           |
| 09        | 156.450        | 156.450        | S        | Recreational Calling Channel                                     | Yes          | Yes           | CALLING      |           |
| 10        | 156.500        | 156.500        | S        | Commercial                                                       | Yes          | Yes           | COMMERCIAL   |           |
| 11        | 156.550        | 156.550        | S        | Commercial, VTS in Selected Areas                                | Yes          | Yes           | VTS          |           |
| 12        | 156.600        | 156.600        | S        | Port Operations, VTS in Selected Areas                           | Yes          | Yes           | PORT OPS/VTS |           |
| 13        | 156.650        | 156.650        | S        | Inter-ship Navigation Safety (bridge-to-bridge) 1W with power-up | Yes          | No            | BRIDGE COM   | ③ 1W      |
| 14        | 156.700        | 156.700        | S        | Port Operations, VTS in Selected Areas                           | Yes          | Yes           | PORT OPS/VTS |           |
| 15        | 156.750        | 156.750        | S        | Commercial                                                       | Yes          | Yes           | COMMERCIAL   | ① 1W only |
| <b>16</b> | <b>156.800</b> | <b>156.800</b> | <b>S</b> | International Distress, Safety, and Calling                      | Yes          | Yes           | DISTRESS     |           |
| 17        | 156.850        | 156.850        | S        | State Controlled                                                 | Yes          | Yes           | SAR          | ① 1W only |
| 18A       | 156.900        | 156.900        | S        | Commercial                                                       | Yes          | Yes           | COMMERCIAL   |           |
| 19A       | 156.950        | 156.950        | S        | Canadian Coast Guard                                             | Yes          | Yes           | CANADIAN CG  |           |
| <b>20</b> | <b>157.000</b> | <b>161.600</b> | <b>D</b> | Canadian Coast Guard                                             | No           | Yes           | CANADIAN CG  | ① 1W only |
| <b>21</b> | <b>157.050</b> | <b>161.650</b> | <b>D</b> | Port Operations                                                  | No           | Yes           | PORT OPS     |           |
| 21A       | 157.050        | 157.050        | S        | U.S. Government, Canadian Coast Guard                            | Yes          | Yes           | UNAUTHORIZED |           |
| 21B       | ---            | 161.650        | S        | Port Operations                                                  | -----        | -----         | PORT OPS     | RX only   |
| 22A       | 157.100        | 157.100        | S        | Canadian Coast Guard Liaison                                     | Yes          | Yes           | CANADIAN CG  |           |
| <b>23</b> | <b>157.150</b> | <b>161.750</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>24</b> | <b>157.200</b> | <b>161.800</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>25</b> | <b>157.250</b> | <b>161.850</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| 25B       | ---            | 161.850        | S        | Public Correspondence                                            | -----        | -----         | TELEPHONE    | RX only   |
| <b>26</b> | <b>157.300</b> | <b>161.900</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>27</b> | <b>157.350</b> | <b>161.950</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| <b>28</b> | <b>157.400</b> | <b>162.000</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| 28B       | ---            | 162.000        | S        | Public Correspondence                                            | -----        | -----         | TELEPHONE    | RX only   |
| <b>60</b> | <b>156.025</b> | <b>160.625</b> | <b>D</b> | Public Correspondence                                            | No           | Yes           | TELEPHONE    |           |
| 61A       | 156.075        | 156.075        | S        | U.S. Government, Canadian Coast Guard                            | Yes          | Yes           | UNAUTHORIZED | ④         |

|           |                |                |          |                                              |       |       |              |           |
|-----------|----------------|----------------|----------|----------------------------------------------|-------|-------|--------------|-----------|
| 62A       | 156.125        | 156.125        | S        | Canadian Coast Guard                         | Yes   | Yes   | CANADIAN CG  |           |
| <b>64</b> | <b>156.225</b> | <b>160.825</b> | <b>D</b> | Public Correspondence, Duplex                | No    | Yes   | TELEPHONE    |           |
| 64A       | 156.225        | 156.225        | S        | U.S. Government, Canadian Commercial Fishing | Yes   | Yes   | UNAUTHORIZED | ④         |
| 65A       | 156.275        | 156.275        | S        | Port Operations                              | Yes   | Yes   | PORT OPS     |           |
| 66A       | 156.325        | 156.325        | S        | Port Operations                              | Yes   | Yes   | PORT OPS     | ① 1W only |
| 67        | 156.375        | 156.375        | S        | Commercial, SAR                              | Yes   | No    | COMMERCIAL   |           |
| 68        | 156.425        | 156.425        | S        | Boat Operations, Recreational                | Yes   | No    | SHIP - SHIP  |           |
| 69        | 156.475        | 156.475        | S        | Commercial Fishing Only                      | Yes   | Yes   | COMMERCIAL   |           |
| 70        | 156.525        | 156.525        | S        | Digital Selective Calling - DSC              | ----- | ----- | DSC          | ⑥         |
| 71        | 156.575        | 156.575        | S        | Boat Operations, Recreational                | Yes   | Yes   | PLEASURE     |           |
| 72        | 156.625        | 156.625        | S        | Inter-ship                                   | Yes   | No    | SHIP - SHIP  |           |
| 73        | 156.675        | 156.675        | S        | Commercial Fishing Only                      | Yes   | Yes   | COMMERCIAL   |           |
| 74        | 156.725        | 156.725        | S        | Commercial Fishing Only                      | Yes   | Yes   | COMMERCIAL   |           |
| 77        | 156.875        | 156.875        | S        | Port Operations                              | Yes   | Yes   | PORT OPS     | ① 1W only |
| 78A       | 156.925        | 156.925        | S        | Boat Operations, Recreational                | Yes   | No    | SHIP - SHIP  |           |
| 79A       | 156.975        | 156.975        | S        | Commercial                                   | Yes   | Yes   | COMMERCIAL   |           |
| 80A       | 157.025        | 157.025        | S        | Commercial                                   | Yes   | Yes   | COMMERCIAL   |           |
| 81A       | 157.075        | 157.075        | S        | U.S. Government Operations                   | Yes   | Yes   | UNAUTHORIZED | ④         |
| 82A       | 157.125        | 157.125        | S        | U.S. Government, Canadian Coast Guard        | Yes   | Yes   | UNAUTHORIZED | ④         |
| <b>83</b> | <b>157.175</b> | <b>161.775</b> | <b>D</b> | Canadian Coast Guard                         | Yes   | Yes   | CANADIAN CG  |           |
| 83A       | 157.175        | 157.175        | S        | U.S. Government, Canadian Coast Guard        | Yes   | Yes   | UNAUTHORIZED | ④         |
| 83B       | ---            | 161.775        | S        | Canadian Coast Guard, RX Only                | ----- | ----- | CANADIAN CG  |           |
| <b>84</b> | <b>157.225</b> | <b>161.825</b> | <b>D</b> | Public Correspondence, Marine Operator       | No    | Yes   | TELEPHONE    |           |
| <b>85</b> | <b>157.275</b> | <b>161.875</b> | <b>D</b> | Public Correspondence, Marine Operator       | No    | Yes   | TELEPHONE    |           |
| <b>86</b> | <b>157.325</b> | <b>161.925</b> | <b>D</b> | Public Correspondence, Marine Operator       | No    | Yes   | TELEPHONE    |           |
| <b>87</b> | <b>157.375</b> | <b>161.975</b> | <b>D</b> | Public Correspondence, Marine Operator       | No    | Yes   | TELEPHONE    |           |
| <b>88</b> | <b>157.425</b> | <b>162.025</b> | <b>D</b> | Public Correspondence, Marine Operator       | No    | Yes   | TELEPHONE    |           |

### Special Notes on Canada Channel Usage

- ①. LOW POWER (1 W) only.
- ②. Receive Only.
- ③. LOW POWER (1 W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normally in bridge-to-bridge communications.
- ④. Lightly shaded simplex channels 21A, 23A, 61A, 64A, 81A, 82A, and 83A cannot be lawfully used in Canada waters unless special authorization is obtained from the Canadian Coast Guard. Not for use by the general public.
- ⑤. The letter "A" illuminated by the channel number indicates the Canada channel is simplex. This same channel is always duplex when selecting International. There is no "A" reference for International channels. The letter "B" is only used for some Canadian

“Receive only” channels.

- Ⓢ Channel 70 is designated for use exclusively for Digital Selective Calling (DSC), such as Distress, Safety, and Ship Calls. No voice communication is allowed on CH70.

This channel is only available on DSC enabled radios.

**Note:** The CANADA mode is not legal to use in U.S. waters.

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

## ***C-4 US & Canada WEATHER Channels***

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| <b>CH</b> | <b>RX (MHz)</b> | <b>TRAFFIC TYPE</b>      | <b>NAME</b> | <b>REMARK</b> |
|-----------|-----------------|--------------------------|-------------|---------------|
| WX01      | 162.550         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX02      | 162.400         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX03      | 162.475         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX04      | 162.425         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX05      | 162.450         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX06      | 162.500         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX07      | 162.525         | NOAA Weather Channel     | NOAA WX     | RX only       |
| WX08      | 161.650         | CANADIAN Weather Channel | CANADA WX   | RX only       |
| WX09      | 161.775         | CANADIAN Weather Channel | CANADA WX   | RX only       |
| WX10      | 163.275         | NOAA Weather Channel     | NOAA WX     | RX only       |

## C-5 EAS (Emergency Alert Systems) Alerts

| <b>National Codes<br/>Nature of Activation</b> | <b>Event Codes</b> | <b>Message</b> |
|------------------------------------------------|--------------------|----------------|
| Emergency Action Notification (National only)  | EAN                | WARNING        |
|                                                | EAT                | ADVISORY       |
| National Information Center                    | NIC                | ADVISORY       |
| National Periodic Test                         | NPT                | TEST           |
| Required Monthly Test                          | RMT                | TEST           |
| Required Weekly Test                           | RWT                | TEST           |

| <b>State and Local Codes<br/>Nature of Activation</b> | <b>Event Codes</b> | <b>Message</b> |
|-------------------------------------------------------|--------------------|----------------|
| Avalanche Warning                                     | AVW                | WARNING        |
| Avalanche Watch                                       | AVA                | WATCH          |
| Blizzard Warning                                      | BZW                | WARNING        |
| Child Abduction Emergency                             | CAE                | WARNING        |
| Civil Danger Warning                                  | CDW                | WARNING        |
| Civil Emergency Message                               | CEM                | WARNING        |
| Coastal Flood Warning                                 | CFW                | WARNING        |
| Coastal Flood Watch                                   | CFA                | WATCH          |
| Dust Storm Warning                                    | DSW                | WARNING        |
| Earthquake Warning                                    | EQW                | WARNING        |
| Evacuation Immediate                                  | EVI                | WARNING        |
| Fire Warning                                          | FRW                | WARNING        |
| Flash Flood Warning                                   | FFW                | WARNING        |
| Flash Flood Watch                                     | FFA                | WATCH          |
| Flash Flood Statement                                 | FFS                | ADVISORY       |
| Flood Warning                                         | FLW                | WARNING        |
| Flood Watch                                           | FLA                | WATCH          |
| Flood Statement                                       | FLS                | ADVISORY       |
| Hazardous Materials Warning                           | HMW                | WARNING        |
| High Wind Warning                                     | HWW                | WARNING        |
| High Wind Watch                                       | HWA                | WATCH          |

| <b>State and Local Codes<br/>Nature of Activation</b> | <b>Event Codes</b> | <b>Message</b> |
|-------------------------------------------------------|--------------------|----------------|
| Hurricane Warning                                     | HUW                | WARNING        |
| Hurricane Watch                                       | HUA                | WATCH          |
| Hurricane Statement                                   | HLS                | ADVISORY       |
| Law Enforcement Warning                               | LEW                | WARNING        |
| Local Area Emergency                                  | LAE                | WARNING        |
| 911 Telephone Outage Emergency                        | TOE                | WARNING        |
| Nuclear Power Plant Warning                           | NUW                | WARNING        |
| Radiological Hazard Warning                           | RHW                | WARNING        |
| Severe Thunderstorm Warning                           | SVR                | WARNING        |
| Severe Thunderstorm Watch                             | SVA                | WATCH          |
| Severe Weather Statement                              | SVS                | ADVISORY       |
| Shelter in Place Warning                              | SPW                | WARNING        |
| Special Marine Warning                                | SMW                | WARNING        |
| Special Weather Statement                             | SPS                | ADVISORY       |
| Tornado Warning                                       | TOR                | WARNING        |
| Tornado Watch                                         | TOA                | WATCH          |
| Tropical Storm Warning                                | TRW                | WARNING        |
| Tropical Storm Watch                                  | TRA                | WATCH          |
| Tsunami Warning                                       | TSW                | WARNING        |
| Tsunami Watch                                         | TSA                | WATCH          |
| Volcano Warning                                       | VOW                | WARNING        |
| Winter Storm Warning                                  | WSW                | WARNING        |
| Winter Storm Watch                                    | WSA                | WATCH          |

For more information about the Emergency Alert System and event codes, visit:  
[http://www.nws.noaa.gov/os/eas\\_codes.shtml](http://www.nws.noaa.gov/os/eas_codes.shtml)

## Appendix D - EU VHF Marine Channel Charts

The following channel charts are provided for reference only and may not be correct for all regions. It is the operators responsibility to ensure correct channels and frequencies are used for local regulations. For specific channel information for your country, please refer to local authorities.

### D-1 EU International Channel Chart

| CH | TX (MHz) | RX (MHz) | MODE | TRAFFIC TYPE                                    | SHIP TO SHIP | SHIP TO SHORE | NAME TAG     | REMARK    |
|----|----------|----------|------|-------------------------------------------------|--------------|---------------|--------------|-----------|
| 01 | 156.050  | 160.650  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 02 | 156.100  | 160.700  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 03 | 156.150  | 160.750  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 04 | 156.200  | 160.800  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 05 | 156.250  | 160.850  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 06 | 156.300  | 156.300  | S    | Inter-ship Safety                               | Yes          | No            | SAFETY       |           |
| 07 | 156.350  | 160.950  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 08 | 156.400  | 156.400  | S    | Commercial (inter-ship only)                    | Yes          | No            | SHIP-SHIP    |           |
| 09 | 156.450  | 156.450  | S    | Inter-ship                                      | Yes          | Yes           | SHIP-SHIP    |           |
| 10 | 156.500  | 156.500  | S    | Inter-ship                                      | Yes          | Yes           | SHIP-SHIP    |           |
| 11 | 156.550  | 156.550  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS     |           |
| 12 | 156.600  | 156.600  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS     |           |
| 13 | 156.650  | 156.650  | S    | Inter-ship Navigation Safety (bridge-to bridge) | Yes          | No            | SAFETY COM   |           |
| 14 | 156.700  | 156.700  | S    | Port Operations                                 | Yes          | Yes           | PORT OPS     |           |
| 15 | 156.750  | 156.750  | S    | Inter-ship                                      | Yes          | Yes           | PORT OPS     | ⊙ 1W only |
| 16 | 156.800  | 156.800  | S    | International Distress, Safety, and Calling     | Yes          | Yes           | DISTRESS     |           |
| 17 | 156.850  | 156.850  | S    | Inter-ship                                      | Yes          | Yes           | PORT OPS     | ⊙ 1W only |
| 18 | 156.900  | 161.500  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 19 | 156.950  | 161.550  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 20 | 157.000  | 161.600  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 21 | 157.050  | 161.650  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 22 | 157.100  | 161.700  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 23 | 157.150  | 161.750  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 24 | 157.200  | 161.800  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 25 | 157.250  | 161.850  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 26 | 157.300  | 161.900  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 27 | 157.350  | 161.950  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 28 | 157.400  | 162.000  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 60 | 156.025  | 160.625  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |
| 61 | 156.075  | 160.675  | D    | Public Correspondence, Port Op                  | No           | Yes           | PHONE-PORTOP |           |



|    |         |         |   |                                 |       |       |              |           |
|----|---------|---------|---|---------------------------------|-------|-------|--------------|-----------|
| 62 | 156.125 | 160.725 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 63 | 156.175 | 160.775 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 64 | 156.225 | 160.825 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 65 | 156.275 | 160.875 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 66 | 156.325 | 160.925 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 67 | 156.375 | 156.375 | S | Commercial, bridge-to-bridge    | Yes   | No    | SHIP-SHIP    |           |
| 68 | 156.425 | 156.425 | S | Port Operations                 | Yes   | No    | PORT OPS     |           |
| 69 | 156.475 | 156.475 | S | Inter-ship                      | Yes   | Yes   | SHIP-SHIP    |           |
| 70 | 156.525 | 156.525 | - | Digital Selective Calling - DSC | ----- | ----- | DSC          | ②         |
| 71 | 156.575 | 156.575 | S | Port Operations                 | Yes   | Yes   | PORT OPS     |           |
| 72 | 156.625 | 156.625 | S | Inter-ship                      | Yes   | No    | SHIP-SHIP    |           |
| 73 | 156.675 | 156.675 | S | Inter-ship                      | Yes   | Yes   | SHIP-SHIP    |           |
| 74 | 156.725 | 156.725 | S | Port Operations                 | Yes   | Yes   | PORT OPS     |           |
| 75 | 156.775 | 156.775 | S | Port Operations                 | Yes   | Yes   | PORT OPS     | ① 1W only |
| 76 | 156.825 | 156.825 | S | Port Operations                 | Yes   | Yes   | PORT OPS     | ① 1W only |
| 77 | 156.875 | 156.875 | S | Inter-ship                      | Yes   | No    | SHIP-SHIP    |           |
| 78 | 156.925 | 161.525 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 79 | 156.975 | 161.575 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 80 | 157.025 | 161.625 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 81 | 157.075 | 161.675 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 82 | 157.125 | 161.725 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 83 | 157.175 | 161.775 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 84 | 157.225 | 161.825 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 85 | 157.275 | 161.875 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 86 | 157.325 | 161.925 | D | Public Correspondence, Port Op  | No    | Yes   | PHONE-PORTOP |           |
| 87 | 157.375 | 157.375 | S | Port Operations                 | No    | Yes   | PORT OPS     | ③         |
| 88 | 157.425 | 157.425 | S | Port Operations                 | No    | Yes   | PORT OPS     | ③         |

### Special Notes on EU International Channel Usage

- ①. LOW POWER (1W) only.
- ②. Channel 70 is designated for use exclusively for Digital Selective Calling (DSC), such as Distress, Safety, and Ship Calls. No voice communication is allowed on CH70. This channel is only available on DSC enabled radios.
- ③. Maybe Duplex in some regions

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

## D-2 Inland Waterways Country Specific table - ATIS ON

For specific channel information for your country, please refer to local authorities.

| CH | SPECIFIC FOOT-NOTES | TRANSMITTING FREQUENCY (MHZ) |         | SHIP-TO-SHIP                                               | SHIP-TO PORT | NAUTICAL INFORMATION |
|----|---------------------|------------------------------|---------|------------------------------------------------------------|--------------|----------------------|
|    |                     | SHIP                         | LAND    |                                                            |              |                      |
| 60 | a)                  | 156.025                      | 160.625 |                                                            |              | x                    |
| 01 | a)                  | 156.05                       | 160.65  |                                                            |              | x                    |
| 61 | a)                  | 156.075                      | 160.675 |                                                            |              | x                    |
| 02 | a)                  | 156.1                        | 160.7   |                                                            |              | x                    |
| 62 | a)                  | 156.125                      | 160.725 |                                                            |              | x                    |
| 03 | a)                  | 156.15                       | 160.75  |                                                            |              | x                    |
| 63 | a)                  | 156.175                      | 160.775 |                                                            |              | x                    |
| 04 | a)                  | 156.2                        | 160.8   |                                                            |              | x                    |
| 64 | a)                  | 156.225                      | 160.825 |                                                            |              | x                    |
| 05 | a)                  | 156.25                       | 160.85  |                                                            |              | x                    |
| 65 | a)                  | 156.275                      | 160.875 |                                                            |              | x                    |
| 06 | a) b)               | 156.3                        | 156.3   | x                                                          |              |                      |
| 66 | a)                  | 156.325                      | 160.925 |                                                            |              | x                    |
| 07 | a)                  | 156.35                       | 160.95  |                                                            |              | x                    |
| 67 | a) c)               | 156.375                      | 156.375 |                                                            |              | x                    |
| 08 | a) q)               | 156.4                        | 156.4   | x                                                          |              |                      |
| 68 | a)                  | 156.425                      | 156.425 |                                                            |              | x                    |
| 09 | a) b) c)            | 156.45                       | 156.45  |                                                            |              | x                    |
| 69 | a)                  | 156.475                      | 156.475 |                                                            |              | x                    |
| 10 | e)                  | 156.5                        | 156.5   | x                                                          |              |                      |
| 70 | a)                  | 156.525                      | 156.525 | Digital selective calling for distress, safety and calling |              |                      |
| 11 |                     | 156.55                       | 156.55  |                                                            | x            |                      |
| 71 |                     | 156.575                      | 156.575 |                                                            | x            |                      |
| 12 |                     | 156.6                        | 156.6   |                                                            | x            |                      |
| 72 | a) r)               | 156.625                      | 156.625 | x                                                          |              |                      |
| 13 | f)                  | 156.65                       | 156.65  | x                                                          |              |                      |
| 73 | f) g)               | 156.675                      | 156.675 |                                                            |              | x                    |
| 14 | q)                  | 156.7                        | 156.7   |                                                            | x            |                      |
| 74 | a)                  | 156.725                      | 156.725 |                                                            | x            |                      |
| 15 | h)                  | 156.75                       | 156.75  |                                                            |              | x                    |
| 75 | o)                  | 156.775                      | 156.775 |                                                            | x            |                      |
| 16 | i)                  | 156.8                        | 156.8   |                                                            |              | x                    |
| 76 | j) d) o)            | 156.825                      | 156.825 |                                                            |              | x                    |
| 17 | h)                  | 156.85                       | 156.85  |                                                            |              | x                    |

|       |       |         |         |   |  |   |
|-------|-------|---------|---------|---|--|---|
| 77    | a) k) | 156.875 | 156.875 | x |  |   |
| 18    |       | 156.9   | 161.5   |   |  | x |
| 78    |       | 156.925 | 161.525 |   |  | x |
| 19    |       | 156.95  | 161.55  |   |  | x |
| 79    | a)    | 156.975 | 161.575 |   |  | x |
| 20    |       | 157     | 161.6   |   |  | x |
| 80    |       | 157.025 | 161.625 |   |  | x |
| 21    | a)    | 157.05  | 161.65  |   |  | x |
| 81    | a)    | 157.075 | 161.675 |   |  | x |
| 22    |       | 157.1   | 161.7   |   |  | x |
| 82    | l) m) | 157.125 | 161.725 |   |  | x |
| 23    | m)    | 157.15  | 161.75  |   |  | x |
| 83    | a) m) | 157.175 | 161.775 |   |  | x |
| 24    | m)    | 157.2   | 161.8   |   |  | x |
| 84    | m)    | 157.225 | 161.825 |   |  | x |
| 25    | m)    | 157.25  | 161.85  |   |  | x |
| 85    | a) m) | 157.275 | 161.875 |   |  | x |
| 26    | m)    | 157.3   | 161.9   |   |  | x |
| 86    | a) m) | 157.325 | 161.925 |   |  | x |
| 27    | m)    | 157.35  | 161.95  |   |  | x |
| 87    | a) d) | 157.375 | 157.375 |   |  | x |
| 28    | m)    | 157.4   | 162     |   |  | x |
| 88    | a) p) | 157.425 | 157.425 |   |  | x |
| ALS 1 | a) n) | 161.975 | 161.975 |   |  |   |
| ALS 2 | a) n) | 162.025 | 162.025 |   |  |   |

### General remarks to Country Specific table:

- 1 The channels for service categories ship-to-ship and nautical information may also be used for vessel traffic -systems by traffic centres.
- 2 In some countries, frequencies certain channels are used for an other service category or other radio services. These countries are Austria, Bulgaria, Croatia, the Federal Republic of Yugoslavia, Hungary, Moldova, Romania, the Russian Federation, the Slovak Republic, the Czech Republic (with exemption of channels 08, 09, 72, 74 and 86), Ukraine and the Federal Republic of Yugoslavia. The Administrations concerned should make any possible attempt to make these frequencies channels as soon as possible available for the radiotelephone service on Inland Waterways and/or the required service category.

## Explanation of specific footnotes in Country Specific table:

- a. In the countries mentioned under remark 2, it is strictly prohibited to use this channel.
- b. This channel is not allowed to be used between Rhine km 150 and km 350.
- c. In the Netherlands, this channel is used by its on-scene communications during safety operations on the North Sea, IJsselmeer, Waddenzee, Ooster- and Westerschelde.
- d. This channel may also be used for piloting, mooring, tugging and for other nautical purposes.
- e. This channel is the first ship-to-ship channel, unless the competent authority has designated an other channel. In the countries mentioned under remark 2, it is allowed that the output power is set to a value between 6 and 25 W until 1 January 2005.
- f. In the countries mentioned under remark 2, this channel is used for service category ship-to-port authorities.
- g. In the Netherlands, this channel is used by its national coastguard for communications during oil pollution operations on the North Sea and for safety messages for the North Sea, Waddenzee, IJsselmeer, Ooster- and Westerschelde.
- h. This channel may be used only for service category on-board communications.
- i. This channel may be used only for communications between seagoing vessels and participating land stations in case of distress and safety communications within the maritime sea-areas. In the countries mentioned under remark 2, this channel may be used only for distress, safety and calling.
- j. The output power shall be reduced automatically to a value between 0.5 and 1 W.
- k. This channel may be used for communications with a social character.
- l. In the Netherlands and Belgium, this channel may be used for transmitting messages concerning bunkering and victualling. The output power has to be reduced manually to a value between 0.5 and 1 W.
- m. This channel may also be used for public correspondence.
- n. This channel will be used for an automatic ship identification and surveillance system (AIS) capable of providing worldwide operating on seas and Inland Waterways.
- o. The availability of this channel is on a voluntary basis. All existing equipment shall be capable to of operating on this channel within a ten-year period after the entry into force of this Arrangement.
- p. After permission of the competent authority, this channel may be used only for special events on a temporary basis.
- q. In the Czech Republic this channel is used for service category nautical information.
- r. In the Czech Republic this channel is used for service category ship-to-port authorities.

## D-3 Special Channels

| Country                                      | Item    | Chart       | Primary channel                                                    |
|----------------------------------------------|---------|-------------|--------------------------------------------------------------------|
| EU Standard, France, Greece, Spain, Portugal | DSC ON  | EUR Default |                                                                    |
| UK                                           | DSC ON  | EUR Default | M, M2                                                              |
| Belgium                                      | DSC ON  | EUR Default | 31, 37, 96 (1W)                                                    |
|                                              | ATIS ON | EUR Default | 31, 96 (1W)                                                        |
| Norway, Finland                              | DSC ON  |             | L1, L2, L3, F1, F2, F3                                             |
| Sweden, Denmark                              | DSC ON  |             | L1, L2, F1, F2, F3                                                 |
| Italy                                        | DSC ON  |             |                                                                    |
| Italy (with Coast)                           | DSC ON  |             | A0, A1, A2, A3, A4, A5, A6, C0, C1, C2, C3, C4, C5, C6, C7, C8, C9 |
| Holland                                      | DSC ON  |             | 31 (1W), 37                                                        |
|                                              | ATIS ON | EUR Default | 31 (1W)                                                            |
| Germany                                      | DSC ON  |             |                                                                    |
|                                              | ATIS ON | EUR Default |                                                                    |
| Austria, Newsland                            | DSC ON  | EUR Default |                                                                    |
|                                              | ATIS ON | EUR Default |                                                                    |

## Appendix E - MMSI and License Information

You must obtain a user MMSI (Marine Mobile Service Identity) and enter it into your Link-8 in order to use the DSC functions. Contact the appropriate authorities in your country. If you are unsure who to contact, consult your Lowrance dealer.

The user MMSI is a unique nine digit number, similar to a personal telephone number. It is used on marine transceivers that are capable of using DSC (Digital Select Calling).

Depending upon your location, you may need a radio station license for the Link-8. You may also need an individual operator's license.

**Lowrance recommends that you check the requirements of your national radio communications authorities before operating DSC functions.**

### Countries of Intended use in the EU:

|                     |                    |                     |
|---------------------|--------------------|---------------------|
| AT - Austria        | HU - Hungary       | PL - Poland         |
| BE - Belgium        | IS - Iceland       | PT - Portugal       |
| BG - Bulgaria       | IE - Ireland       | RO - Romania        |
| CY - Cyprus         | IT - Italy         | SK - Slovakia       |
| CZ - Czech Republic | LI - Liechtenstein | SI - Slovenia       |
| DK - Denmark        | LV - Latvia        | ES - Spain          |
| EE - Estonia        | LT - Lithuania     | SE - Sweden         |
| FI - Finland        | LU - Luxembourg    | CH - Switzerland    |
| FR - France         | MT - Malta         | TR - Turkey         |
| DE - Germany        | NL - Netherlands   | UK - United Kingdom |
| GR - Greece         | NO - Norway        |                     |



### CAUTION

*Under extreme operating conditions, the temperature of the rear heat-sink on this radio may exceed normal surface temperatures. Caution is advised to prevent possible skin burns.*



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CE11770