

PLACEHOLDER ONLY
ACTUAL TYPEFACE and
STAR TO BE ADDED

NORTHSTAR*

NS100 SS (Single Station)
NS100 DS (Dual Station)

Quickstart Guide and Reference Manual



PLACEHOLDER ONLY
PICTURE OF
COMPLETE RADIO
REQUIRED

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide a reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna.
- increase the separation between the equipment and receiver.
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- consult the dealer or an experienced radio/TV technician for help.

RF Emissions Notice:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device's antenna must be installed in accordance with provided instructions; and it must be operated with minimum 96 cm spacing between the antennas and all person's body (excluding extremities of hands, wrist and feet) during operation. Further, this transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

IMPORTANT

- 1. DSC functions will not operate until a valid MMSID has been entered into the radio. The user MMSID is a unique nine digit number, similar to a personal telephone number. It is used on marine transceivers that have DSC (Digital Selective Calling) capability. You must obtain your user MMSID from the appropriate authorities in your country. If you are not sure who to contact, consult your Northstar dealer for advice.**
- 2. The radio channels installed into the radio may vary from country to country, depending on the model and on government or national communications authority regulations.**
- 3. Depending on your location, you may need a radio station license for the radio. You may also need an individual operator's licence. We recommend that you check the radio operating licensing requirements of your country before using the radio. The operator is solely responsible for observing proper radio installation and usage practices.**
- 4. A DSC warning label is supplied with the radio. To comply with FCC regulations, this warning label must be affixed in a location that is clearly visible from the operating controls of this radio. Make sure that the chosen location is clean and dry before applying this warning label.**

Northstar NS100

Quickstart Guide and Reference Manual

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Getting Started

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This chapter introduces this manual and the NS100 radio, and explains a few things you should know to keep your radio in top condition.

Welcome to the NS100 radio

Congratulations on your purchase of a Northstar NS100 radio! There are two models available; the NS100 SS (Single System) and the NS100 DS (Dual System). Both provide the following useful features:

- an alphanumeric handset with built-in LCD screen for easy operation and information display.
- local/distance mode to eliminate noise in high traffic urban areas
- adjustable contrast settings for the handset screen
- adjustable keypad backlighting for easy night-time use
- waterproof and submersible handset to comply with JIS-7
- powerful 4W external speaker audio output
- access to all currently-available marine VHF channel banks (USA, Canada, International) including weather channels where available
- special 3CH button to select your three favourite channels
- MMSID storage for your three favourite groups

- DSC (Digital Selective Calling) capability that meets USCG SC101 Standards. *USA only.*
- DSC (Digital Selective Calling) capability that meets EC Class D Standards. *Europe only.*
- PSCAN (similar to dual watch) facility
- DISTRESS call button to automatically transmit your MMSID and position until an acknowledgement is received
- easy access to a buddy list (maximum of 20 favourite people)
- group calling and all ships calling facility
- LL position polling information
- weather alert facility. *US only.*
- ATIS facility for inland waterways. *Europe only.*

The NS100 DS provides the following additional features:

- a second alphanumeric handset
- a second 4W external speaker
- intercom facility between the two handsets
- foghorn mode for use in reduced visibility
- hailer function with powerful 20W output through a Hailer Horn (optional).

Using this manual

This manual is divided into two main sections:


- The **QuickStart Guide** has all the basic information you need to operate your radio. Be sure to read this section as you start to use the radio.
- The **Reference Sections** provide more detailed information about each function.

Use these sections to learn more about the radio and get the most out of it.

Check the mini table of contents at the start of each section, or the index at the end of the manual, to quickly find information on a particular topic.

Conventions

This manual uses certain conventions to provide a consistent means of recognizing specific information, as follows:

-  is used for warning information related to your personal safety or possible damage to the radio. These warning notes contain critical information - please read them!
- "Press" means push and immediately release the button.
- "Hold down" means keep the button depressed for the specified time.
- **LOCAL.** Words looking like this indicate a menu option on the LCD screen of the handset, OR a button name.

Maintaining the radio

To help maintain your radio at peak operating performance, we recommend that you:

- hang the handset on the customized bracket when you're not using it.
- use a soft cloth dampened in water to wipe any dirt or salt from the handset, cable, or speaker.
- use a small amount of window cleaner on a soft cloth to remove any grease, oil, or fingerprints from the LCD screen.

Technical support

If you need technical support, or have any other questions that this manual or your dealer cannot answer, you can contact the factory as follows:

by telephone (USA only):

1-800-628-4487
1-978-897-6600

by email:

Service: service@NorthstarNav.com
Sales: sales@NorthstarNav.com

by mail:

BNT Marine Electronics
30 Sudbury Road
Acton, MA 01720
USA

Additional information is available at Northstar's website:

www.NorthstarNav.com

Quickstart Guide

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This section explains the basic operation of the NS100 radio. We suggest that you read this section carefully when you first start using your radio, and then refer to the Reference Sections for more information if necessary.

Turn the radio on and off

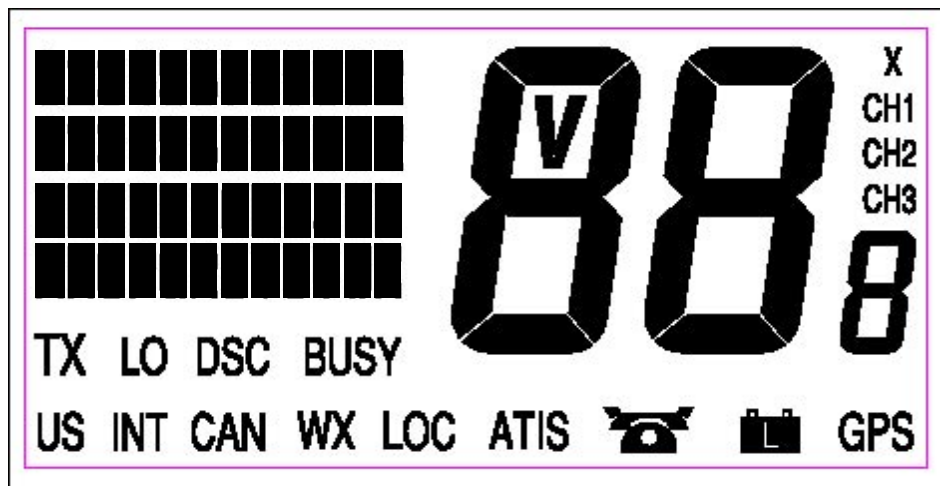
Use the rotary knob on the speaker to turn the radio on and off, and to adjust the volume.

Turn clockwise (right) to turn on. A white indicator light appears. Turn counter-clockwise (left) to turn off. When you turn off the radio,



it remembers the last working channel and displays this when you turn the radio on again.

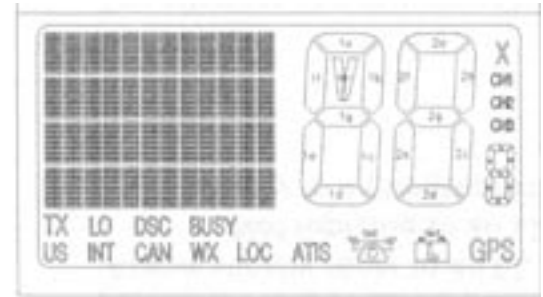
The radio has a variety of beep tones to indicate different operations, but the beeps will not sound if you set the volume level to zero.

LCD screen symbols



Symbol	Meaning	Symbol	Meaning
TX	transmitting.	USA INT CAN	channel bank selected for VHF radio operations and regulations (USA/Canada only).
LO	transmission power is LO (low) 1W. If blank, the transmission power is HI (high) 25W.	WX	weather channel (USA/Canada only).
DSC	DSC functions are available.	LOC	receiver sensitivity for local calling is selected. If blank, distance calling is selected.
BUSY	receiver is busy with an incoming signal.		

Symbol	Meaning
ATIS	ATIS is enabled. (<i>Europe only</i>). Otherwise blank.
	indicates an incoming DSC call, or blinks to notify you of any unread call log messages.
	low battery warning (activates at 10.8V DC).
GPS	indicates that the NMEA GPS input is missing or invalid.
88	channel selected. V indicates an EU special channel, e.g. M1.
X	channel is temporarily deleted from the ALL SCAN operation.
8	channel suffix, if applicable to the selected channel. Usually A or B.



PLACEHOLDER

A typical operational display is shown. In this,
.....

Enter alphanumeric data

Use the handset buttons to enter channel numbers or names, for radio functions, and for menu editing. Each button has the functionality shown in the table.

Press **>ENT** to move the cursor to the next position when you enter a Buddy Name or a Channel Name. Otherwise, the cursor moves automatically to the next position when entering data (similar to a cell phone). Also press **>ENT** to confirm any input or changes.

Press **<ESC** to backup if you make a mistake, or to cancel any changes and return to the previous mode.

Press:	x1	x2	x3	x4	x5
button 1	1	-	.	°	/
button 2	2	A	B	C	?
button 3	3	D	E	F	!
button 4	4	G	H	I	:
button 5	5	J	K	L	#
button 6	6	M	N	O	+
button 7	7	P	Q	R	S
button 8	8	T	U	V	;
button 9	9	W	X	Y	Z
button 0	0	Space	()	%

Handset button functions



All possible buttons and their functions are described. Some of the buttons may not work or may not be available, depending on your location and your NS100 radio model.

A single beep sounds whenever you press a button. A double beep sounds to indicate an invalid key or an error. (The beeps won't sound if the volume is set to zero.)

Button

Function



Channel selection. In normal mode, press to step through the channels one at a time or hold down for rapid selection.

In menu mode, press to step through the menu options.



Three favorite channels. Press repeatedly to cycle through your three favorite channels.



Priority channel. USA/Canada only. Press to cancel the current mode and tune into the priority channel. Press again to return to your original mode.

CH16 is the default. To make CH9 the default instead, hold down **16/9** until 09 is displayed on the LCD screen.



Priority channel. Europe only. Press to cancel the current mode and tune into CH16. Press again to return to your original mode.

Button

Function



DSC call menu. Press to display the DSC call menu and to make different types of DSC calls.



Scan. Press to start a dual (DW) or triple (TRI) watch scan. Hold down to start an all scan. Press again to stop scanning.



Weather channel. USA/Canada only. Press to hear the most recently used weather channel. Press again to return to your previous mode.







Squelch adjustment. Press **^SQ** to increase or **SQv** to decrease the squelch (threshold level). (Also see *Adjust the squelch.*)



Volume. (Buttons located on the right hand side of handset). Press **^VOL** to increase or **VOLv** to decrease the speaker volume. (Also see *Adjust the volume.*)



Press To Talk. (Button located on left hand side of handset). Press at any time to transmit on an allowed channel. (Some channels are restricted and do not allow transmissions. Appendix C has detailed information on channels.)

Button	Function	Button	Function
	Escape. Press to cancel any changes, return to the previous mode, or backup.	FUNC 6	Intercom. <i>NS100 DS only.</i> Pick up your handset, then press FUNC then 6 to activate the intercom. (Also see <i>Use the intercom on the NS100 DS.</i>)
	Enter. Press to confirm and accept any input or changes.	FUNC 7	Transmission power. Press FUNC then 7 to change the transmission power setting. Press FUNC then 7 again to return to the previous setting.
	Function. Provides access to the following useful radio functions when combined with the button number indicated:	FUNC 9	Fog mode. Press FUNC then 9 to enter the fog mode. (Also see <i>Use the foghorn.</i>)
FUNC 1	Radio Menu mode. Press FUNC then 1 to display the radio menu and DSC setup options and to enter menu mode. (Also see <i>Reference Section 1</i> and <i>Reference Section 2.</i>)		Distress. (Red button located on right hand side of handset). To make a distress call, lift the hinged protective cover from the button. Then either <i>press</i> DISTRESS to show the Nature of Distress categories OR hold down DISTRESS to send an undefined distress call. (Also see <i>Reference Section 5 - Send a Distress call.</i>)
FUNC 3	Backlighting. Press FUNC then 3 to set the backlight level for the LCD screen and handset buttons. (Also see <i>Adjust the backlighting.</i>)		
FUNC 4	Hailer. <i>NS100 DS only.</i> Press FUNC then 4 to enter hailer mode. (Also see <i>Use the hailer on the NS100 DS.</i>)		

Display and navigate a menu

Only a few menu options can be displayed at any one time on the LCD screen. To show the menu options:

1. Press **FUNC** then press **1** to display the first four radio menu options OR press **CALL** to display the DSC call menu.
2. Press **^CH/SEL** or **CH/SELv** to scroll up and down the menu until the cursor is positioned at the desired option.
3. Press **>ENT** to display that option. Make any entries or changes, if required.
4. Press **>ENT** to confirm changes OR press **<ESC** to keep the original entry. Any changes are active as soon as you exit the menu.
5. Press **<ESC** to backup to the previous screen or to exit the menu completely.

Customise your radio

You can customize the radio to suit your individual preferences. You can set some preferences directly, using the handset buttons as explained in this section.

Other preferences can be set up only through the menus and these are explained in the Reference Sections.

Adjust the volume

Use the **VOL** buttons on the right hand side of the handset to adjust the volume. There are ten volume levels available.

Press **^VOL** once to increase the volume by one level. Press **VOLv** once to decrease the volume by one level. The current level is

shown as a percentage on the LCD screen, e.g. **VOLUME 30%**.

Hold down either of the buttons to change the volume levels automatically until the limit is reached.

Select the TX power

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

You can set the transmission power to either high (25W output) or low (1W output).

If LO is shown in the LCD screen, low transmission power is selected; if the LCD screen does not show LO, high transmission power is selected.

To change from one selection to the other, press **FUNC** then press **7**. Press **FUNC** then **7** again to change back.

Adjust the backlighting

You can adjust the backlighting of the LCD screen and keypad simultaneously. (To adjust the contrast, see *Reference Section 1 - Set the contrast.*)

There are four backlight settings;

- OFF (no backlighting)
- LO (low)
- MID (medium)
- HI (maximum)

To adjust the backlighting, press **FUNC** then **3**

to enter the backlight mode. The current setting is shown on the LCD screen, e.g. **DIMMER LO**.

Use **^CH/SEL** and **CH/SELv** to select your desired setting. If you select **OFF**, the LO setting will operate for 5 seconds whenever you make a keypad entry so you can check your entry is correct.

If you have the NS100 DS radio, you can adjust the backlighting for each handset independently.

Adjust the squelch

You can adjust the squelch (the threshold level) for the minimum receiver signal. There are ten settings available.

Press **^SQ** once to increase the squelch by one step. Press **vSQ** once to decrease the squelch by one step. The current setting is shown as a percentage on the LCD screen, e.g. **SQUELCH 30%**.

Hold down either button to change the squelch automatically until the threshold limit is reached.

If you have the NS100 DS radio and change the squelch on one handset, the new level is automatically applied to the other handset too.

The optimum squelch setting will improve reception. Decrease the squelch until random

noise is heard, then increase it one step at a time until the random noise disappears. For best reception in open sea conditions, increase the squelch one more step.

In areas of high noise (e.g. close to large cities or pager broadcast sites) reception may improve if the squelch is increased or the LOCAL setting is used. (See *Reference Section 1 - Set the radio sensitivity.*)

A special antenna RF reverse current monitoring circuit will automatically reduce the transmission power to 1W if a failed or open antenna is detected.

Select the channel bank

In Europe, only the INT (International) channel bank is available and it cannot be changed.

If you are based in the USA or Canada, there is a choice of 3 channel banks; USA, INT (International), and CAN (Canadian). The channel bank that is currently selected is shown on the LCD screen.

Use the radio menu if you want to change the channel bank. See *Reference Section 1 - Select the channel bank.*

Select a channel

When you turn the radio on, it automatically tunes to the last working channel OR to the suffix channel if the normal channel is not available in the channel charts.

The channel number is shown in very big digits on the LCD screen. The channel suffix (if applicable) is shown at a smaller size.

To change the channel, you can EITHER enter the channel number directly using the keypad OR

press **^CH/SEL** to step up or **CH/SELv** to step down to the next channel. To rapidly scroll through the channels, just hold down **^CH/**

SEL or **CH/SELv** until the desired channel is reached.

Error beeps will sound if you try to select a channel that is not allowed.

Some examples on selecting a channel (USA channel bank) are given:

- Press **1** then **8** to select CH18A.
- Press **2** then **0** to select CH20, then press **^CH/SEL** to select CH20A (suffix A channel).
- Press **2** then **0** then **2** again to select CH20A (suffix A channel).

Make a call

Hold down the PTT (Press To Talk) button on the left hand side of the handset to transmit on an allowable channel. The channel number and TX are shown on the LCD screen.

When you press PTT the NS100 radio automatically exits from any menu and stops scanning. You must release PTT to receive a call.

A built-in timer will automatically shut down a transmission after five minutes and sound a warning beep. A warning message is also shown on the LCD screen.

Some channels are restricted and do not allow transmissions. Check out Appendix C for a complete listing of channels.

Store 3 favorite channels

You can store one, two or three channels as favorites.

Select the first channel that you want to store, then hold down **3CH** for about two seconds to store it as CH1. Repeat the procedure to store two more favorite channels as CH2 and CH3

respectively.

If you try to store another favorite channel, the radio asks: *OVERWRITE CH3?*

If you press **>ENT** to confirm, CH3 is overwritten with the new channel.

Select a favorite channel

Press **3CH** to display the first favorite channel. Repeat the procedure, if necessary, to cycle through the three favorite channels.

The LCD screen displays CH1, CH2, or CH3 as appropriate, to show which favorite channel is operational.

When you are finished using a favorite channel, press **<ESC** to return to previous working channel.

Delete a favorite channel

Press **3CH** to display the first favorite channel. Repeat the procedure, if necessary, until the favorite channel that you want to delete is displayed.

With the favorite channel displayed, hold down **3CH** for about two seconds until the radio asks: *DELETE CHxx?*

If you press **>ENT** to confirm, the channel is deleted from your favorite channel selection.

Select a weather channel

This option is only available with the USA or Canadian channel banks.

Press **WX** to tune to the most recently used weather channel. WX is displayed on the LCD screen.

Press **^CH/SELv** to tune to a different weather channel, if desired.

If a weather alert is transmitted on 1050Hz by a weather station, the radio picks it up automatically and sounds the loud weather alert warning tone.

Press any key while the loud alarm is sounding to cancel the warning tone and listen to the weather alert voice message.

When you are finished using the weather channel, press **WX** again to return to previous working channel.

Dual/Tri watch scan

You can use the radio setup menu to select DUAL or a TRI watch mode. (See *Reference Section 1 - Select dual or triple watch mode.*)

Dual watch mode will automatically scan between the working channel and CH16 (the priority channel).

When you are on a working channel, just press **SCAN** to start scanning. DUAL WATCH is shown on the LCD screen.

If the USA or CAN channel banks are selected, and you have set the weather alert facility to

ON, the weather channel is also scanned.

If a signal is received, scanning stops at that channel and BUSY appears on the LCD screen. Scanning starts again four seconds after the BUSY annunciator disappears.

To stop at the current channel and cancel the scan mode, press **SCAN** again or **<ESC**.

All scan and channel lock out

While scanning, USA radio models will shadow watch on CH70 for incoming DSC calls.

When you are on a working channel, hold down **SCAN** for at least two seconds to start scanning all working channels. CH16 (the priority channel) is scanned once every two seconds. ALL SCAN is shown on the LCD screen.

Press **<ENT** to lock out (skip over) an 'always busy' channel when in ALL SCAN mode. An X is shown on the LCD screen to indicate a locked out channel. You cannot lock out CH16 or CH70.

To unlock a locked out channel, press **<ENT** when the channel is displayed. The X disappears to show it is now unlocked.

If a signal is received, scanning stops at that channel and BUSY appears on the LCD screen. Scanning starts again four seconds after the BUSY annunciator disappears.

To stop at the current channel and cancel the SCAN mode, press **SCAN** again or **<ESC**.

Shadow watch scan

The USA radio models use shadow watch mode to scan for incoming DSC signals on CH70 in any channel bank (USA, CAN, INT).

Shadow watch mode means that the scanning operation is not shown on the LCD screen

unless a DSC signal on CH70 is detected.

The European radio models have a dedicated DSC CH70 receiver and don't use shadow watch mode.

Use the foghorn

When visibility is reduced by fog, you can operate a manual or automatic foghorn through the external speaker. The *manual* foghorn will sound whenever you press or hold down **PTT**. The *automatic* foghorn will sound for five seconds once every minute.

You can also adjust the foghorn volume or leave it at the default level.

1. Press **FUNC** then **9** to enter fog mode. FO is shown on the LCD screen.
2. Press **>ENT** to select the automatic foghorn
OR
move the cursor to **MANUAL** and then press

>ENT to select the manual foghorn.

4. When the foghorn is blowing you can press **^VOL** to increase or **VOLv** to decrease the foghorn volume. The LCD screen will show the current foghorn volume as a percentage e.g. **50% VOLUME**.
5. The foghorn's listening function allows sounds picked up by the hailer horn to be heard over the radio. When the LCD screen shows LISTENING, you can press **^VOL** to increase or **VOLv** to decrease the volume.

Press **<ESC** when you want to exit from the foghorn mode.

Use the intercom on the NS100 DS

PORT OPS
N 38 27.021'
E137 12.011'
T 12:27 UTC

FUNC>WAITING
N 38 27.021'
E137 12.011'
T 12:27 UTC

INTERCOM
CALLING
STATION-2

INTERCOM
TALKING

IMPORTANT!

Normal radio operation is suspended when you are using the intercom, but an incoming DSC signal will interrupt the intercom facility and you must attend to the DSC signal before using the intercom again.

The dual handsets on the NS100 DS radio provide a useful intercom facility.

When you lift a handset out from its customised bracket, an inbuilt sensor automatically makes the handset operational.

1. Press **FUNC** then **6** on your handset (handset-1) to enter the intercom mode. The radio calls handset-2 for one minute.
2. Handset-2 beeps and the LCD screen shows a message to indicate that you (handset-1) are calling.

3. If the person at handset-2 wants to enter intercom mode and reply, they need to pick up handset-2 and press **6**, then press **PTT** to talk.

You can use the intercom for a maximum of five minutes, and you can adjust the intercom volume during the listening mode with **^VOL** and **VOLv**.

4. When you are finished with the intercom mode, just press **<ESC** to return to normal radio operation. Always be sure to replace your handset back in its customised bracket.

Use the hailer on the NS100 DS

PORT OPS
N 38 27.021'
E137 12.011'
T 12:27 UTC

FUNC>WAITING
N 38 27.021'
E137 12.011'
T 12:27 UTC

HAILER MODE
LISTENING
VOLUME 30%

HAILER MODE
HAILING
VOLUME 30%

The NS100 DS radio has a useful hailing facility with ten volume settings. To use the hailer:

1. Press **FUNC** then **4** to activate the hailer. The LCD screen shows HL to confirm that hailer mode is operating and also shows the hailer volume as a percentage.
2. Press **PTT** to send a hail. Speak at a normal volume into the handset microphone, and use the **^VOLv** buttons if you need to increase or decrease the volume.

The hailer horn has a listening function which allows sounds picked up by the hailer horn to be heard over the radio. To change the volume, use the **^VOLv** buttons when LISTENING is shown on the LCD screen.

You can use the hailer for a maximum of 30 minutes.

3. When you are finished using the hailer, just press **<ESC** to return to normal radio operation.

Handset alarm for the NS100 DS

If you forget to put one of the handsets back into its customised bracket (ON HOOK mode) when you are finished using it, the handset sounds an alarm after one hour and a message on the LCD screen warns you to put the handset into its customised bracket.

Hold down **>ENT** for five seconds to regain operational control of the handset.

Use the dual handsets on the NS100 DS

The internal handset speaker is disabled when the handset is in its customised bracket.

When handset-2 is in its customized bracket (in ON HOOK mode), you can use handset-1 for any radio operation.

Handset-2 can be used only for distress calls and the intercom function when it is in ON HOOK mode.

Reference Section 1

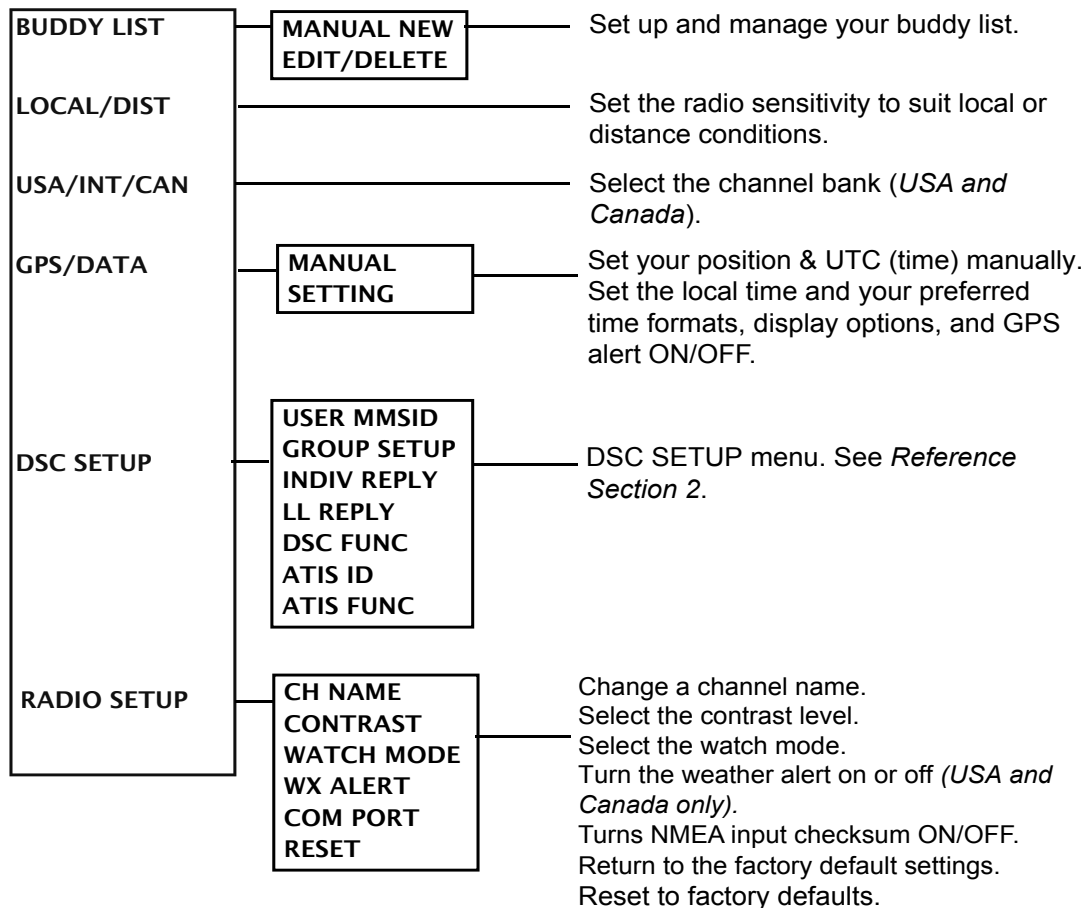
Radio Menu Options

NS100 radio menu.....
Add a new buddy.....
Edit a buddy's details.....
Delete a buddy's details.....
Set the radio sensitivity.....
Select the channel bank.....
Set your position and time manually.....
Set the time offset.....
Select the time format.....
Show or hide the time.....
Show or hide the boat's position.....
GPS alert setting.....
Edit or delete a channel name.....
Set the contrast.....
Select dual or triple watch.....
Weather alert setting.....
Com port setting.....
Reset to factory defaults.....

This reference section explains how to display and use the radio menu options to customise your NS100 radio. Note that some options may not be available, depending on your radio model and location.

NS100 radio menu

Press **FUNC** then **1** to display the radio menu. Note that only four menu items can be shown on the LCD screen at any one time so use **^CH/SEL** to scroll up and **CH/SELv** to scroll down the radio menu. Press **>ENT** to select an option.



Add a new buddy

```
>BUDDY LIST  
LOCAL/DIST  
USA/INT/CAN  
GPS/DATA
```

```
BUDDY LIST  
>MANUAL NEW  
EDIT/DELETE
```

```
ENTER NAME  
-----  
ENTER MMSID  
-----
```

```
ENTER NAME  
JON  
ENTER MMSID  
123456789
```

```
JON  
123456789  
ENT>STORE  
ESC>CANCEL
```

You can use the Buddy List option to store, edit, or delete the names and associated MMSIDs of your 20 favorite buddies. Their details are stored in the order of entry, with the most recent entry shown first.

1. Select **BUDDY LIST** and press **>ENT**. The cursor is at **MANUAL NEW**. Press **>ENT**.
2. Enter your buddy's name, one character at a time (this may be alphanumeric) then press **>ENT** repeatedly until the cursor moves to the MMSID entry line.

3. Enter the MMSID associated with that buddy's name (this *must* be numeric) then press **>ENT** to confirm a correct entry.
4. The new name and MMSID are displayed. Press **>ENT** to store the new entry which is displayed at the top of your buddy list.

When your BUDDY LIST is full up with 20 entries, you cannot make another new entry until you have deleted an existing entry.

Edit a buddy's details

```
>BUDDY LIST  
LOCAL/DIST  
USA/INT/CAN  
GPS/DATA
```

```
BUDDY LIST  
MANUAL NEW  
>EDIT/DELETE
```

```
JON  
>EDIT  
DELETE
```

```
EDIT NAME  
JON  
EDIT MMSID  
112233445
```

```
JON  
111223344  
ENT>STORE  
ESC>CANCEL
```

1. Select **BUDDY LIST** and press **>ENT**. Move the cursor to **EDIT/DELETE**. Press **>ENT** to display the list of entries.
2. Scroll down (if required) to the incorrect entry and press **>ENT**.
3. Press **>ENT** to select **EDIT**. The cursor moves to the first character of the name.
4. Edit the buddy name, OR, to edit only the MMSID, press **>ENT** repeatedly to move the cursor to the MMSID line.
5. When you are finished, press **>ENT** (repeatedly if necessary) to display the next screen.
6. Press **>ENT** to store the changes. The buddy list is displayed again. If more changes are required, repeat Steps 2 thru 6. Otherwise, press **<ESC** to exit.

Delete a buddy's details

>BUDDY LIST
LOCAL/DIST
USA/INT/CAN
GPS/DATA

BUDDY LIST
MANUAL NEW
>EDIT/DELETE

BUDDY LIST
ALEX
>TOM
JEAN

TOM
EDIT
>DELETE

DELETE BUDDY
TOM
ENT>YES
ESC>NO

1. Select **BUDDY LIST** and press **>ENT**.
2. Move the cursor to **EDIT/DELETE**. Press **>ENT** to display the list of entries.
3. Scroll down (if required) to the entry you want to delete and press **>ENT**.
4. Move the cursor to **DELETE** and press **>ENT**.
5. The radio asks for confirmation. Press **>ENT**.
The entry is deleted immediately and the buddy list is displayed again.

Set the radio sensitivity

BUDDY LIST
>LOCAL/DIST
USA/INT/CAN
GPS/DATA

SENSITIVITY
>DIST
LOCAL

You can improve the sensitivity of the receiver depending whether you are operating the radio 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 or pager broadcast sites.

Also see the *Quickstart Guide - Adjust the squelch* as the squelch setting can alter the radio sensitivity.

1. Move the cursor to **LOCAL/DIST** and press **>ENT**.
2. To activate the DIST setting, press **>ENT** again. LOC disappears from the LCD screen to show that reduced receiver sensitivity is

not operational

OR

to activate the LOCAL setting, move the cursor to **LOCAL** and press **>ENT**. LOC appears on the LCD screen to show that reduced receiver sensitivity is operational.

Select the channel bank

BUDDY LIST
LOCAL/DIS
>USA/INT/CAN
GPS/DATA

CH SELECT
>USA
INT
CAN

This option is not available in Europe because the channel bank is preset to INT (international).

In the USA and Canada, a choice of 3 channel banks is available;

- USA
- INT (International)
- CAN (Canadian).

Appendix C shows the channel bank details.

1. Move the cursor to **USA/INT/CAN** and press **>ENT**.

2. Press **>ENT** again to select the USA channel bank

OR

move the cursor to **INT** or **CAN** and then press **>ENT**.

Depending on your selection, USA, INT or CAN will be shown on the LCD screen.

Set your position and time manually

BUDDY LIST
LOCAL/DIS
USA/INT/CAN
>GPS/DATA

GPS/DATA
>MANUAL
SETTING

MANUAL LL
N ---:---
E ---:---
MAN ---:---UTC

If your boat has an operational GPS navigation receiver, the 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 your boat's position and the local time manually, using the GPS/DATA menu option. This information is important because it will be used if you transmit a DSC DISTRESS call.

1. Move the cursor to **GPS/DATA** and press **>ENT**.
2. Move the cursor to **MANUAL** and press **>ENT**.

4. Enter your latitude and press **>ENT**. Enter your longitude and press **>ENT**.
5. Enter your local time in UTC format; e.g. if the local time is 1715 and you are 3.5 hours behind UTC, enter the time as 2045. A world time chart is shown for your information.
6. Press **>ENT** when all the information is correct.

The vessel's latitude and longitude are shown on the LCD screen, with the UTC time. The prefix **MAN** indicates a manual entry.

If a real GPS position is received, your manual entries are cancelled and MAN disappears off the LCD screen.

Set the time offset

BUDDY LIST
LOCAL/DIS
USA/INT/CAN
>GPS/DATA

GPS/DATA
MANUAL
>SETTING

GPS/DATA
>TIME OFFSET
TIME FORMAT
TIME DISPLAY

TIME OFFSET
>+00:00
00:00 UTC

TIME OFFSET
>+1.30
01:30 UTC

TIME OFFSET
>+1.30
01:30 LOC

1. Move the cursor to **GPS/DATA** and press **>ENT**.
3. Move the cursor to **SETTING** and press **>ENT**.
4. Press **>ENT** again. The time offset is shown as +00:00.
5. Work out the offset between your local time and UTC using the world time chart if necessary; e.g. if you are 1.5 hours ahead of UTC, enter an offset of +01:30 hours.
6. Enter your local offset from UTC and press **>ENT** to confirm. The offset is shown with a suffix **LOC** to indicate your local offset.

INSERT WORLD PICTURE SHOWING TIME ZONES OFFSET FROM UTC/GMT.

Select the time format

BUDDY LIST LOCAL/DIS USA/INT/CAN >GPS/DATA	GPS/DATA MANUAL >SETTING	GPS/DATA TIME OFFSET >TIME FORMAT TIME DISPLAY	TIME FORMAT >12 HOUR 24 HOUR 23:30 LOC	PORT OPS N 35'.43.211' E123'45.113' 11.30PM LOC
---	--------------------------------	---	---	--

1. Move the cursor to **GPS/DATA** and press **>ENT**.
2. Move the cursor to **SETTING** and press **>ENT**.
3. Move the cursor to **TIME FORMAT** and press **>ENT**. There is a choice of a 12 hour time format that uses AM and PM suffixes, or a 24 hour time format.
4. Press **>ENT** again to select the 12 hour time

format

OR

move the cursor to **24 HR** and then press **>ENT** to select the 24 hour time format.

The new time format is displayed immediately.

Show or hide the time

BUDDY LIST LOCAL/DIS USA/INT/CAN >GPS/DATA	GPS/DATA MANUAL >SETTING	GPS/DATA TIME OFFSET TIME FORMAT >TIME DISPLAY	TIME DISPLAY ENT>ON ESC>OFF
---	--------------------------------	---	-----------------------------------

If you have entered the time manually (see *Reference Section 1 - Set your position and time manually*), the time is always shown on the screen with the prefix MAN.

However, if the time is being updated through a GPS navigation receiver, you can show or hide the time on the LCD screen.

1. Move the cursor to **GPS/DATA** and press **>ENT**.
2. Move the cursor to **SETTING** and press **>ENT**.
3. Move the cursor to **TIME DISPLAY** and press

>ENT again.

4. Press **>ENT** again to have the LCD screen show the time

OR

press **<ESC** to hide the time.

Show or hide the boat's position

BUDDY LIST
LOCAL/DIS
USA/INT/CAN
>GPS/DATA

GPS/DATA
MANUAL
>SETTING

GPS/DATA
TIME FORMAT
TIME DISPLAY
>LL POSITION

LL POSITION
ENT>ON
ESC>OFF

If you have entered the boat's position manually (see *Reference Section 1 - Set your position and time manually*), the position is always shown on the screen with the prefix **MAN**.

However, if the boat's position is being updated through a GPS navigation receiver, you can show or hide the boat's position on the LCD screen.

1. Move the cursor to **GPS/DATA** and press **>ENT**.
2. Move the cursor to **SETTING** and press **>ENT**.

3. Scroll through the GPS/DATA menu to **LL POSITION** and press **>ENT** again.
 4. Press **>ENT** again to have the LCD screen show the boat's position
- OR
- press **<ESC** if you want to hide the boat's position.

GPS alert setting

BUDDY LIST
LOCAL/DIS
USA/INT/CAN
>GPS/DATA

GPS/DATA
MANUAL
>SETTING

GPS/DATA
TIME DISPLAY
LL POSITION
>GPS ALERT

GPS ALERT
ENT>ON
ESC>OFF

The GPS alert is usually set to ON so that if the GPS navigation receiver is disconnected, warning alarm beeps sound.

1. Move the cursor to **GPS/DATA** and press **>ENT**.
2. Move the cursor to **SETTING** and press **>ENT**.
3. Scroll through the GPS/DATA menu to **GPS ALERT** and press **>ENT** again.

4. Press **>ENT** again to have the GPS alert ON
- OR
- press **<ESC** to turn it off.

If the GPS alert is turned off, the GPS symbol disappears off the LCD screen.

Edit or delete a channel name

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
>CH NAME
CONTRAST
WATCH MODE

CH NAME
>TELEPHONE

TELEPHONE
>EDIT
DELETE

EDIT CH NAME
TELEPHONE

EDIT CH NAME
PHONE AAAA
ENT>YES
ESC>NO

The channel banks are listed in Appendix C with their default names. You can edit the individual channel names or delete them.

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press **>ENT**.
3. Press **>ENT** again to select CH NAME.
4. Use **^CH/SELv** to select the channel and display the associated name tag, then press **>ENT**.

The LCD screen shows the existing channel name and invites you to edit or delete it.

5. Press **>ENT** to edit the channel name and then enter the new name over the existing name. It can be a maximum of 12 characters. (In this example, TELEPHONE is changed to PHONE AAAA.)

OR

move the cursor to **DELETE** and then press **>ENT** to delete the existing name. In this case, no name will be displayed on the LCD screen when the channel is operational.

6. Press **>ENT** again to confirm the new channel name or deletion.

Set the contrast

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
CH NAME
>CONTRAST
WATCH MODE

CONTRAST
LO HI
■■■■

You can adjust the contrast on the LCD screen to suit your own preference. There is a choice of 16 contrast levels.

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press **>ENT**.
3. Move the cursor to **CONTRAST** and press

>ENT.

4. Use **^CH/SEL** or **CH/SELv** to increase or decrease the contrast to the desired level.

The lowest contrast levels 1 thru 3 are all shown by one bar only on the LCD screen. The highest contrast levels 14 thru 16 are all shown by 12 bars on the LCD screen. The example here indicates contrast level 6.

Select dual or triple watch mode

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
CH NAME
CONTRAST
>WATCH MODE

WATCH MODE
>ONLY 16CH
16CH + 9CH

Dual watch mode automatically scans between the priority channel and the working channel. CH16 is the default priority channel.

Triple watch mode is available only with the USA radio model. It automatically scans between the two priority channels, CH16 and CH09, and the working channel.

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press

>ENT.

3. Move the cursor to **WATCH MODE** and press **>ENT**.
4. To set a dual watch mode that scans CH16 as the priority channel, press **>ENT** again
OR

to set a triple watch mode that scans both the priority channels, move the cursor to **16CH + 9CH** and then press **>ENT**.

Weather alert setting

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
CONTRAST
WATCH MODE
>WX ALERT

WX ALERT
ENT>ON
ESC>OFF

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

If you are operating on the USA or Canadian channel banks, you can set the radio to pick up any weather alerts as follows:

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press

>ENT.

3. Move the cursor to **WX ALERT** and press **>ENT**.
4. If you want to select the weather alert facility, press **>ENT** again so that when a weather alert is broadcast, the alert will sound. (Press any button to hear the weather alert voice message).

Press **<ESC** to cancel the weather alert facility.

Com port setting

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
WATCH MODE
WX ALERT
>COM PORT

CHECKSUM
ENT>ON
ESC>OFF

If you have a group of boat instruments that communicate with each other using NMEA protocol, you can add the radio to the group.

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press **>ENT**.

3. Move the cursor to **COM PORT** then press **>ENT**.
4. Press **>ENT** again to select CHECKSUM ON and have the radio communicate with the other instruments through NMEA protocol.

Some older instruments may need CHECKSUM to be set OFF, so they can access GPS data.

Reset to factory defaults

USA/INT/CAN
GPS/DATA
DSC SETUP
>RADIO SETUP

RADIO SETUP
WX ALERT
COM PORT
>RESET

RESET RADIO
ARE YOU SURE
ENT>YES
ESC>NO

You can reset the radio back to the following factory defaults:

Time offset: 00.00
Time format: 24 hour clock
Time display: On
LL display: On
GPS alert: Off (USA), On (Europe)
Individual reply: Manual
LL reply: Manual
WX alert: On
Contrast: 8
Priority channel: CH16
Watch mode: CH16

Your buddy list and group list are *not* deleted when you reset the radio.

1. Scroll through the radio menu until **RADIO SETUP** is displayed.
2. Move the cursor to **RADIO SETUP** and press **>ENT**.
3. Scroll through the RADIO SETUP menu until the cursor is next to **RESET** then press **>ENT**.
4. The radio asks you to reconfirm that you really want to reset to the factory defaults. Press **>ENT** to reset the radio

OR

press **<ESC** to keep all your preferences.

Reference Section 2

Setup the DSC functions

What is DSC?.....	
The DSC setup menu.....	
Enter your MMSID.....	
Enter a new group MMSID.....	
Edit a group MMSID.....	
Delete a group MMSID.....	
Select your response to individual calls.....	
Select your response to LL polling calls.....	
Turn the DSC functions on/off.....	
Enter your ATIS ID.....	
Turn the ATIS functions on/off.....	

This reference section explains how to set up the DSC (Digital Selective Calling) functions on your radio. Some options may not be available, depending on your radio model and location.

What is DSC?

IMPORTANT!

You must enter your MMSID to access the DSC functions.

DSC (Digital Selective Calling) is a VHF radio transmission system that can transmit digital signals. DSC capability enables you to use the Global Maritime Distress Signalling System (GMDSS) to transmit a coded distress signal using the DISTRESS button.

Any DSC radio within range of the distress signal will *automatically* register the distress signal and

display the details on the LCD screen.

Every DSC user has a unique identifier called an MMSID. You *must* enter your MMSID into the radio so that you can access the DSC functionality.

If you don't have an MMSID, contact the appropriate authorities in your country. If you don't know who to contact, ask your dealer.

The DSC setup menu

1. Press **FUNC** then **1** to enter the radio menu. Note that only four menu items can be shown on the LCD screen at any one time so use **^CH/SEL** to scroll up and **CH/SELv** to scroll down the menu.
2. Scroll through the main menu until the cursor is next to the **DSC SETUP** option, then press **>ENT**. The DSC setup menu is displayed.

USER MMSID	— Enter your user MMSID.
GROUP SETUP	— Enter or change the name and/or details of a group MMSID.
INDV REPLY	— Choose an automatic or manual response to calls (<i>USA and Canada only</i>).
LL REPLY	— Select your response to an LL polling request.
DSC FUNC	— Turn the DSC functionality ON/OFF (USA). In Europe, if DSC functionality is OFF, ATIS functionality is ON.
ATIS ID	— Enter or change your ATIS MMSID (<i>Europe only</i>).
ATIS FUNC	— Enable/disable the ATIS function (<i>Europe only</i>).

Enter your MMSID

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
>USER MMSID
GROUP SETUP
INDV REPLY

INPUT USER
MMSID_____

187654321
MMSID
ENT>STORE
ESC>CANCEL

USER MMSID
INPUT AGAIN

187654321
MMSID
ENT>STORE
ESC>CANCEL

WARNING!

This is once-only operation. You can display and read your MMSID at any time, but you get only *one* opportunity to store your MMSID in the radio. You cannot change it after you have stored it.

1. Select **DSC SETUP** and press **>ENT**.

2. Press **>ENT** again to select the **USER MMSID** option.

3. If this is the *first time* that you are entering your MMSID, a dashed line appears.

Enter your nine-digit MMSID along the dashed line. The cursor automatically moves to the next space after you enter each digit.

If you make an error, press **<ESC** to clear all the numbers you've entered so far, and return to the DSC SETUP menu so that you can start again.

4. When you have entered your MMSID correctly, press **>ENT**.

5. You must reenter your MMSID again as a check, then press **>ENT** again to permanently store your MMSID and return to the menu.

You can view your stored MMSID at anytime by selecting USER MMSID in the main menu.

Enter a new group MMSID

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
USER MMSID
>GROUP SETUP
INDV REPLY

GROUP SETUP
>MANUAL NEW
GROUP 1
GROUP 2

GROUP NAME

GROUP MMSID
0_____

ENTER NAME
FISHING
ENTER MMSID
0_____

ENTER NAME
FISHING
ENTER MMSID
023456789

FISHING
023456789
ENT>STORE
ESC>CANCEL

If you call the same group of people frequently, you can store their details in a group MMSID. Then, when you call that group MMSID, every person in the group receives your call automatically.

You can store a maximum of five group MMSIDs.

A group MMSID always starts with 0.

1. Select **DSC SETUP** and press **>ENT**.

2. Move the cursor to **GROUP SETUP** then press **>ENT**.

3. Press **>ENT** again to select **MANUAL NEW**. If this is the *first time* that you are entering a group name OR if an unused group MMSID is

available, a dashed line appears. (Otherwise, the existing group names are displayed for you to edit or delete.)

4. Enter the group name along the dashed line. In this example the group name is FISHING. The group name can contain a maximum of 11 alphanumeric characters.

The cursor automatically moves to the next space after you enter each digit. If you make an error, press **<ESC** to backup and correct the entry.

When you have finished, press **>ENT** (repeatedly if necessary) until the cursor moves to the MMSID line.

5. Enter the group MMSID. Remember that the first number is always 0. The cursor automatically moves to the next space after you enter each digit. If you make an error, press **<ESC** to backup and correct the entry.

When you are finished, press **>ENT**.

6. The group name and group MMSID are shown in a confirmation screen. Press **>ENT** to store the details and return to the GROUP SETUP option.

Edit a group MMSID

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
USER MMSID
>GROUP SETUP
INDV REPLY

GROUP SETUP
FISHING
>WATERSKIERS
RACERS

WATERSKIERS
067890123
>EDIT
DELETE

EDIT NAME
WATERSKIERS
EDIT MMSID
067890123

WATERSKIERS
067890123
ENT>STORE
ESC>CANCEL

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **GROUP SETUP** then press **>ENT**. The existing group MMSID names are listed.
3. Move the cursor to the group MMSID name that you want to edit, then press **>ENT**.
4. The group name and group MMSID are listed, with the cursor at the first character of the group name. Edit the group name, if required, or press **>ENT** repeatedly to move the cursor to the group MMSID. Make any changes to the group MMSID number, if required.

5. When you are finished, press **>ENT** to confirm the changes and return to the GROUP SETUP option.

Delete a group MMSID

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
USER MMSID
>GROUP SETUP
INDV REPLY

GROUP SETUP
MANUAL NEW
FISHING
>WATERSKIERS

WATERSKIERS
EDIT
>DELETE

DELETE GROUP
WATERSKIERS
ENT>YES
ESC>NO

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **GROUP SETUP** then press **>ENT**. The existing group MMSID names are listed.
3. Move the cursor to the group MMSID name that you want to delete, then press **>ENT**.
4. The group name is shown. Move the cursor to **DELETE** and press **>ENT**.
5. Press **>ENT** again to confirm the deletion or **<ESC** to cancel the deletion and return to the GROUP SETUP option, .

Select your response to individual calls

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
USER MMSID
GROUP SETUP
>INDV REPLY

INDV REPLY
ENT>AUTO
ESC>MANUAL

European radio models
require a manual
acknowledgement.

If you are operating on the USA or Canadian channel banks, you can choose to respond to incoming individual calls with an automatic or 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** and press **>ENT**.
2. Move the cursor to **INDV REPLY** and press **>ENT**.

3. Press **>ENT** again if you want to select **AUTO** for an automatic response,
OR
press **<ESC** for a manual response.

Select your response to LL polling calls

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
GROUP SETUP
INDV REPLY
>LL REPLY

LL REPLY
>AUTO
MANUAL
OFF

Another boat may send an LL polling request to ask for your boat's position. You can choose to respond to an LL polling request in one of three ways:

- **AUTO** will automatically send your boat's position in response to any incoming LL polling requests from your buddies.
- **MANUAL** means that you choose whether or not to reply to any incoming LL polling requests.
- **OFF** ignores all LL polling requests.

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **LL REPLY** and press **>ENT**.
3. Select your response, then press **>ENT** again to return to the DSC SETUP option.

Turn the DSC functions on/off

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
INDV REPLY
LL REPLY
>DSC FUNC

DSC FUNC
ENT>ON
ESC>OFF

■ WARNING!

You can turn OFF the DSC functions, but this is *not* recommended because you won't be able to automatically transmit coded information about your boat to the GMDSS in a distress situation.

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **DSC FUNC** and press **>ENT**.
3. Press **>ENT** again if you want to turn the DSC functions ON,

OR

press **<ESC** to turn the DSC functions OFF.

It is not possible to have both of DSC and ATIS operating simultaneously. When you turn one

ON, the other will turn OFF. If they are both OFF, you must set DSC FUNC to ON to get DSC functionality.

Enter your ATIS ID

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
LL REPLY
DSC FUNC
>ATIS ID

INPUT USER
ATIS ID
9_____

987654321
ATIS ID
ENT>STORE
ESC>CANCEL

USERATISID
INPUT AGAIN

987654321
ATIS ID
ENT>STORE
ESC>CANCEL

■ WARNING!

This is a once-only operation. You can display and read your ATIS ID at any time, but you only get *one* opportunity to store it in the radio. You cannot change it after you have stored it.

If you are navigating inland waterways within Europe, you must enter your ATIS ID to access ATIS functionality. ATIS will send a digital signal anytime you release the PTT key.

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **ATIS ID** and press **>ENT**. If this is the *first time* that you are entering your ATIS ID, a dashed line appears with **9** shown as the first number. Note that an ATIS ID *always* starts with 9.
3. Enter the rest of your ATIS ID numbers along the dashed line. The cursor automatically moves to the next space after you enter each

number.

If you make an error, press **<ESC** to clear all the numbers you have entered so far and return to the DSC SETUP menu, so that you can start again.

4. When you have entered your ATIS ID correctly, press **>ENT**.
5. You must reenter your ATIS ID again as a check, then press **>ENT** again to permanently store your ATIS ID in the radio.

You can view your ATIS ID any time by selecting ATIS ID in the DSC SETUP menu.

Turn the ATIS functions on/off

LOCAL/DIST
USA/INT/CAN
GPS/DATA
>DSC SETUP

DSC SETUP
DSC FUNC
ATIS ID
>ATIS FUNC

ATIS FUNC
ENT>ON
ESC>OFF

Inland waterways rules require 1W Tx power on channels 06, 08, 10, 11, 12, 13, 14, 15, 17, 71, 72, 74, and 77.

1. Select **DSC SETUP** and press **>ENT**.
2. Move the cursor to **ATIS FUNC** and press **>ENT**.
3. Press **>ENT** again if you want to turn the ATIS functions ON and the ATIS symbol will appear on the LCD screen to confirm that your vessel has ATIS functionality,

OR

press **<ESC** to turn ATIS functionality OFF.

NOTE: It is not possible to have ATIS and DSC operating simultaneously. When you turn one ON, the other will turn OFF. If they are both off, you must turn on DSC to get DSC functionality.

Reference Section 3

Making DSC calls

- The DSC call menu.....
- Reply to the last incoming call.....
- Make a routine call to an individual.....
- Make a routine call to a group.....
- Retry a routine call.....
- Call all ships.....
- Call back using the call log data.....
- Request the LL position of a buddy.....

IMPORTANT!

You must have stored a valid user MMSID into your NS100 radio in order to access these DSC functions.

This reference section explains how to access the DSC call menu options and how to make different types of DSC calls.

The DSC call menu

Press **CALL** to display the first three options of the DSC call menu. Note that only three options can be shown on the LCD screen at any one time, so use **^CH/SEL** to scroll up and **CH/SELv** and down the DSC call menu. Press **>ENT** to select an option.

LAST CALL	— Display details of the most recent incoming call and reply.
INDIVIDUAL	— Make a routine call to another individual or to a buddy.
GROUP	— Make a routine call to any one of the five groups that you have (optionally) set up.
ALL SHIPS	— Make a call to all ships.
CALL LOG	— Show details of the most recent 20 incoming calls.
DISTRES LOG	— Two DISTRESS logs show the details of the ten most recent distress calls and the ten most recent distress relays.
LL REQUEST	— Request the LL position of a buddy.

Reply to the last incoming call

DSC CALL
>LAST CALL
INDIVIDUAL
GROUP

787878787
INDIVIDUAL
ROUTINE
>SET CHANNEL

787878787
INDIVIDUAL
ROUTINE
>SEND?

787878787
INDIVIDUAL
ROUTINE
CALLING...

PORT OPS/VTs
787878787
INDIVIDUAL
WAITING ACK

INDV ACK
787878787
PRESS PTT
ESC->EXIT

The person you are calling must also have a radio with DSC functionality.

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Press **>ENT** to have the radio display the MMSID and other details about the most recent incoming call.
3. If you want to reply, press **>ENT** to select the working channel. Otherwise, press **<ESC**. (Note: you cannot usually call a duplex channel so these are automatically eliminated. If the call is to a Coast Station the radio will recognize this and select the correct frequency.)
4. The call details are summarized on the LCD screen. Press **>ENT** to send the call. The radio checks the status of CH70 and if it is busy, waits for 2 seconds before rechecking.

When CH70 is free, the call is sent and the TX symbol appears on the LCD screen.
5. If the call is acknowledged, press **PTT** to talk on the working channel.

If there is no reply, try making the call again. (See *Reference Section 3 - Retry a routine call.*)

Make a routine call to an individual

DSC CALL
LAST CALL
>INDIVIDUAL
GROUP

INDIVIDUAL
>MANUAL NEW
JON
BILL

MANUAL MMSID

345634563
INDIVIDUAL
ROUTINE
>SET CHANNEL

345634563
INDIVIDUAL
ROUTINE
ENT>SEND?

345634563
INDIVIDUAL
ROUTINE
CALLING...

345634563
INDIVIDUAL
ROUTINE
WAITING ACK

The person you are calling must also have a radio with DSC functionality.

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Move the cursor to **INDIVIDUAL** then press **>ENT**. You can send a call to one of your buddies or to another individual.
3. To call a buddy, scroll through your buddy list, select the name and then press **>ENT**.
4. Select the working channel and press **>ENT**. (You cannot usually call a duplex channel so these are automatically eliminated. If the call

To call an individual that is *not* in your buddy list, press **>ENT** to select **MANUAL NEW**. You must enter the individual's MMSID and then press **>ENT**. (If you enter a wrong digit, press **<ESC** to erase it.)

is to a Coast Station the radio will recognize this and select the correct frequency.)

5. The call details are summarized on the LCD screen. Press **>ENT** to send the call. The radio checks the status of CH70 and if it is busy, waits for two seconds before rechecking.

When CH70 is free, the call is sent and the

TX symbol appears on the LCD screen.

6. If the call is acknowledged, press **PTT** to talk on the working channel.

If there is no reply, try making the call again.
(See *Reference Section 3 - Retry a routine call.*)

Make a routine call to a group

DSC CALL
LAST CALL
INDIVIDUAL
>GROUP

SELECT GROUP
>FISHING
WATERSKIERS
RACING

FISHING
05555555
ROUTINE
>SET CHANNEL

FISHING
05555555
ROUTINE
ENT>SEND?

FISHING
05555555
ROUTINE
CALLING...

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Move the cursor to **GROUP** then press **>ENT**. You can send a call to any one of the groups that you have set up (see *Reference Section 2 - Enter a new group MMSID.*)
3. Select the group that you want to call and then press **>ENT**.
4. The group name and MMSID are displayed. Select the working channel and press **>ENT**. (You cannot usually call a duplex channel so these are automatically eliminated. If the call is to a Coast Station the radio will recognize this and select the correct frequency.)
5. The call details are summarized on the LCD screen. Press **>ENT** to send the call. The radio checks the status of CH70 and if it is

busy, waits for two seconds before rechecking. When CH70 is free, the call is sent and the TX symbol appears on the LCD screen.

6. If the call is acknowledged, press **PTT** to talk on your selected working channel. If there is no reply, try making the call again. (See *Reference Section 3 - Retry a routine call.*)

Retry a routine call

PORT OPS/VTS
787878787
INDIVIDUAL
WAITING ACK

787878787
SEND AGAIN?
ENT>YES
ESC>NO

787878787
INDIVIDUAL
ROUTINE
CALLING...

PORT OPS/VTS
787878787
INDIVIDUAL
WAITING ACK

INDV ACK
787878787
PRESS PTT
ESC->EXIT

1. If there is no acknowledgement to your call after waiting for two minutes, the radio asks if you want to retry sending the call. Press **>ENT** to retry.
2. The radio checks the status of CH70 and if it is busy, waits for two seconds before rechecking.

When CH70 is free, the call is sent again and

the TX symbol appears on the LCD screen.

3. The radio will repeat this cycle twice. If the call remains unacknowledged after three minutes at the last attempt, the radio returns to normal working channel mode.
4. If the call is acknowledged, press PTT to talk on the working channel.

Call all ships

DSC CALL
INDIVIDUAL
GROUP
>ALL SHIPS

ALL SHIPS
>URGENCY
SAFETY
ROUTINE

ALL SHIPS
URGENCY
ENT>SEND
ESC>CANCEL

ALL SHIPS
URGENCY
CALLING...

DISTRESS
N 38 27.021'
E137 12.011'
T 12:27 UTC

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Scroll through the options and move the cursor to **ALL SHIPS**. Press **>ENT**. You have a choice of different priority levels:
 - **URGENCY** for use in a serious situation or problem that could lead to a distress situation.
 - **SAFETY** to send safety information to all other vessels in range.
 - **ROUTINE** for a routine call at 1W transmission power (*USA/Canada only*).
3. Press **>ENT** to select **URGENCY**, or scroll to

a different priority level and then press **>ENT**.

4. The radio displays a summary and asks for confirmation. Press **>ENT** to make the call or **<ESC** to cancel.
5. The radio checks the status of CH70 and if it is busy, waits for two seconds before rechecking. The radio will repeat this cycle twice and then return to normal working channel mode.

When CH70 is free, the call is sent and the TX symbol appears on the LCD screen. The working channel moves to CH16 to wait for a voice contact.

Call back using the call log data

DSC CALL
GROUP
ALL SHIPS
>CALL LOG

01 NS100
INDIVIDUAL
ROUTINE
10:45PM LOC

NS100
>CALL BACK
DELETE
SAVE

You can use the call log to quickly display details about the 20 most recent incoming calls, so that you can call any of them back. You can also save an entry in your buddy list, or delete an entry.

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Scroll through the options and move the cursor to **CALL LOG**. Press **>ENT**. The details of most recent incoming call is shown as the first entry (01) in the call log.
3. Press **>ENT** to continue.

4. Press **>ENT** again to confirm the call back
OR

to delete or save the entry in your call log, scroll to the desired option and then press **>ENT**.

Request the LL position of a buddy

DSC CALL
CALL LOG
DISTRES LOG
>LL REQUEST

LL REQUEST
>ALEX
JEAN
BILL

ALEX
LL REQUEST
ENT>SEND?

ALEX
LL REQUEST
CALLING..

PORT OPS/VTS
ALEX
LL REQUEST
WAITING ACK

POSITION ACK
ALEX
ESC->EXIT

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

You can use this option to contact a buddy and ask for their position. For example, if your buddy is in a good fishing spot, your buddy can send you the position in confidence, rather than revealing it over an voice channel.

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Scroll through the options and move the cursor to **LL REQUEST**. Press **>ENT**.
3. Press **>ENT** to select the first buddy in your buddy list, or scroll through the other entries until the cursor is next to the buddy whose position you want to check and then press **>ENT**.

4. The NS100 radio asks for confirmation. Press **>ENT** to send the LL position request to your buddy.
5. The radio checks the status of CH70 and if it is busy, waits for two seconds before rechecking. (The radio will repeat this cycle twice before returning to the normal working channel mode.)

When CH70 is free, the LL position request is sent and the TX symbol appears on the LCD screen.

6. The working channel is displayed while the radio waits for an acknowledgement from your buddy. If no acknowledgement is received within two minutes, the radio asks if you want to retry. Press **>ENT** to retry.

If your buddy hasn't acknowledged the LL position request after three minutes at your last attempt, the radio returns to normal working channel mode.

7. If the LL position request is acknowledged, your buddy's position data and the time are both displayed on the LCD screen.

Reference Section 4

Receiving DSC calls

Manually acknowledge an individual call.....
Automatically acknowledge an individual call.....
Reply to a group call.....
Reply to an all ships call.....
Manually reply to an LL position request.....
Automatically reply to an LL position request.....
Do not reply to an LL position request.....
Reply to a geographical call.....

IMPORTANT!

You must have stored a valid user MMSID into your NS100 radio in order to receive these DSC functions.

This reference section explains how to respond to the different types of incoming DSC calls.

Manually acknowledge an individual call

PORT OPS/VTX
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:INDIV
ROUTINE
567856789

ENT->ACK
ESC->EXIT

RCV:INDIV
567856789
ENT->ACK
ESC->EXIT

COMMERCIAL
N 39 27.021'
E135 12.011'
T 09:39 UTC

European radio models
require a manual
acknowledgement.

If you have set up your radio to respond to incoming DSC calls *manually* (see *Reference Section 2 - Select your response to individual calls*) the following happens when the radio picks up an incoming individual call:

1. The radio beeps to alert you to the incoming call. Press any key **except** **>ENT** or **<ESC** to stop the beeps.

At the same time, the LCD screen displays the BUSY symbol, the type of incoming call and the MMSID of the caller. After one second this LCD screen changes and invites you to press **>ENT** to acknowledge the call OR press **<ESC** to ignore it. These two screens alternate once every second for a maximum of three minutes.

If you press **<ESC** to ignore the call or do not respond within three minutes, the radio returns to its previous status.

If the radio recognises the MMSID as one of your buddies, it displays the buddy name in place of the MMSID.

2. Press **>ENT** if you want to acknowledge the call. The LCD screen displays the TX symbol and changes to CH70.
3. Press **>ENT** again to send an acknowledgement and automatically move to

a working channel.

The caller should now respond to your acknowledgement by making voice contact on the designated working channel. If not, you can use PTT to make voice contact yourself.

The details of the incoming call are stored in the call log. If the call log is full, the oldest entry is automatically deleted.

You can also store the MMSID of any call log entry in your buddy list, if you want. The radio will automatically copy the MMSID but you must enter the buddy name manually.

Automatically acknowledge an individual call

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:INDIV
ROUTINE
567856789
ESC->EXIT

COMMERCIAL
N 39 27.021'
E135 12.011'
T 09:39 UTC

If you have set up your radio to respond to incoming DSC calls *automatically* (see *Reference Section 2 - Select your response to individual calls*) the following happens when the radio picks up an incoming call:

1. The radio beeps to alert you to the incoming call. Press any key *except* **>ENT** or **<ESC** to stop the beeps now.

At the same time, the LCD screen displays the BUSY symbol, the type of incoming call, and the MMSID of the caller.

If the radio recognises the MMSID as one of your buddies, it displays the buddy name in place of the MMSID.

The radio also changes to CH70 automatically and displays the TX symbol.

If you press **<ESC** to ignore the call, or do not respond within three minutes, the radio returns to its previous status.

2. Press **>ENT** or **PTT** to send an acknowledgement on CH70. The radio moves to the designated working channel ready for your transmission.

The details of the incoming call are stored in the call log. If the call log is full, the oldest entry is automatically deleted.

You can also store the MMSID of any entry in your buddy list, if you want. The radio will automatically copy the MMSID but you must enter a name manually.

Reply to a group call

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:GROUP
URGENCY
RACING

FROM
034567891
ESC->EXIT

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:39 UTC

When the radio picks up an incoming call from any one of the groups that you have set up earlier:

1. The radio beeps to alert you to the incoming call. The type of beep depends upon the type of call. Press any key *except* **>ENT** or **<ESC** to stop the beeps.

IMPORTANT!

You must have stored at least one group MMSID into your radio in order to access this function. (See *Reference Section 2 - Enter a new group MMSID.*)

The radio automatically selects the working channel designated in the incoming call.

At the same time, the LCD screen displays the BUSY symbol, the type of incoming call, the group name and the designated channel. After one second this LCD screen changes and displays the group MMSID and invites you to press **<ESC** to exit. These two screens alternate once every second, for a maximum of three minutes.

If you press **<ESC** or do not respond within three minutes, the radio returns to its previous

status.

2. No acknowledgement is required. Just press **PTT** to communicate on the designated working channel.

The details of the incoming call are stored in the call log. If the call log is full, the oldest entry is automatically deleted.

Reply to an all ships call

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:ALL SHIPS
URGENCY
123456789
ESC->EXIT

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:39 UTC

The all ships ROUTINE category at 1W transmission power is available only in USA/ Canada.

When the radio picks up an incoming all ships call:

1. The radio beeps to alert you to the incoming call. The type of beep depends upon the type of call. Press any key *except* **PTT** or **<ESC** to stop the beeps now. The radio automatically selects CH16.

At the same time, the LCD screen displays the BUSY symbol, the type and priority of the incoming call, the MMSID of the caller, and invites you to press **<ESC** to exit.

If you press **<ESC** or do not respond within three minutes, the radio returns to its previous status.

If the radio recognises the MMSID as one of your buddies, it displays the buddy name in place of the MMSID.

2. No acknowledgement is required. Just press **PTT** to communicate on the designated working channel.

The details of the incoming call are stored in the call log. If the call log is full, the oldest entry is automatically deleted.

Manually reply to an LL position request

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:34 UTC

POSITION REQ
123451234
ENT->ACK
ESC->EXIT

RCV:POSITION
123451234
ENT->ACK
ESC->EXIT

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:39 UTC

You can reply to this request manually *only* if you have set the LL REPLY option to MANUAL. (See *Reference Section 2 - Select your response to LL polling calls.*)

When the radio receives an LL position request it sounds a beep to alert you to the request.

At the same time, the LCD screen displays the BUSY symbol, the position request and the MMSID of the caller.

1. If you press **<ESC>**, or do not respond to the request within three minutes, the radio returns to its previous state.

2. Press **>ENT** to acknowledge the call and transmit your position on CH70 automatically.

The LL position request is *not* stored in the call log.

Automatically reply to an LL position request

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:POSITION
123451234
REPLY AUTO
ESC->EXIT

123451234
N 39 27.021'
E135 12.011'
T 09:39 UTC

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:39 UTC

You can reply to this request automatically *only* if you have set the LL REPLY option to AUTO. (See *Reference Section 2 - Select your response to LL polling calls.*)

When the radio receives an LL position request it sounds a beep to alert you to the request.

At the same time, the LCD screen displays the BUSY symbol, the position request and the MMSID of the caller.

The radio acknowledges the request automatically, and immediately sends your boat's position to the caller.

The radio then returns automatically to its previous state.

Do not reply to an LL position request

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:POSITION
123451234
REPLY OFF
ESC->EXIT

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:39 UTC

When the radio receives an LL position request it beeps to alert you to the request.

At the same time, the LCD screen displays the BUSY symbol, the position request and the MMSID of the caller.

The radio shows that the reply facility is OFF. Just press **<ESC** or **PTT** to return to the previous state.

The LL position request is *not* stored in the call log.

Reply to a geographic call

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:POSITION
123451234
REPLY OFF

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:39 UTC

A geographical call can be received only by vessels within a certain radius of the transmission, typically 20-30 miles (32-48 kms).

When the radio picks up an incoming geographic call:

1. The radio beeps to alert you to the incoming call. Press any key *except* **PTT** or **<ESC** to stop the beeps now.

At the same time, the LCD screen displays the BUSY symbol, the type and priority of the incoming call, and the MMSID of the caller.

If you press **<ESC** to ignore the call, or do not respond within three minutes, the radio returns to its previous status.

If the radio recognises the MMSID as one of your buddies, it displays the buddy name in place of the MMSID.

2. You can reply to the incoming call with an **INDIVIDUAL** call back. The incoming call is stored in the call log.

Press **>ENT** to move to the designated working channel. If no channel is designated, CH 16 is automatically selected.

Press **PTT** to communicate on the designated working channel.

The details of the incoming call are stored in the call log. If the call log is full, the oldest entry is automatically deleted.

Reference Section 5

Distress calls

Send a distress call.....	
Receive and reply to a distress call.....	
Call back using the distress logs.....	
Receive a distress relay.....	
Receive a distress acknowledgment.....	

IMPORTANT!

You must have stored a valid user MMSID into your NS100 radio in order to access these DSC functions.

This reference section explains how to send, and respond to, different types of DSC distress calls. For distress calls, the radio is capable of automatically sending and receiving enhanced position information that specifies the position of the distressed vessel to within about 60ft (18m).

Send a distress call

DISTRESS CALL
>UNDEFINED
FIRE
FLOODING

DISTRESS CALL
>FIRE
HOLD DISTRESS
3 SECONDS

DISTRESS CALL
SENT! WAIT
PRESS ESC
TO CANCEL

If you *hold down* DISTRESS, an UNDEFINED distress call is transmitted automatically after a three second countdown.

1. Lift up the protective hinged cover from the red **DISTRESS** button, located on the right hand side of the handset.
2. Press **DISTRESS** to show the following distress categories on the LCD screen. Note that only four categories can be shown at any one time so use **^CH/SEL** to scroll up and **CH/SELv** to scroll down.

UNDEFINED
FIRE
FLOODING
COLLISION
GROUNDING
LISTING
SINKING
ADRIFT
ABANDONING
PIRACY
OVERBOARD

2. Scroll to the category that best describes your situation, then hold down **>ENT** or **DISTRESS** until the distress signal is transmitted at high power on CH70 at the end of a three second countdown.
If CH70 is already busy, the distress signal will override the existing transmission.

The distress call repeats randomly every 3.5 to 4.5 minutes until a distress acknowledgement is received from a Search and Rescue authority or until you cancel the distress call manually by pressing <ESC or 16/9.

After transmitting the distress call, the radio beeps loudly for 2 minutes and waits for a distress acknowledgement.

3. Press any key *except* **<ESC** or **16/9** if you want to stop the beeps while waiting for the distress acknowledgement. (Press **<ESC** or **16/9** only if you want to cancel the waiting phase and move to CH16.)
4. The radio selects CH16 automatically so that you can hear any incoming voice contacts from the Search and Rescue authorities and/or other vessels in your area.

Receive and reply to a distress call

PORT OPS/VTs
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:DISTRESS
123451234
FIRE
ESC->EXIT

RCV:DISTRESS
N 12.12.121'
E121.12.121'
T 09:36 UTC

IMPORTANT!

You can establish voice contact with the distressed vessel, as described here, but the Coast Guard is the only agency allowed to send a distress acknowledgement.

When the radio picks up an incoming distress call:

1. The radio beeps loudly to alert you to the incoming distress call and the working channel changes automatically to CH16. Press any key *except* **PTT** or **<ESC** if you want to stop the beeps.

At the same time, the LCD screen displays the BUSY symbol, the category of the distress, and the MMSID (or buddy name) of the distressed vessel. After one second, the LCD display changes to show the position of the distressed vessel and the time of the distress transmission.

These two screens alternate once every second, for a maximum of three minutes.

If the vessel's position isn't specified, a series of dashed lines are shown instead.

2. Press **PTT** to establish voice contact with the distressed vessel or press **<ESC** to maintain a listening watch on CH16.

The details of the incoming call are stored in the distress log. If the distress log is full, the oldest entry is automatically deleted.

Call back using the distress logs

DSC CALL
ALL SHIPS
CALL LOG
>DISTRESS LOG

DISTRESS LOG
>DISTRESS
RELAY

RCV:RELAY
678678678
FIRE
ESC->EXIT

RCV:DISTRESS
N 38 27.021'
E137 12.011'
T 12:27 UTC

IMPORTANT!

You can establish voice contact with the distressed vessel, but **ONLY** the Coast Guard is allowed to send a distress acknowledgement.

The radio has two distress logs that each hold the details of ten distress calls. The DISTRESS log stores received distress calls, and the RELAY log stores relayed distress calls.

You can reply to any of them with an INDIVIDUAL call back, as follows:

1. Press **CALL** to display the first three options of the **DSC CALL** menu.
2. Scroll through the options and move the cursor to **DISTRESS LOG**. Press **>ENT**.
3. Press **>ENT** again to select the received distress call log

OR

move the cursor to **RELAYED** and then press **>ENT** to select the relayed distress call log. The most recent incoming distress call is shown as the first entry in the log.

3. Press **>ENT** to select the first entry in the log, or scroll through the other entries until the cursor is next to the entry you want to call and then press **>ENT**.
4. The radio displays the details of the distress call. Press **>ENT** to continue.

The details are displayed over two screens that

alternate every one second; the first screen shows the MMSID (or buddy name) of the distressed vessel and the type of distress, the second screen shows the position of the distressed vessel, the time of the distress call and the MMSID (or buddy name) of the vessel that relayed the Distress Call.

If the vessel's position isn't specified, a series of dashed lines are shown instead.

5. Press **>ENT** to call back.

Receive a distress relay

PORT OPS/VTS N 39 27.021' E135 12.011' T 09:34 UTC

RCV:RELAY 123451234 FIRE ESC->EXIT

RCV:RELAY N 12.12.121' E121.12.121' T 09:36 UTC
--

RCV:RELAY SENT FROM 876587658 ESC->EXIT
--

When the radio picks up an incoming distress relay:

1. The radio beeps loudly to alert you to the incoming distress relay and the working channel changes automatically to CH16. Press any key *except* **PTT** or **<ESC** if you want to stop the beeps.

At the same time, the LCD screen displays the BUSY symbol, the MMSID (or buddy name) of the distressed vessel and the type of distress. After one second, the LCD screen changes to show the position of the distressed vessel and the time of the distress transmission. After another second, the LCD screen changes

again to show the MMSID (or buddy name) of the vessel relaying the distress call.

These three screens cycle once every second, for a maximum of three minutes.

If the position of the distressed vessel's isn't specified, a series of dashed lines are shown instead.

2. Press **PTT** to try and establish voice contact with the distressed vessel or press **<ESC** to maintain a listening watch on CH16.

The details of the incoming distress relay are stored in the distress log. If the distress log is full, the oldest entry is automatically deleted.

Receive a distress acknowledgement

PORT OPS/VTS
N 39 27.021'
E135 12.011'
T 09:34 UTC

RCV:DISTRESS
ACKNOWLEDGE
FROM
123451234

654365436
SINKING
N 39 27.021'
E135 12.011'

T 09:37 UTC
654365436
ESC->EXIT

When the radio picks up an incoming distress acknowledgement:

1. The radio beeps loudly for two minutes, to alert you to the incoming distress acknowledgement and the working channel changes automatically to CH16. Press any **<ESC** or **16/9** to stop the beeps.

At the same time, the LCD screen displays the distress acknowledgement and the MMSID (or buddy name) of the vessel sending the acknowledgement. After one second, the LCD screen changes to show the MMSID and position of the distressed vessel and the type of distress. After another second, the LCD screen changes again to show MMSID again and the time of the distress

acknowledgement.

These three screens cycle once every second, for a maximum of three minutes.

If the distressed vessel's position isn't specified, a series of dashed lines are shown instead.

2. Press **<ESC** or **16/9** to cancel the LCD screen cycle, then press **PTT** to try and establish voice contact with the coast guard or press **<ESC** again to maintain a listening watch on CH16.

Appendix A

Technical Specifications

The following pages show the technical specifications for the NS100 SS and the NS100 DS radios. These technical specifications are subject to change without notice.

NS100 SS

GENERAL

Power Supply:	13.6V DC.
Current drain:	
• Transmit	6A at 25W Tx / 1.5A at 1W Tx
• Receive	<350mA in standby
Useable channels	
(country-specific):	International
	USA
	Canada
	Weather
Modulation mode:	16K0G3E (FM)/16K0G2B (DSC)
Compass safe distance:	speaker - 2.1' (70mm)

PHYSICAL

LCD display (viewing):	48 (W) x 24 (H) mm
	FSTN 4 x 12 character
Contrast and	
backlight control:	Yes
Antenna connector:	SO-239 (50 ohm)
Temperature Range:	-15°C to +50°C
Waterproofing:	
• Handset	JIS-7
• Speaker/Box	IPX6
Dimensions:	
• Handset	68(W) x 140(H) x 30(T) mm
• Speaker	140(W) x 148(H) x 49(T) mm
• Box	220(W) x 173(H) x 50(T) mm
Weight:	
• Handset	10oz (0.28kg)
• Speaker	11oz (0.31kg)
• Box	3.0lbs (1.36kg)
Frequency stability:	+/- 10ppm
Frequency control:	PLL
GPS/NMEA input:	Yes
Comm. port:	4800 baud NMEA output

FEATURES

Local/Distant control:	Yes
Position polling:	Yes
Group Call:	Yes
Call logs:	Yes (20 individual, 10 distress, 10 distress relay)
DSC (USCG SC101)	Yes (USA/Canada)
DSC (Class D):	Yes (Europe)
Channel Naming:	Yes
Tri watch, Favorite	
channel scan, All scan:	Yes
Hailer function	
with 20W output:	No
Intercom function:	No
Second handset:	No
Second 4W external speaker:	No
Separate CH70 DSC receiver:	Yes (Europe only)

TRANSMITTER

Frequency:	156.025 - 157.425MHz
Output power:	25W / 1W selectable
Transmitter protection:	Open / short circuit of antenna with VSWR shutdown
Max Freq deviation:	+/- 5kHz
Spurious & harmonics:	Attenuated at least 43+10logPo (USA) 80db@25W, 60db@1W (EU)
Modulation distortion:	Less than 10%@ 1kHz for a +/- 3kHz deviation

RECEIVER

Frequency:	156.025 - 163.275MHz
12dB SINAD sensitivity:	0.25uV (distant) / 2.5uV (local) (USA models)
20db SINAD sensitivity:	0.35uV
Adjacent CH selectivity:	more than 70db

Spurious response	
intermodulation:	more than 70db
Rejection ratio:	more than 70db
Residual Noise level:	more than -40db unsquelched
Audio output power:	
• handset	1W
• external large speaker	2W

Specifications are subject to change without notice.

NS100 DS

GENERAL

Power Supply:	13.6V DC.
Current drain:	
• Transmit	6A at 25W Tx / 1.5A at 1W Tx
• Receive	Less than 400mA in standby
Useable channels (country-specific):	International USA Canada Weather
Modulation mode:	16K0G3E(FM)/16K0G2B (DSC)
Compass safe distance:	speaker - 2.1' (70mm)

• Handset	68(W) x 140(H) x 30(T) mm
• Speaker	140(W) x 148(H) x 49(T) mm
• Box	220(W) x 173(H) x 50(T) mm
Weight:	
• Handset	10oz (0.28kg)
• Speaker	11oz (0.31kg)
• Box	3.0lbs (1.36kg)
Frequency stability:	+/- 10ppm
Frequency control:	PLL
GPS/NMEA input:	Yes
Comm. port:	4800 baud NMEA output

FEATURES

PHYSICAL

LCD display (viewing):	48 (W) x 24 (H) mm FSTN 4 x 12 character
Contrast and backlight control:	Yes
Antenna connector:	SO-239 (50 ohm)
Temperature Range:	-15°C to +50°C
Waterproofing:	
• Handset	JIS-7
• Speaker/Box	IPX6
Dimensions:	

Local/Distant control:	Yes
Position polling:	Yes
Group Call:	Yes
Call logs:	Yes (20 individual, 10 distress, 10 distress relay)
DSC (USCG SC101)	Yes (USA/Canada)
DSC (Class D):	Yes (Europe)
Channel Naming:	Yes
Tri watch, Favorite channel scan, All scan:	Yes
Hailer function	

with 20W output: Yes
Intercom function: Yes
Second handset: Yes
Second 4W external speaker: Yes
Separate CH70 DSC receiver: Yes (Europe only)

TRANSMITTER

Frequency: 156.025 - 157.425MHz
Output power: 25W / 1W selectable
Transmitter protection: Open / short circuit of antenna
with VSWR shutdown
Max Freq deviation: +/- 5kHz
Spurious & harmonics: Attenuated at least 43+10logPo (USA)
80dB@25W, 60dB@1W (EU)
Modulation distortion: Less than 10%@ 1kHz for a +/-
3kHz deviation

RECEIVER

Frequency: 156.025 - 163.275MHz
12dB SINAD sensitivity: 0.25uV (distant) / 2.5uV (local)
(USA models)
20db SINAD sensitivity: 0.35uV
Adjacent CH selectivity: more than 70db
Spurious response
intermodulation: more than 70db
Rejection ratio: more than 70db
Residual Noise level: more than -40db unsquelched
Audio output power:
• handset 1W
• external large speaker 2W
• hailer: 20W into 4 Ohms

Specifications are subject to change without notice.

Appendix B

Troubleshooting

The following pages provide some tips on solving the more common problems that may occur from time to time. If you're not able to solve a problem, contact your Northstar dealer for advice.

PROBLEM: The transceiver will not power up.

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

- a) Check the power cable for cuts, breaks, or squashed sections.
- b) After checking the wiring, replace the 10A fuse (one spare fuse is supplied).
- c) Check the battery voltage. This must be at least $10.8V \pm 0.5V$ DC.

PROBLEM: The transceiver blows the fuse when the power is switched on.

The power wires may have been reversed.

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

PROBLEM: The speaker makes popping or whining noises when the engine is running.

Electrical noise may be interfering with the transceiver.

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

PROBLEM: No sound from the external speaker.

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

PROBLEM: Transmissions are always on low power, even when high (HI) power is selected.

The antenna may be faulty.

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

PROBLEM: Battery symbol is displayed.

The power supply is too low or too high.

- a) Check the battery voltage. This should be at least $10.8V \pm 0.5V$ DC.
- b) Check the alternator on the vessel.

PROBLEM: No position information is displayed.

The GPS cable may faulty or the GPS setting may be incorrect.

- a) Check that the GPS cable is physically connected.
- b) Check the polarity of the GPS cable.
- c) Check the baud rate setting of the GPS if applicable. The baud rate setting should be 4800 for NMEA. Parity should be set to NONE.

VHF Marine Channel Banks

International channel banks.....
USA channel banks.....
Canadian channel banks.....
Country-specific inland waterways (Europe).....

The following pages show details of the VHF marine channel banks being used in different parts of the world.

International channel banks

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

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
60	156.025	160.625	Public Correspondence, Duplex	No	Yes	TELEPHONE
61	156.075	160.675	Port Operations, Duplex	No	Yes	PORT OPS
62	156.125	160.725	Port Operations, Duplex	No	Yes	PORT OPS
63	156.175	160.775	Port Operations, Duplex	No	Yes	PORT OPS
64	156.225	160.825	Public Correspondence, Duplex	No	Yes	TELEPHONE
65	156.275	160.875	Port Operations, Duplex	No	Yes	PORT OPS
66	156.325	160.925	Port Operations, Duplex	No	Yes	PORT OPS
67	156.375	156.375	Commercial, bridge-to-bridge	Yes	No	BRIDGE COM
68	156.425	156.425	Boat Operations, Recreational	Yes	No	SHIP - SHIP
69	156.475	156.475	Port Operations	Yes	Yes	PORT OPS
70 ³	156.525	156.525	Digital Selective Calling - DSC	-----	-----	DSC
71	156.575	156.575	Port Operations	Yes	Yes	PORT OPS
72	156.625	156.625	Intership	Yes	No	SHIP - SHIP
73	156.675	156.675	Port Operations	Yes	Yes	PORT OPS
74	156.725	156.725	Port Operations	Yes	Yes	PORT OPS
77	156.875	156.875	Intership	Yes	No	SHIP - SHIP
78	156.925	161.525	Non-Commercial, Duplex	No	Yes	SHIP - SHORE
79	156.975	161.575	Commercial, Duplex	No	Yes	SHIP - SHORE
80	157.025	161.625	Commercial, Duplex	No	Yes	SHIP - SHORE
81	157.075	161.675	Port Operations, Duplex	No	Yes	PORT OPS
82	157.125	161.725	Port Operations, Duplex	No	Yes	PORT OPS
83	157.175	161.775	Public Correspondence, Duplex	No	Yes	TELEPHONE
84	157.225	161.825	Public Correspondence, Duplex	No	Yes	TELEPHONE
85	157.275	161.875	Public Correspondence, Duplex	No	Yes	TELEPHONE
86	157.325	161.925	Public Correspondence, Duplex	No	Yes	TELEPHONE
87	157.375	161.975	Public Correspondence, Duplex	No	Yes	TELEPHONE
88	157.425	162.025	Public Correspondence, Duplex	No	Yes	TELEPHONE

WEATHER						NAME TAG
Wx01	RX Only	162.550	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx02	RX Only	162.400	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx03	RX Only	162.475	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx04	RX Only	162.425	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx05	RX Only	162.450	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx06	RX Only	162.500	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx07	RX Only	162.525	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx08	RX Only	161.650	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx09	RX Only	161.775	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx10	RX Only	163.275	NOAA WEATHER CHANNEL	-----	-----	NOAA WX

SPECIAL NOTES ON INTERNATIONAL CHANNEL USAGE

1. LOW POWER (1W) only.
2. LOW POWER (1W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normal in bridge-to-bridge communications.
3. 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.
4. The INTERNATIONAL mode is not legal for use in U.S. or Canada waters.

USA channel banks

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
01A	156.050	156.050	Port Operation, VTS in Selected Areas	Yes	Yes	PORT OPS/VTS
03A ⁴	156.150	156.150	US Government, Coast Guard	Yes	Yes	UNAUTHORIZED
05A	156.250	156.250	Port Operations, VTS in Selected Areas	Yes	Yes	PORT OPS/VTS
06	156.300	156.300	Inter-ship Safety	Yes	No	SAFETY
07A	156.350	156.350	Commercial	Yes	Yes	COMMERCIAL
08	156.400	156.400	Commercial (inter-ship only)	Yes	No	COMMERCIAL
09	156.450	156.450	Recreational Calling Channel	Yes	Yes	CALLING
10	156.500	156.500	Commercial	Yes	Yes	COMMERCIAL
11	156.550	156.550	Commercial, VTS in Selected Areas	Yes	Yes	VTS
12	156.600	156.600	Port Operations, VTS in Selected Areas	Yes	Yes	PORT OPS/VTS
13 ³	156.650	156.650	Intership Navigation Safety (bridge-to-bridge), 1W with Power-up	Yes	No	BRIDGE COM
14	156.700	156.700	Port Operations, VTS in Selected Areas	Yes	Yes	PORT OPS/VTS
15 ²	RX Only	156.750	Environmental, RX Only	-----	-----	ENVIROMENTAL
16	156.800	156.800	International Distress, Safety, and Calling	Yes	Yes	DISTRESS
17 ¹	156.850	156.850	State Controlled – 1W Only	Yes	Yes	SAR
18A	156.900	156.900	Commercial	Yes	Yes	COMMERCIAL
19A	156.950	156.950	Commercial	Yes	Yes	COMMERCIAL
20	157.000	161.600	Port Operations, Canadian Coast Guard, Duplex	No	Yes	PORT OPS
20A	157.000	157.000	Port Operations	Yes	Yes	PORT OPS
21A ⁴	157.050	157.050	U.S. Government, Canadian Coast Guard	Yes	Yes	UNAUTHORIZED
22A	157.100	157.100	Coast Guard Liaison	Yes	Yes	COAST GUARD
23A ⁴	157.150	157.150	U.S. Government, Coast Guard	Yes	Yes	UNAUTHORIZED
24	157.200	161.800	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
25	157.250	161.850	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
26	157.300	161.900	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
27	157.350	161.950	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
28	157.400	162.000	Public Correspondence, Marine Operator	No	Yes	TELEPHONE

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
61A ⁴	156.075	156.075	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
63A	156.175	156.175	Port Operations, VTS in Selected Areas	Yes	Yes	PORT OPS/ VTS
64A ⁴	156.225	156.225	<i>U.S. Government, Canadian Commercial Fishing</i>	Yes	Yes	UNAUTHORIZED
65A	156.275	156.275	Port Operations	Yes	Yes	PORT OPS
66A	156.325	156.325	Port Operations	Yes	Yes	PORT OPS
67 ³	156.375	156.375	Commercial, bridge-to-bridge, 1W with Power-up	Yes	No	BRIDGE COM
68	156.425	156.425	Boat Operations, Recreational	Yes	No	SHIP - SHIP
69	156.475	156.475	Boat Operations, Recreational	Yes	Yes	PLEASURE
70 ⁶	156.525	156.525	Digital Selective Calling - DSC	-----	-----	DSC
71	156.575	156.575	Boat Operations, Recreational	Yes	Yes	PLEASURE
72	156.625	156.625	Boat Operations, Recreational	Yes	No	SHIP - SHIP
73	156.675	156.675	Port Operations	Yes	Yes	PORT OPS
74	156.725	156.725	Port Operations	Yes	Yes	PORT OPS
77 ¹	156.875	156.875	Port Operations –1W Only	Yes	Yes	PORT OPS
78A	156.925	156.925	Boat Operations, Recreational	Yes	No	SHIP - SHIP
79A	156.975	156.975	Commercial	Yes	Yes	COMMERCIAL
80A	157.025	157.025	Commercial	Yes	Yes	COMMERCIAL
81A ⁴	157.075	157.075	<i>U.S. Government, Environmental Protection Agency Operations</i>	Yes	Yes	UNAUTHORIZED
82A ⁴	157.125	157.125	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
83A ⁴	157.175	157.175	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
84	157.225	161.825	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
85	157.275	161.875	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
86	157.325	161.925	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
87	157.375	161.975	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
88	157.425	162.025	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
88A	157.425	157.425	Commercial, Intership Only	Yes	No	COMMERCIAL

WEATHER						NAME TAG
Wx01	RX Only	162.550	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx02	RX Only	162.400	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx03	RX Only	162.475	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx04	RX Only	162.425	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx05	RX Only	162.450	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx06	RX Only	162.500	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx07	RX Only	162.525	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx08	RX Only	161.650	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx09	RX Only	161.775	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx10	RX Only	163.275	NOAA WEATHER CHANNEL	-----	-----	NOAA WX

SPECIAL NOTES ON USA CHANNEL USAGE

1. LOW POWER (1W) only.
2. Receive Only.
3. LOW POWER (1W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normal 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.
6. 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.

Canadian channel banks

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

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
28B	RX Only	162.000	Public Correspondence, RX Only	-----	-----	TELEPHONE
60	156.025	160.625	Public Correspondence, Duplex	No	Yes	TELEPHONE
61A ⁴	156.075	156.075	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
62A	156.125	156.125	Canadian Coast Guard	Yes	Yes	CANADIAN CG
64	156.225	160.825	Public Correspondence, Duplex	No	Yes	TELEPHONE
64A ⁴	156.225	156.225	<i>U.S. Government, Canadian Commercial Fishing</i>	Yes	Yes	UNAUTHORIZED
65A	156.275	156.275	Port Operations	Yes	Yes	PORT OPS
66A ¹	156.325	156.325	Port Operations – 1W Only	Yes	Yes	PORT OPS
67	156.375	156.375	Commercial, SAR	Yes	No	COMMERCIAL
68	156.425	156.425	Boat Operations, Recreational	Yes	No	SHIP - SHIP
69	156.475	156.475	Commercial Fishing Only	Yes	Yes	COMMERCIAL
70 ⁶	156.525	156.525	Digital Selective Calling - DSC	-----	-----	DSC
71	156.575	156.575	Boat Operations, Recreational	Yes	Yes	PLEASURE
72	156.625	156.625	Intership	Yes	No	SHIP - SHIP
73	156.675	156.675	Commercial Fishing Only	Yes	Yes	COMMERCIAL
74	156.725	156.725	Commercial Fishing Only	Yes	Yes	COMMERCIAL
77 ¹	156.875	156.875	Port Operations –1W Only	Yes	Yes	PORT OPS
78A	156.925	156.925	Boat Operations, Recreational	Yes	No	SHIP - SHIP
79A	156.975	156.975	Commercial	Yes	Yes	COMMERCIAL
80A	157.025	157.025	Commercial	Yes	Yes	COMMERCIAL
81A ⁴	157.075	157.075	<i>U.S. Government Operations</i>	Yes	Yes	UNAUTHORIZED
82A ⁴	157.125	157.125	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
83	157.175	161.775	Canadian Coast Guard	Yes	Yes	CANADIAN CG
83A ⁴	157.175	157.175	<i>U.S. Government, Canadian Coast Guard</i>	Yes	Yes	UNAUTHORIZED
83B	RX Only	161.775	Canadian Coast Guard, RX Only	-----	-----	CANADIAN CG
84	157.225	161.825	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
85	157.275	161.875	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
86	157.325	161.925	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
87	157.375	161.975	Public Correspondence, Marine Operator	No	Yes	TELEPHONE
88	157.425	162.025	Public Correspondence, Marine Operator	No	Yes	TELEPHONE

WEATHER						NAME TAG
Wx01	RX Only	162.550	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx02	RX Only	162.400	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx03	RX Only	162.475	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx04	RX Only	162.425	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx05	RX Only	162.450	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx06	RX Only	162.500	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx07	RX Only	162.525	NOAA WEATHER CHANNEL	-----	-----	NOAA WX
Wx08	RX Only	161.650	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx09	RX Only	161.775	CANADIAN WEATHER CHANNEL	-----	-----	CANADA WX
Wx10	RX Only	163.275	NOAA WEATHER CHANNEL	-----	-----	NOAA WX

SPECIAL NOTES ON CANADA CHANNEL USAGE

1. LOW POWER (1W) only.
2. Receive Only.
3. LOW POWER (1W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normal 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.
6. 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.
7. The CANADA mode is not legal to use in U.S. waters.

Country-specific inland waterways (Europe)

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

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
60	156.025	160.625	Public Correspondence, Duplex	No	Yes	TELEPHONE
61	156.075	160.675	Port Operations, Duplex	No	Yes	PORT OPS
62	156.125	160.725	Port Operations, Duplex	No	Yes	PORT OPS
63	156.175	160.775	Port Operations, Duplex	No	Yes	PORT OPS
64	156.225	160.825	Public Correspondence, Duplex	No	Yes	TELEPHONE
65	156.275	160.875	Port Operations, Duplex	No	Yes	PORT OPS
66	156.325	160.925	Port Operations, Duplex	No	Yes	PORT OPS
67	156.375	156.375	Commercial, bridge-to-bridge	Yes	No	BRIDGE COM
68	156.425	156.425	Boat Operations, Recreational	Yes	No	SHIP - SHIP
69	156.475	156.475	Port Operations	Yes	Yes	PORT OPS
70 ³	156.525	156.525	Digital Selective Calling - DSC	-----	-----	DSC
71	156.575	156.575	Port Operations	Yes	Yes	PORT OPS
72	156.625	156.625	Intership	Yes	No	SHIP - SHIP
73	156.675	156.675	Port Operations	Yes	Yes	PORT OPS
74	156.725	156.725	Port Operations	Yes	Yes	PORT OPS
77	156.875	156.875	Intership	Yes	No	SHIP - SHIP
78	156.925	161.525	Non-Commercial, Duplex	No	Yes	SHIP - SHORE
79	156.975	161.575	Commercial, Duplex	No	Yes	SHIP - SHORE
80	157.025	161.625	Commercial, Duplex	No	Yes	SHIP - SHORE
81	157.075	161.675	Port Operations, Duplex	No	Yes	PORT OPS
82	157.125	161.725	Port Operations, Duplex	No	Yes	PORT OPS
83	157.175	161.775	Public Correspondence, Duplex	No	Yes	TELEPHONE

SPECIAL CHANNELS ⁷

CHANNEL	TRANSMIT (MHz)	RECEIVE (MHz)	TRAFFIC TYPE	SHIP TO SHIP	SHIP TO SHORE	NAME TAG
00 ⁶	156.000	156.000	UK Coast Guard Users	Yes	Yes	UK COAST GUARD
M1	157.425	157.850	UK Marina Channel M1	Yes	Yes	UK MARINA
M2	161.425	161.425	UK Marina Channel M2	Yes	Yes	UK MARINA
31	157.550	162.150	INT'L, Duplex (Holland)	No	Yes	NL MARINA
96H	162.425	162.425	INT'L (Belgium)	No	Yes	BEL G MARINA
L1	155.500	155.500	INT'L (Scandinavia)	Yes	no	LEISURE 1
L2	155.525	155.525	INT'L (Scandinavia)	Yes	no	LEISURE 2
L3	155.650	155.650	INT'L (Scandinavia – not in Denmark)	Yes	no	LE ISURE3
F1	155.625	155.625	INT'L (Scandinavia)	Yes	no	FISHING 1
F2	155.775	155.775	INT'L (Scandinavia)	Yes	no	FISHING 2
F3	155.825	155.825	INT'L (Scandinavia) call back	Yes	no	FISHING 3
AIS1	161.975	161.975	AIS1	-----	-----	-----
AIS2	162.025	162.025	AIS2	-----	-----	-----

SPECIAL NOTES ON EUROPEAN INTERNATIONAL CHANNEL USAGE

1. LOW POWER (1W) only.
2. LOW POWER (1W) initially. Override to HIGH POWER by holding down H/L key before transmitting. Used normally in bridge-to-bridge communications.
3. 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.
4. The INTERNATIONAL mode is not legal for use in U.S.A. or Canada waters.
5. No WX channels are available.
6. **Lightly Shaded Simplex channel CH00 is only available in the UK to Coast Guard users with written authorization.**
7. The special channels above (and others) may be fitted to your radio. These are only licensed for use in the country indicated. No attempt should be made to use them in any other country.

