USER MANUAL

VHF RADIO (DSC CLASS D)

NVR-2000

NVR-2000 OM.E 20251011-04

Notice to Users

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- Please read this manual carefully to ensure proper use before installation and use of the NVR-2000.
- Please keep the manual for your future reference.

Some Frequently Asked Questions

How to check out own ship's MMSI?

Own ship's MMSI will show up shortly when the NVR-2000 is powered on.

You may also check out the MMSI in "MMSI/GNSS INFO".

How to setup own ship's MMSI?

The MMSI can be set after the device is turned on for the first time. If you need to modify it, please contact NSR or your local agent.

How to send a TEST call to another station?

Send a test call to another station in MENU--OTHER CALL--Type: Test Call. Wait for the reply from the called station.

How to reply TEST call from other stations?

When Test ACK is set as Auto in MENU---- DSC SETTING----Auto ACK, the NVR-2000 will automatically reply to test call from other stations.

Safety Instructions for the Operator

	**Warning** Keep away from heat source or direct sunshine.
	**Prohibition** Don’t open the equipment. Only qualified personnel should work inside the equipment. Don’t disassemble or try to modify the equipment.
	**Dangerous** Turn off the power immediately when smoke or fire is emitted.

Modify Record

No.	Modify by	Date	Paragraph	Version	Reason
1	Q/A	2024/01/26		01	First edition
2	Q/A	2025/01/25	All	02	General modification
3	Q/A	2025/07/18	All	03	Some modification
4	Q/A	2025/10/11	All	04	Some modification

Version Comparison Table

Manual Version	Software Version	Remarks
20240126_01	1.013	
20250125_02	1.023	
20250718_03	1.023	
20251011_04	1.023	

Table of Contents

1. OVERVIEW

NVR-2000 is a ship-borne radiotelephone equipment on VHF FM and designed for marine mobile service, which provides the function of VHF radiotelephone and digital selective calling (class D).

NVR-2000 conforms to the regulations of ITU Regulation Appendix 18 (revised on WRC-19), IMO MSC.1/Circ.1460/Rev.5, ITU-R M.493-16, ITU-R M.541-11, IEC 61097-7, IEC 61097-3, IEC 60945.

It contains a VHF radio transceiver, a digital selective calling system and a dedicated digital selective calling receiver to comply with the ITU Radio Regulations. A built-in GNSS receiver is also available. Channel No. can be 2-digit or 4-digit to meet the latest regulations of IMO and ITU.

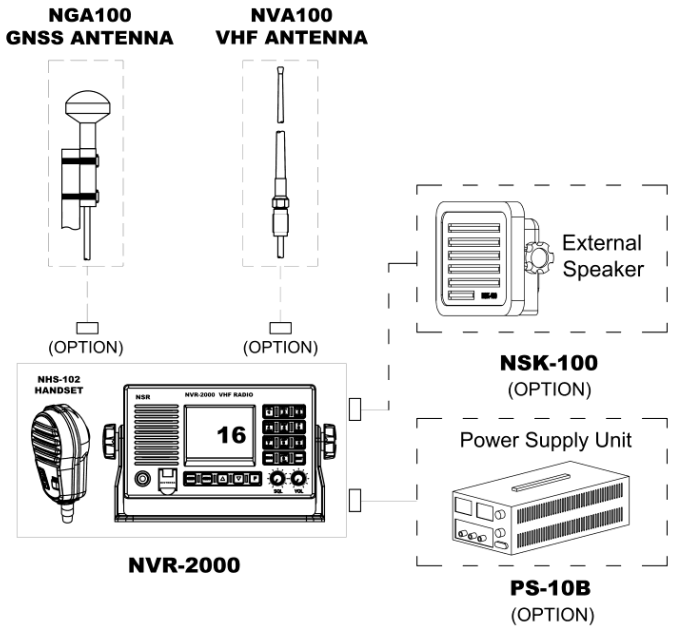
The main features are as follows:

Channels	International Standard Channel (ITU), America Channel (USA), Canada Channel (CAN), Weather Channel (WX), Private Channel (PRV).
RF output	25W (HIGH) / 1W (LOW)
Dual watching	Watching channel 16 and other channels simultaneously is available.
Channel scan	Channels are scanned to sample any signal to be received.

2. CONFIGURATIONS

2.1 SYSTEM CONFIGURATIONS

The figure below shows the equipment configurations.



2.2 SUPPLY SCOPE

No.	Item	Q'ty	Part No.	Remarks
	Standard			
1	NVR-2000 VHF RADIOTELEPHONE	1	N991220	
2	NHS-102 MICROPHONE	1		
3	FITTING MATERIALS	1		
4	USER MANUAL	1		
	Optional			
1	NGA100 GNSS ANTENNA	1		With a 10m cable
2	NVA100 VHF ANTENNA	1	N582010	
3	NSK-100 EXTERNAL SPEAKER	1	N502614	
4	PS-10B POWER SUPPLY UNIT	1	N993420	13.8V/10A
5	FLUSH MOUNT BRACKET	1	N561020	

3. SPECIFICATIONS

3.1 GENERAL SPECIFICATIONS

Frequency range	Transmit: 156.025 ~ 157.425 MHz Receive: 156.050 ~ 163.275 MHz
The number of channels	ITU channel: 65 channels USA channel: 46 channels CAN channel: 75 channels WX (Weather): channel: 10 channels PRV (Private) channel: 100 channels
Communication type	SIMPLEX and SEMI-DUPLEX
Emission type	VOICE : G3E，DSC : G2B
DSC class	Class D
VHF antenna impedance	50Ω
Built-in GNSS	GPS, BDS, Glonass
Input power	DC 13.8V(range 12V ~ 15V), 5A
Interface	GNSS INPUT: RS422, 4800bps
Environment	Temperature: -15℃ ~ +55℃ Humidity: 93%, +40℃ Compass Safe Distance: Standard Compass: 0.25m, Steering Compass: 0.15m
Size and weight	137 (H) x 233 (W) x 91 (D) mm, 1.3kg (Transceiver)
IP grade	IP22 (Transceiver, Microphone), IP66 (Antenna)

3.2 TRANSMITTER

Output power	25W (High), 1W (Low)
Maximum frequency shift	≤±5kHz
Modulation type	FM (pre-emphasis 6dB/octave)
Frequency error	≤±1.5kHz
Occupied frequency band	≤±16kHz
Spurious emission	≤2.5μW (less than -26dBm)
Frequency stability	≤±10 x 10^{-6}
Upper audio limit	≤3kHz

3.3 RECEIVER

Sensitivity	≤2uV e.m.f (SINAD=20dB)
Adjacent selectivity	≥70dB
Signal to noise ratio	≥40dB (1kHz, 70% modulated, 30dBμV RF input)
Spurious response rejection	≥70dB
Spurious emission	≤2nW (9kHz～2GHz)
Intermodulation rejection	≥65dB
Harmonic distortion	≤10%
Max Audio output	3W

3.4 DSC FUNCTION

Signal format and protocol	Comply with the ITU-R M.493-16 and M.541-11
Emission type	G2B
Modulation frequency	MARK(signal Y) : 1,300Hz ± 10Hz SPACE(signal B) : 2,100Hz ± 10Hz
Transmission speed	1,200bps ± 30 x 10^{-6}

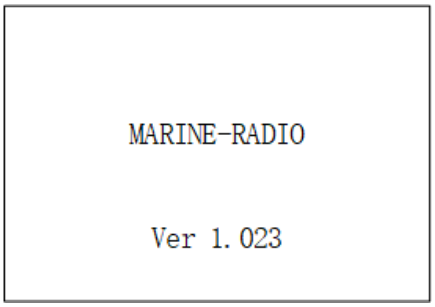
4. STARTING SYSTEM

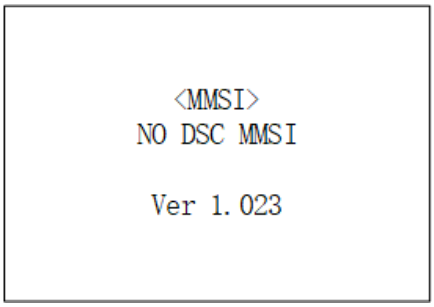
4.1 POWER ON

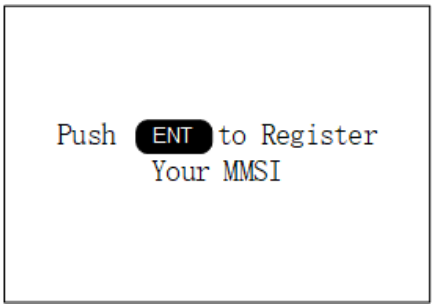
To start NVR-2000, follow the steps below:

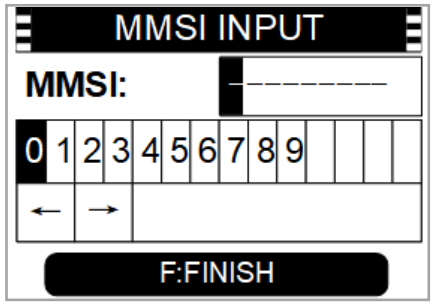
① Power on the equipment by turning the power switch (volume switch) clockwise.

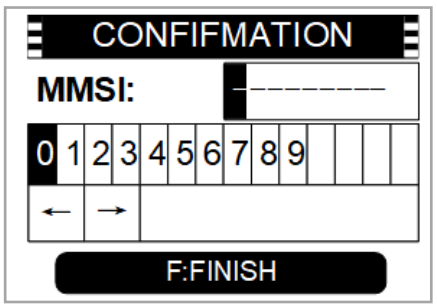
② If the equipment is switched on initially, the program will be booted and it requires MMSI input as shown below, then press **ENT** key to return to the initial screen and enter MMSI.

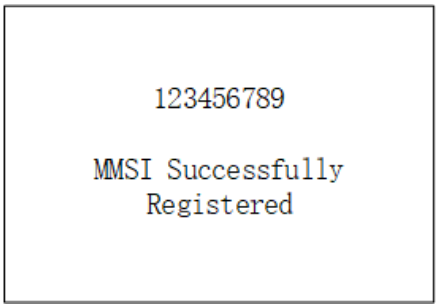




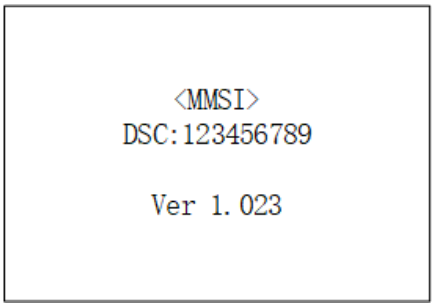




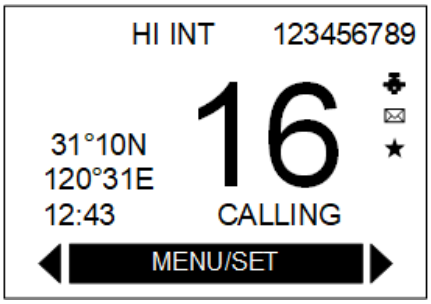




③ If own ship's MMSI is set, the right figure will appear when the equipment is powered on.



④ If the program booting is completed, the initial screen will be displayed as the right figure.



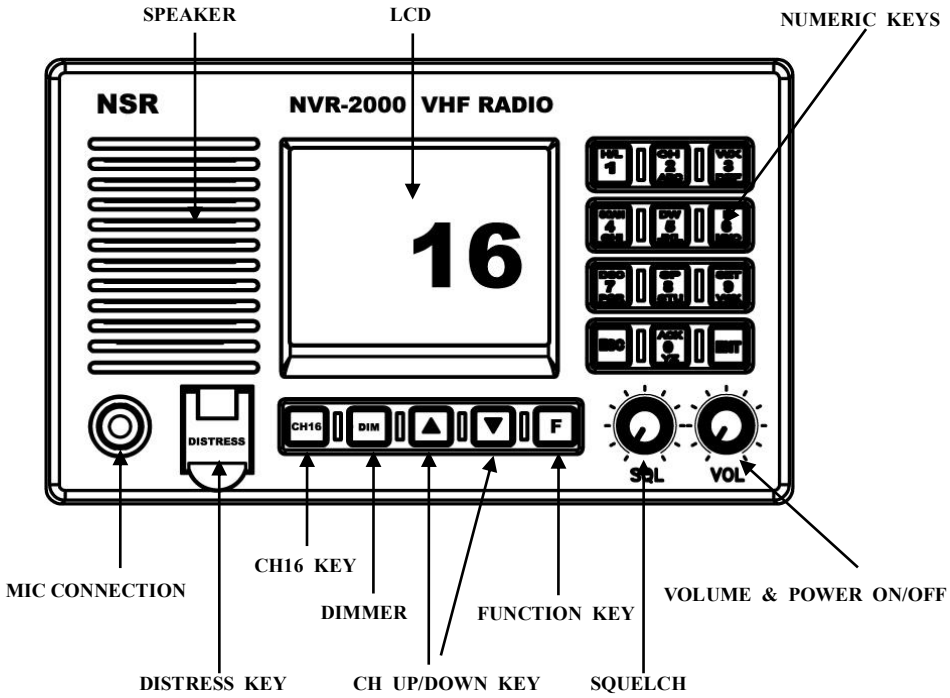
4.2 POWER OFF

To power off the equipment, turn the volume switch anti-clockwise until a“click” is heard.

5. BASIC OPERATION

5.1 KEYS ON THE FRONT PANEL

A distress key, menu keys, number keys, and up/down keys are on the front panel.



5.2 KEY DESCRIPTIONS

VOLUME & POWER ON/OFF		To power on/off or to adjust the speaker volume.
SQUELCH		It is used to remove the noise. Adjust the squelch level slightly higher than the point where the noise is removed. Note: if the squelch level is too high, a weak signal could be ignored.
DIMMER		Change the brightness of the LCD.
TX POWER		Set the transmitting power to 25W or 1W.

CHANNEL MODE		Change to the desired channel mode among ITU, USA, CAN channels.
WX CHANNEL		Change to weather channel mode (there are 10 channels in the weather mode).
PRIVATE CHANNEL		Change to private channel mode.

5.3 BASIC OPERATION

When powered on, the equipment will be initialized and set the default channel to CH16.

① **Initiate a voice call**: Set the transceiver to the desired channel. Hang off the microphone and press the PTT button on the microphone and speak. “TX” will be indicated on the LCD while PTT is pressed. Release the PTT button to change the transceiver to the receiving status.
Note: During transmission, the speaker is automatically muted.

② **End of call**: After the voice call is completed, hang up the microphone and the transceiver will return to CH16 in receiving mode automatically.

③ **DUAL WATCHING**: An additional channel and channel 16 are scanned. The additional channel is sampled for 1.85s and channel 16 is sampled for 0.15s. To stop scanning, press the “ESC” button.

④ **Up/down key**: It is used to change the channel number or move a cursor in the menu screen.

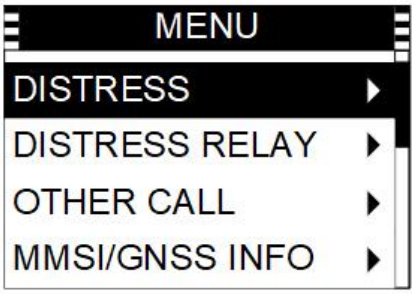
DUAL WATCH:

In DUAL WATCH, Channel 16 and an additional channel will be scanned to be watched. The additional channel can be selected by “F” key and “5/DW” key.

- Generally, CH16 will be sampled for 0.15s while the additional channel is sampled for 1.85s.
- When a signal is detected on CH16 during sampling, the scanning will stop and the receiver will stay on CH16 for receiving. As soon as the signal disappears on CH16, the scanning between the two channels will be restored.
- If a signal is detected on the additional channel during sampling, the transceiver will continue sampling of 0.15s on CH16 every 2s when receiving on the additional channel. Whenever a signal is detected on CH16 during sampling, the transceiver will stay on CH16 for receiving, by ignoring the signal on the additional channel.

6. MENU OPERATIONS

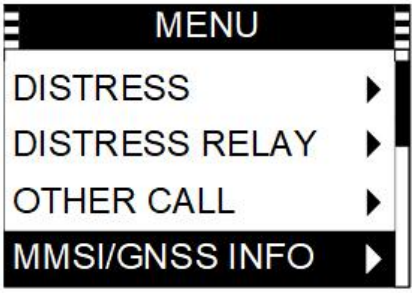
Press two keys in turn to enter the MENU screen as in the right figure. It includes **[DISTRESS]**, **[DISTRESS RELAY]**, **[OTHER CALL]**, **[MMSI/GNSS INFO]**, **[CONFIGURATION]**, **[DSC LOG]**, **[RADIO SETTING]**, **[DSC SETTING]** and **[ATIS SETTING]** items.

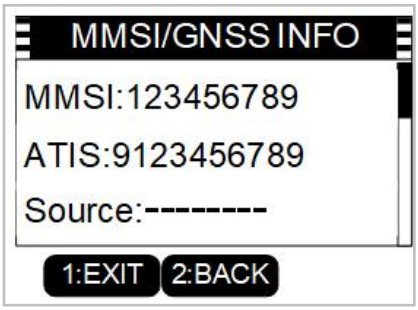


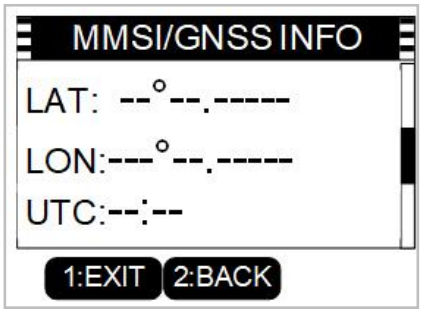
Press up/down key to select the desired menu item and press "ENT" key to enter the menu.
To return to the previous screen, press the "**ESC**" key in the menu screen.

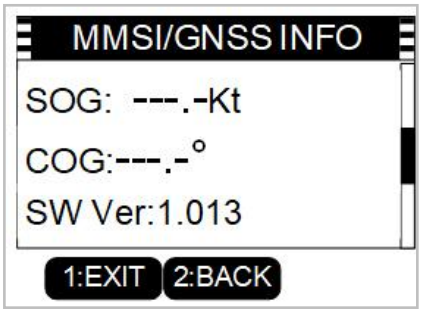
6.1 MMSI/GNSS INFORMATION

[MMSI/GNSS INFO] window includes the following information.
MMSI: Own ship MMSI code.
ATIS: Own ship ATIS code.
Source: Display GNSS information sources, External: indicates that GNSS information originates from external inputs. Internal: Derived from internal GNSS information.
LAT: The latitude of GNSS information.
LON: The longitude of GNSS information.
UTC: UTC time of GNSS information.
SOG: The speed of GNSS information.
COG: The heading of GNSS information.
SW Ver: the firmware version of the intercom software.

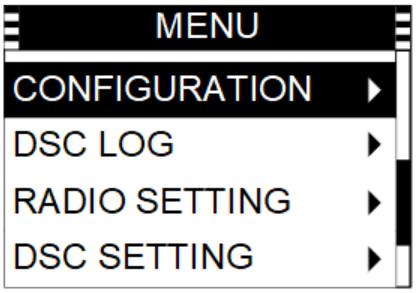








6.2 CONFIGURATION



[CONFIGURATION] window includes **[Backlight]**, **[Key Beep]**, **[Key Assignment]**, **[UTC Offset]**, **[NMEA SI Baud]**, **[No POS Alarm]** and **[Inactivity Timer]** items.

Note:

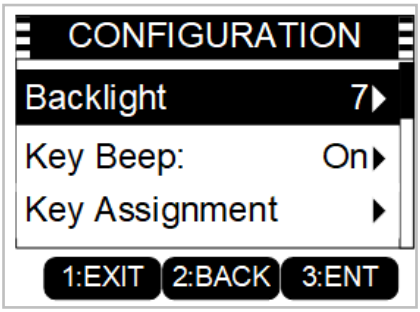
1:EXIT: Exit the menu screen.

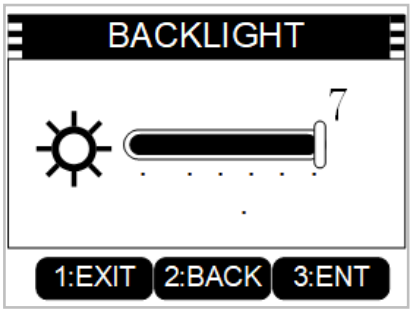
2:BACK: Back to the upper menu.

3:ENT: Confirm the setting or go to the next menu.

- **Backlight:**

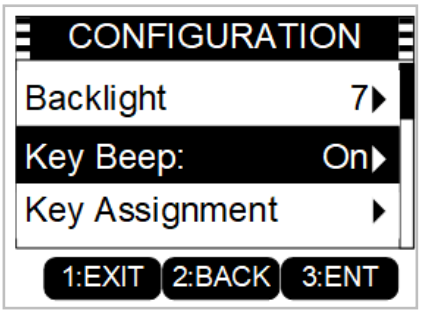
Backlight brightness is available in 7 levels and OFF.

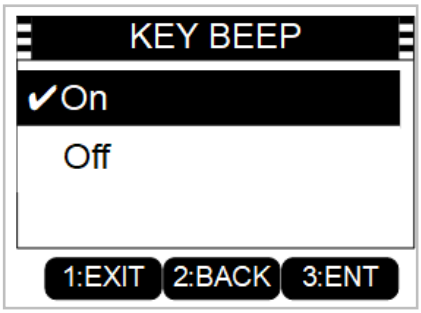




- **Key Beep:**

You can turn off the key tone to mute the operation or turn on the prompt tone.





- **Key Assignment:**

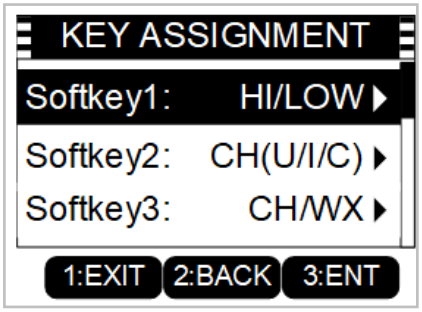
Desired functions can be assigned to soft keys.

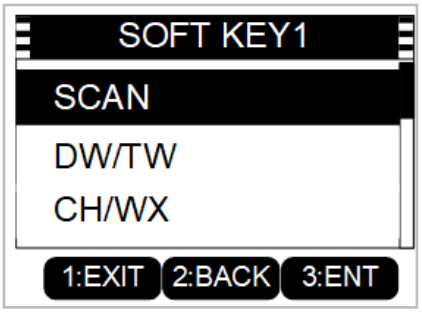
① On the displayed interface of "Key Assignment", press ▲ or ▼ key to select the softkey you want to set, and then press ENT key to enter the setting.

② Press ▲ or ▼ key to select the function the option wants, then press ENT

key to confirm the setting.

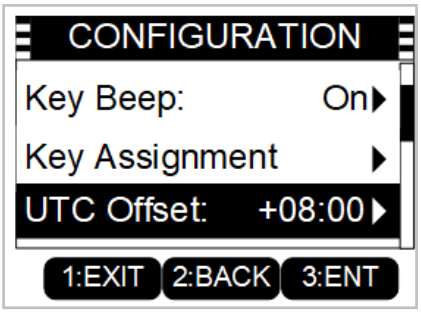
For example:

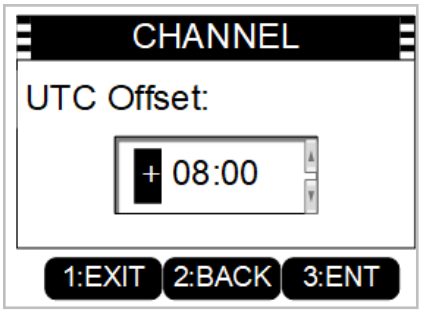




- **UTC Offset**

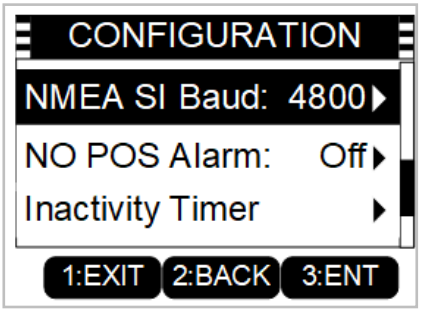
The deviation of UTC time can be adjusted between -14:00 and 14:00, press up/down key to change +/-. Press F key to start the value adjustment, and the step value of the adjustment is 1 minute by pressing up/down key.

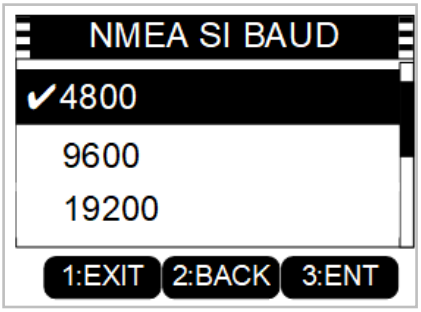




- **NMEA SI Baud**

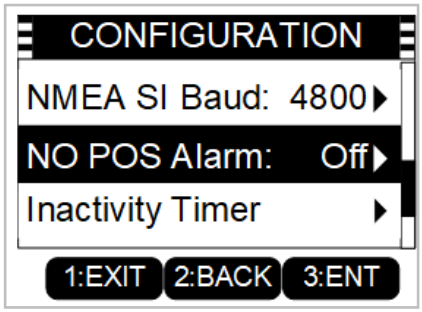
You can choose to set the following baud rates: 4800, 9600, 19200, 38400, 57600, 115200.

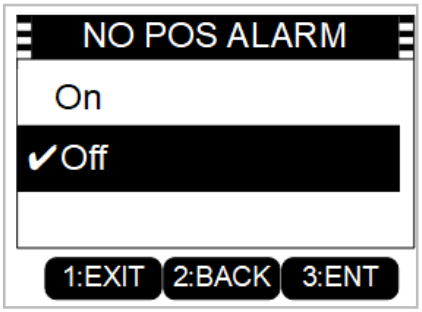




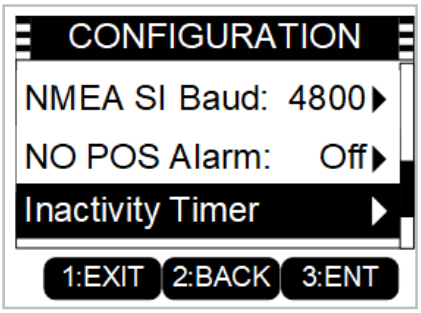
- **No POS Alarm**

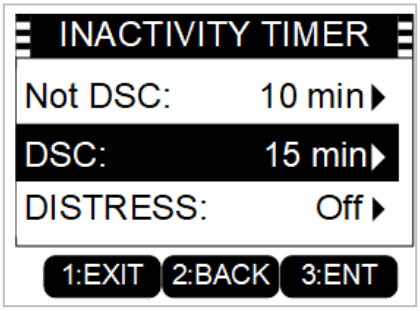
You can set whether to send out an alarm when there is no position information.





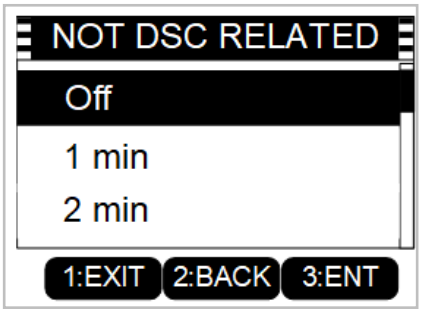
- **Inactivity Timer**





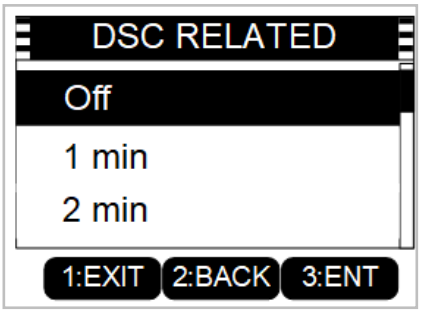
· **Not DSC (Default: 10 min)**

Set the display time that has nothing to do with the DSC interface.



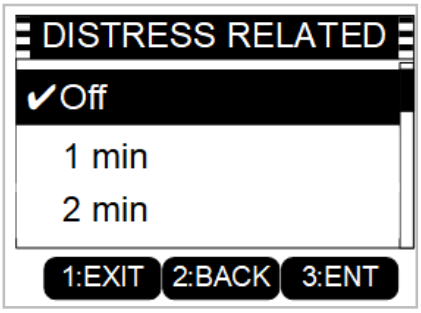
· **DSC (Default: 15 min)**

Set the time when the interface related to DSC is displayed.



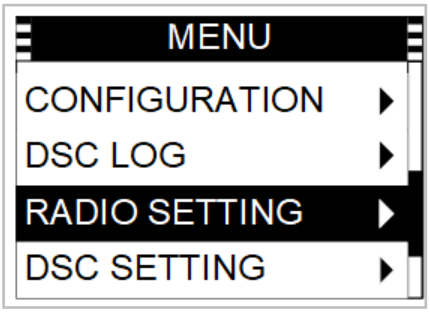
·**Distress (Default: Off)**

Set the time at which the interface related to distress calls is displayed.



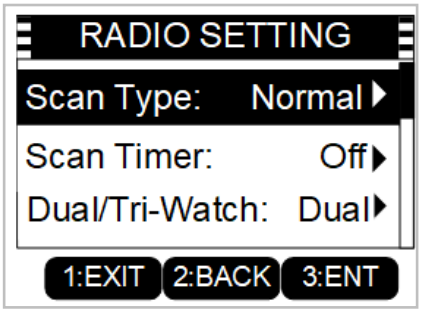
6.3 RADIO SETTING

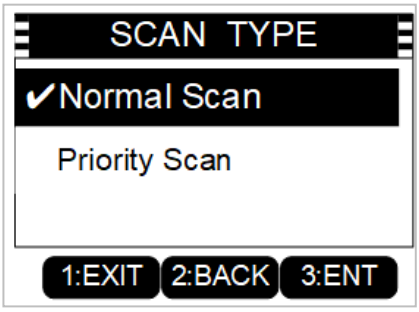
[RADIO SETTING] window includes **[Scan Type]**, **[Scan Timer]**, **[Dual/Tri-Watch]**, **[Channel Group]**, **[Call Channel]**, **[WX Alert]**, **[TAG Setting]**, **[TAG on MIC]** and **[CH Display]** settings.



- **Scan Type**

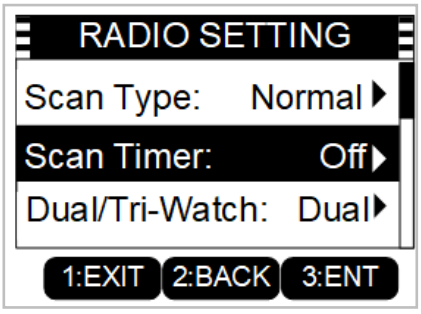
Channel Scan is an efficient way to locate signals quickly over a wide frequency range. There are two scan types: normal scan and priority scan. Normal scan searches for all marked channels in the selected channel group. Priority scanning is the insertion of scan 16 channels during the normal scanning process.

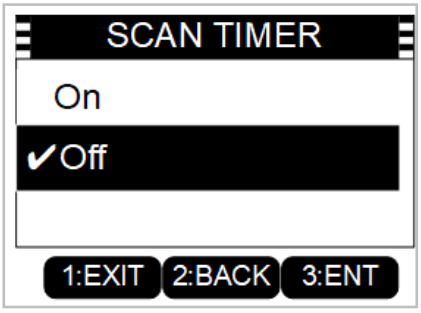




- **Scan Timer**

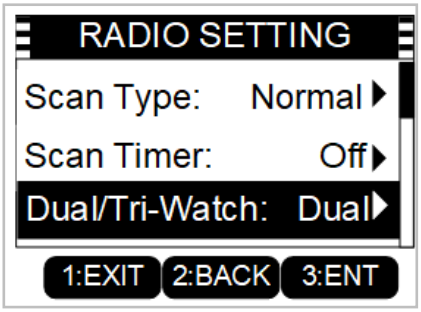
The scan timer can be off or on. When **Off** is selected, the scan pauses until the signal disappears. When **On** is selected, the scan pauses for 5 seconds and resumes even if it is not on channel 16.

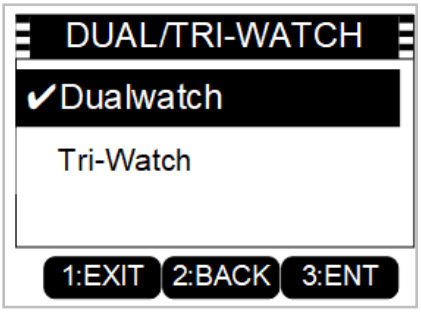




- **Dual/Tri-Watch**

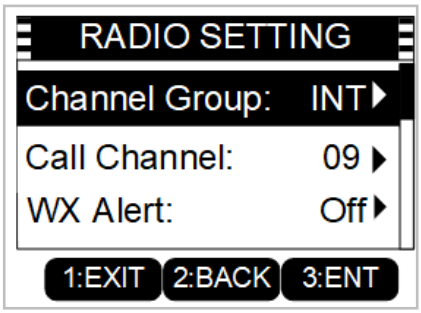
This function can choose dual frequency watch or triple frequency watch.

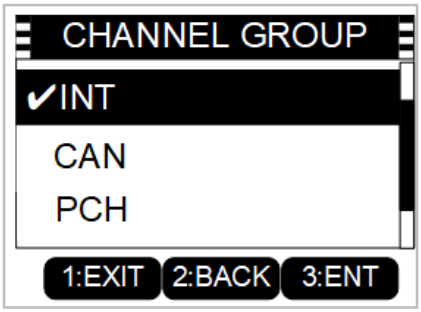




- **Channel Group**

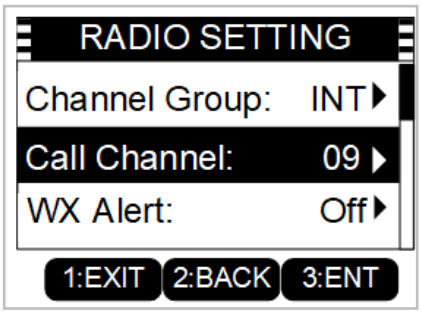
The Operating Channels include ITU, USA, CAN, etc. You can select the channel group according to the working area of the machine.





- **Call Channel**

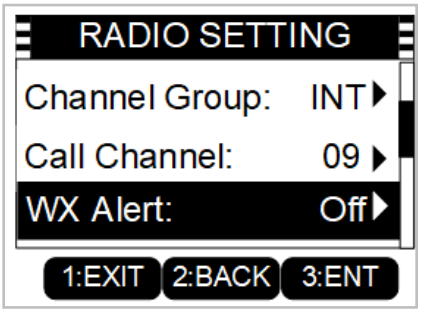
This function can set the desired call channel.

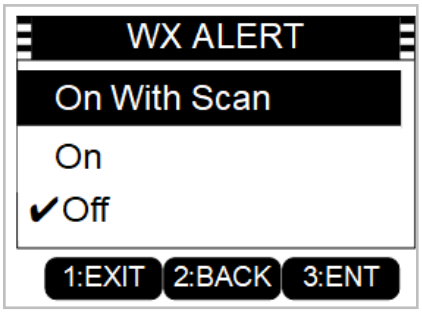


- **WX Alert**

When there is important weather information, NOAA broadcasting stations will emit weather warning sounds. When the weather alarm function is turned on, the intercom will sound an alarm tone when it receives an alarm, and the "WX" symbol flashes. During the scan, the weather channel currently in use will be scanned. When this function is enabled, the WX symbol is displayed.

· **On With Scan**: During scanning, pre-set weather channels are detected in sequence.
· **On**: During the scan, detect the last weather channel used.
· **Off**: This unit does not detect the weather channel alarm tone.

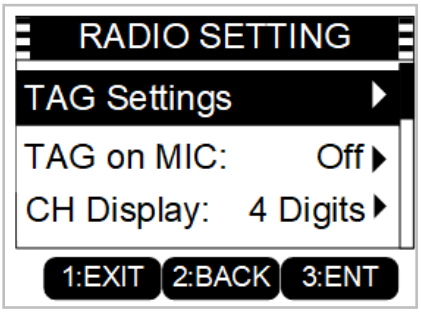


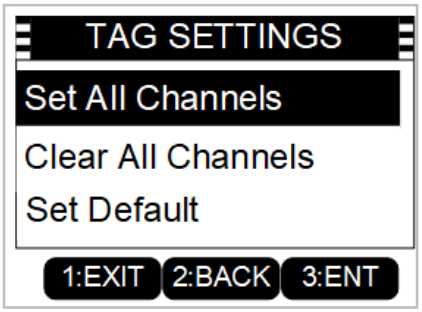


- **TAG Setting**

This unit can set all channels as tagged channels, cancel all tagged channels, and reset to the default tagged channels. By default, certain channels are preset.

· **Set All Channel**: Set all channels as tagged channels.
· **Clear All Channel**: Untag all channels.
· **Set Default**: Resets the tagged channel to the default tagged channel.

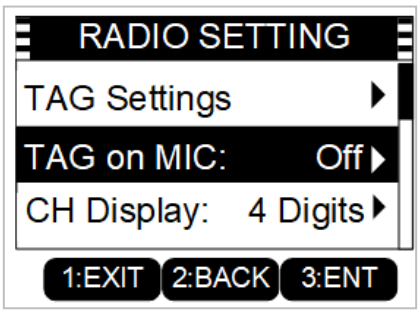


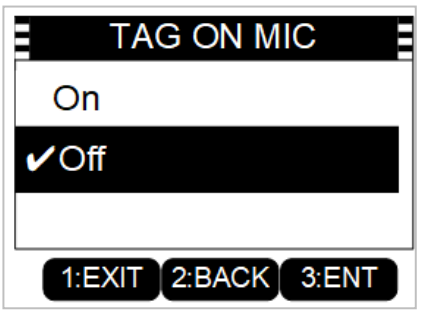


Select one of the items and press ENT key, the right information appears, press "1" to confirm the setting, press "3" to cancel the setting.

- **TAG on MIC**

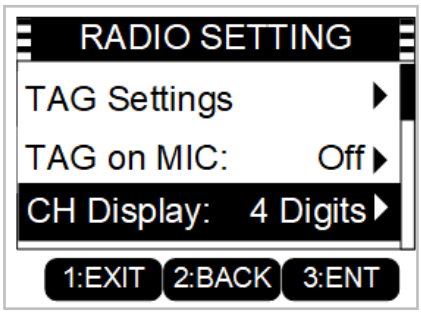
This function allows you to set whether to mark the channel on the phone. **Off** indicates that the function is disabled, and **On** indicates that the function is enabled.

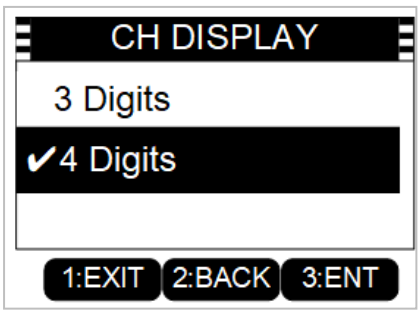




- **CH Display**

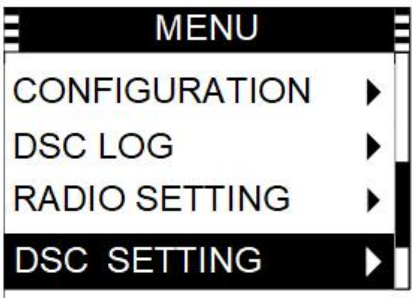
NVR-2000 supports to display of 3-digit channel numbers and 4-digit channel numbers.





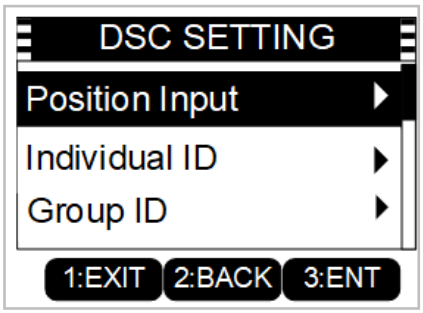
6.4 DSC SETTING

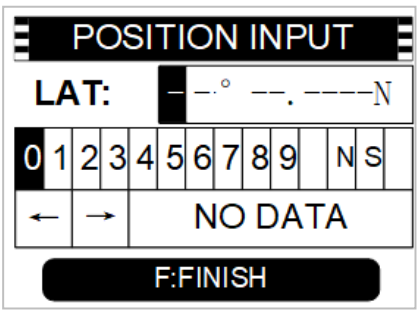
[DSC SETTING] window includes settings of **[Position Input]**, **[Individual ID]**, **[Group ID]**, **[Auto ACK]**, **[Medical Transport]**, **[Ships And Aircraft]**, **[CH Auto SWITCH]**, **[Alarm Status]**, **[CH 70 SQL Level]** and **[Self-Test]**.



- **Position Input**

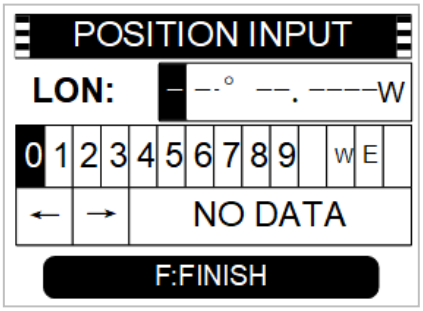
If a built-in GNSS receiver is available, the current position will be updated automatically. But if it doesn't work or the GNSS data is not available, position data should be entered manually. Input the current position manually in the same way with the time setting.





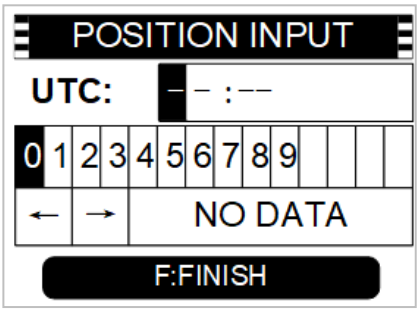
① Press ▲ or ▼ key to edit longitude and latitude.

② After entering the ship position information, press **F:FINISH** to confirm.



③ On the UTC time editing screen, enter the UTC time.

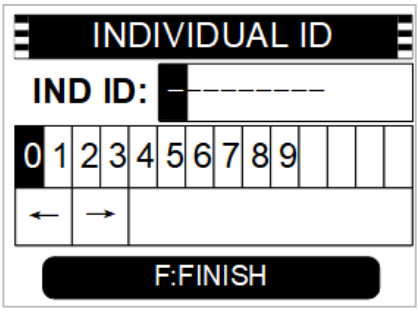
④ Press **F:FINISH** key to confirm.



- **Add/Edit Individual ID**

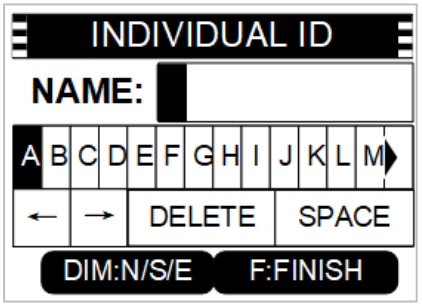
① Enter [INDIVIDUAL ID] menu.

② Press **1:ADD** to enter the Individual ID editing screen.

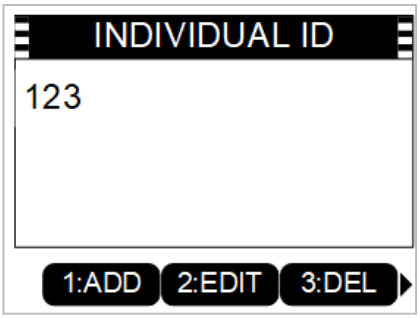


③ Enter the 9-digit ID code and press **F:FINISH** to enter the ID name editing screen.

④ After entering the ID name, press **F:FINISH** and return to the previous screen.



You can also press ▲ or ▼ key to select the ID name, then press **2:EDIT** to edit the Individual ID, the operation is similar to the above.

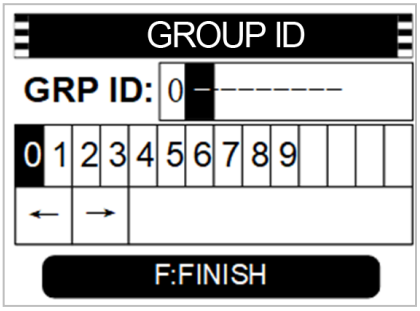


- **Add/Edit Group ID**

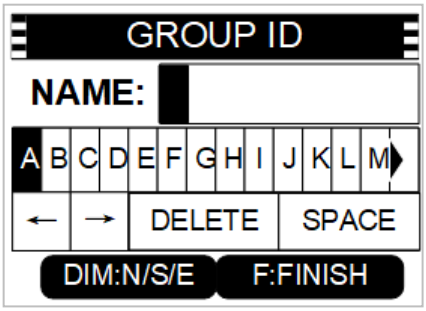
① Enter [GROUP ID] menu.

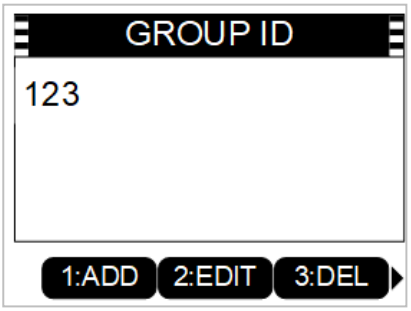
② Press **1:ADD** to enter the Group ID editing screen.

③ Enter the 9-digit ID code and press **F:FINISH** to enter the ID name editing screen.



④ After enter the ID name, press **F:FINISH** and return to the previous screen.



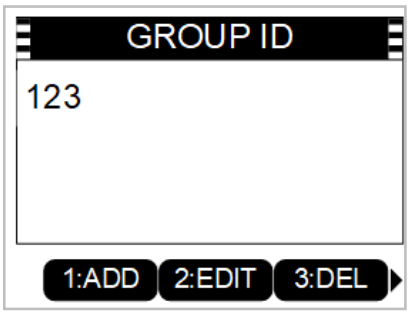


You can also press ▲ or ▼ key to select the ID name, then press **2:EDIT** to edit the Group ID, the operation is similar to the above.

- **Delete Individual ID/Group ID**

① Enter [INDIVIDUAL ID] or [GROUP ID] menu. For example, [GROUP ID]:

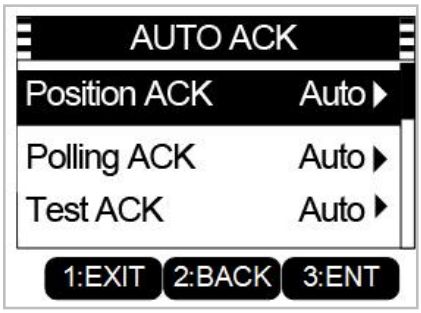
② Press ▲ or ▼ key to select the ID name, then press **3:DEL**.

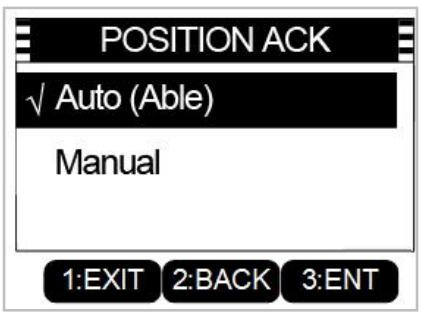


③ A notice appears, press **1:OK** to finish the operation.

- **Auto ACK**

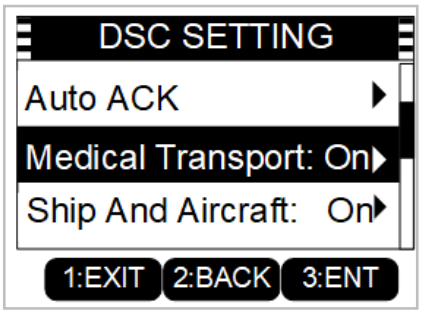
If "**Auto**" is set, the equipment will respond to the test message, position request message, polling message and individual message automatically. For example, **Auto (Able)**: automatically send the ABLE replay.

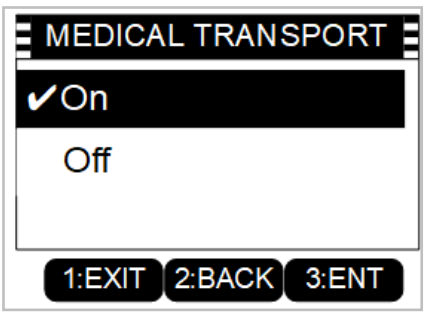




- **Medical Transport**

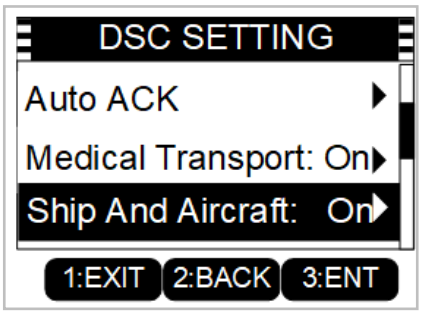
[Medical Transport] can be set as "**On**" or **"Off".** If "**On**" is set, this type is to be selected (for transmitting MEDICAL MSG).

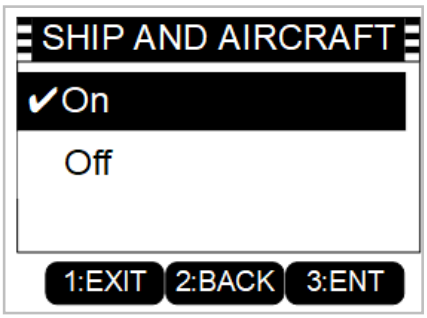




- **Ships and Aircraft**

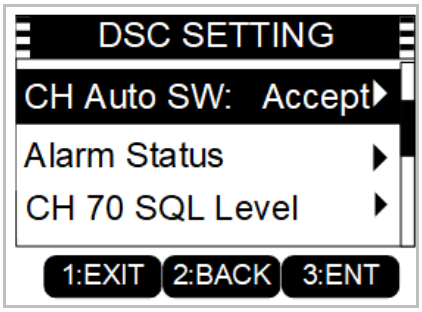
[Ships And Aircraft] can be set as "**On**" or **"Off".** If "**On**" is set, this type is to be selected (for transmitting NEUTRAL MSG).

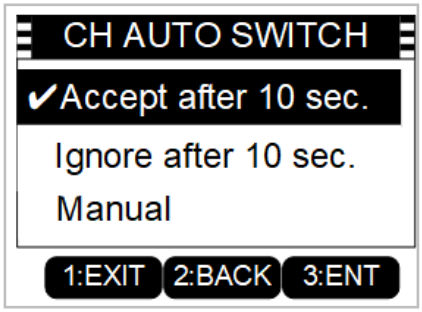




- **CH Auto Switch**

[CH Auto SW] can be set among "**Accept after 10 sec**", "**Ignore after 10 sec**" and "**Manual**".





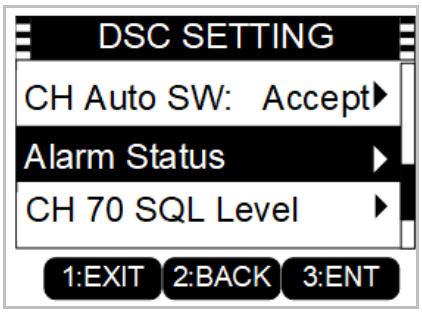
Accept after 10 sec: After receiving a DSC call, NVR-2000 remains on the working channel for 10 seconds before automatically change to the channel specified in the DSC call.

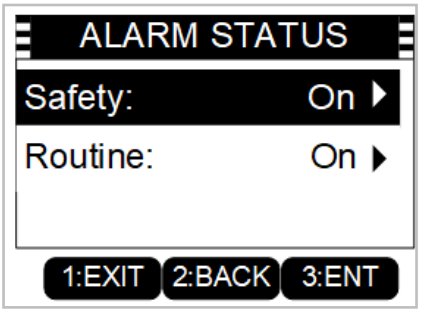
Ignore after 10 sec: After receiving a DSC call, if not accepted within 10 seconds, the call is ignored and NVR-2000 remains on the current working channel.

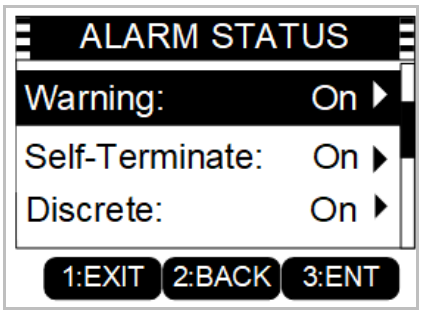
Manual: After receiving a DSC call, you should manually select whether to accept the call.

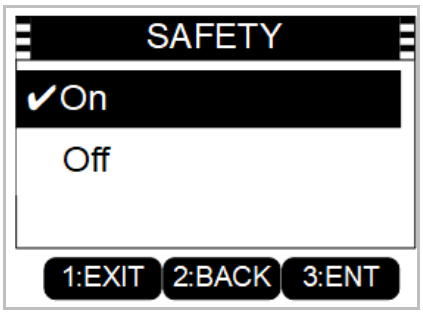
- **Alarm Status**

If "**On**" is set, there will be an alarm while receiving a DSC message, etc. For example:









Safety: The audio alarm sounds when receiving a DSC safety call.

Routine: The audio alarm sounds when receiving a DSC routine call.

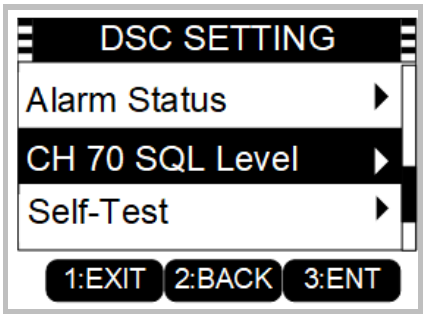
Warning: The audio alarm sounds when situations occur such as no MMSI, missing position information etc.

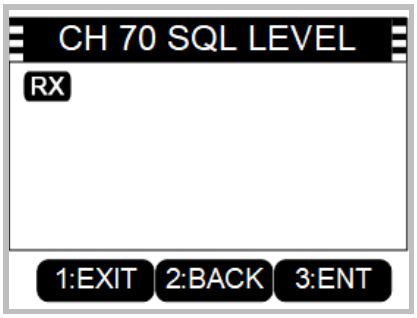
Self-Terminate: The audio alarm sounds when receiving duplicate DSC calls.

Discrete: The audio alarm sounds when a high-priority DSC call is received simultaneously with a low-priority DSC call.

- **CH 70 SQL Level**

Press ENT key to check the response of the SQL knob: turn the knob and "RX" appears.

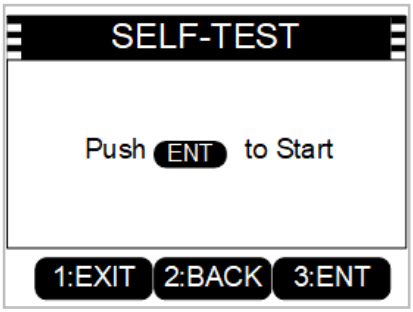


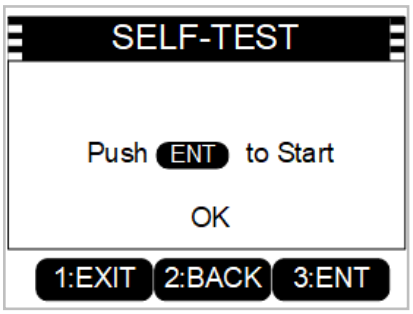


- **Self-Test**

Press ENT key to start the DSC self-test. The result will be displayed after testing.

When the transmitted DSC and received DSC signals match, OK is displayed. If the result is not OK, please contact NSR agent.

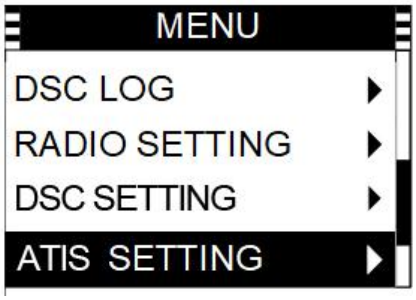


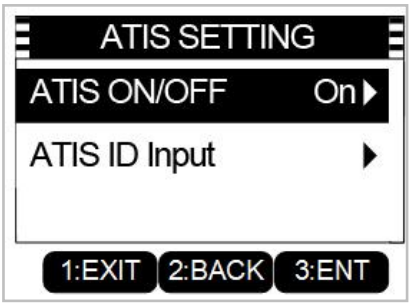


6.5 ATIS SETTING

[ATIS SETTING] window includes the following settings:

- **ATIS ON/OFF**

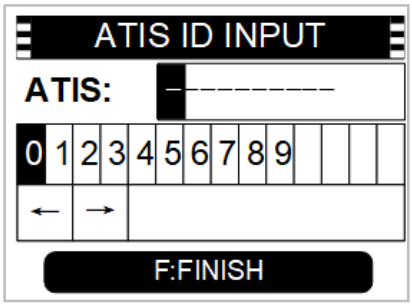




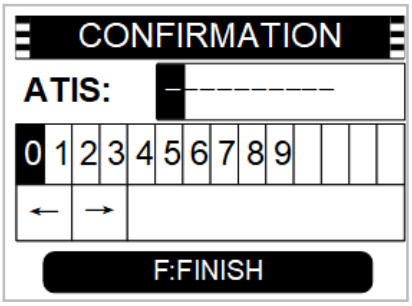
- **ATIS ID Input**

① Press ▲ or ▼ key to select [ATIS ID Input], then press ENT.

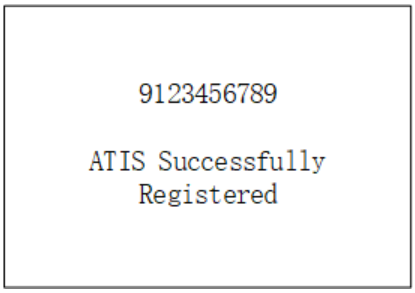
② Enter the ATIS ID.



③ Enter the ATIS ID again for confirmation.



④ Press **F:FINISH**, the ATIS ID setting succeeded.



7. DSC CALLS

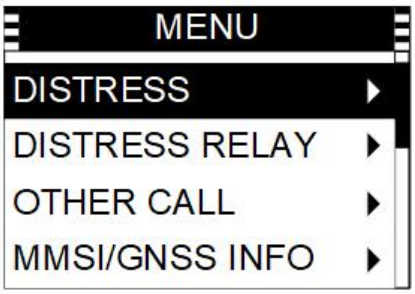
DSC (Digital Selective Calling) is an important means for emergency calls at sea. It's a part of GMDSS (Global Maritime Distress and Safety System) set by IMO (International Maritime Organization).

DSC should be primarily used for distress, urgent and safety call and response to such calls. In addition, it can be used for general service between ship-to-ship and ship-to-shore stations and if automatic service is provided by coastal stations for direct access to the shore-based public telephone network.

7.1 DSC OPERATION

F => SET 9 VWX

Press two keys in turn to enter the MENU screen as in the right figure. It includes **[DISTRESS]**, **[DISTRESS RELAY]**, **[OTHER CALL]** and **[DSC LOG]** items.



Note: F => DSC 7 PQR

Press "F" and then "7" key to **[OTHER DSC]** menu directly.

7.1.1 DISTRESS CALL

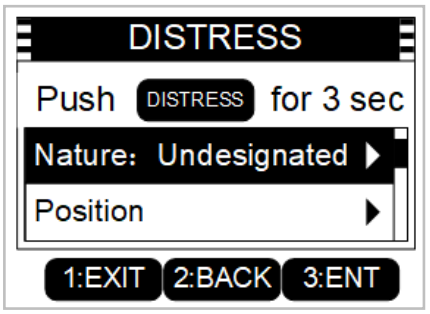
1) **Make a Distress Call**

There are two ways to make a distress call:

① Open the cover of DISTRESS key on the front panel of the equipment and press the button for about 3s.

② Send the call by using the menu. Select **DISTRESS** to enter the sub-menu as shown on the right.

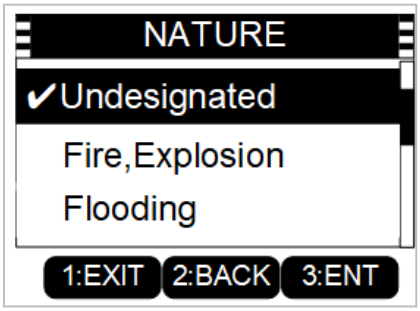
Enter the following items to make a distress call.



- Nature

Press ENT key to enter the distress nature selection screen.

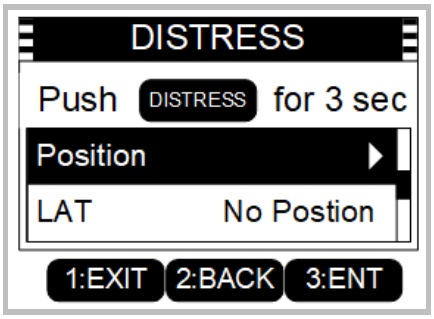
The nature of distress can be selected between: Undesignated, Fire/Explosion, Flooding, Collision, Grounding, Capsizing, Sinking, Adrift, Abandon Ship, Piracy, Man Overboard.

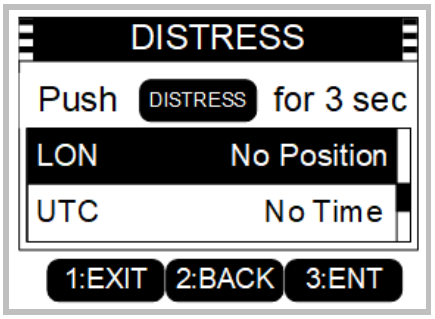


Press ▲ or ▼ key to select the nature of distress, then press ENT key.

- Position

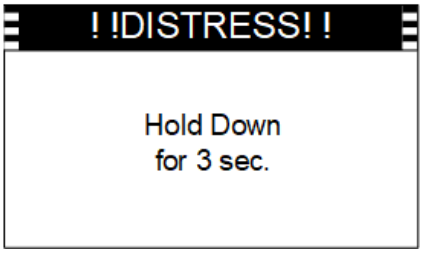
The position data is included in the message. When a built-in GNSS receiver is available, the position will be updated automatically, otherwise, manual input is required (Please refer to Section 6.4).

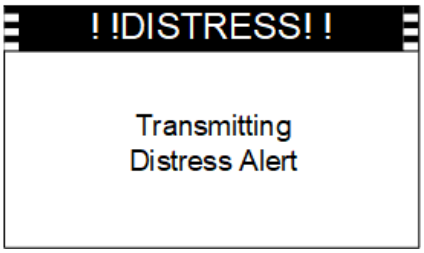




- Alert

Open the cover on the radio, hold the DISTRESS key for three seconds, then the distress call is sent to all vessels.



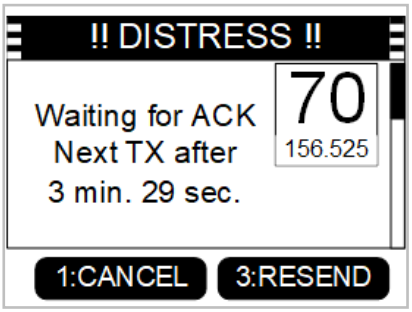


Note: When you press the DISTRESS key, the audio alarm sounds and the backlight flashes.

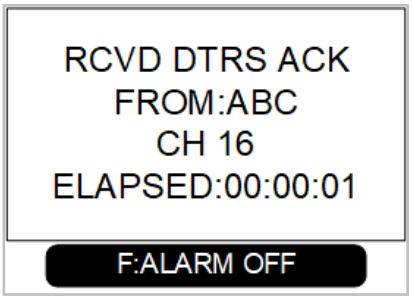
③ **Receive ACK**

After a distress call is transmitted, NVR-2000 waits to receive an acknowledgement.

Note: Every 3.5 to 4.5 minutes, distress calls are automatically transmitted until the acknowledgement is received (repeated call mode), or the DSC call is cancelled.



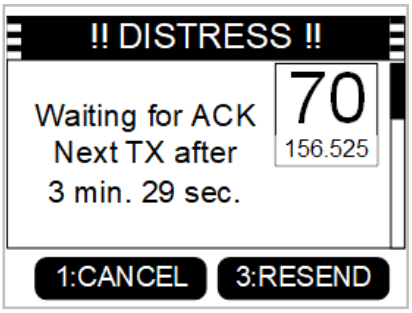
After receiving the acknowledgement, press **F:ALARM OFF** to turn off the alarm, and then press **PTT** key to reply, communicate with the coast station via radiotelephone.



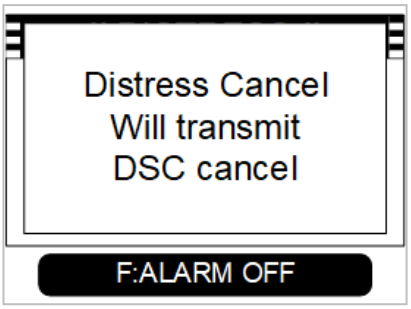
④ **Cancel a Distress call**

If a false distress call is transmitted, send a distress cancellation call to cancel the call as soon as possible while waiting for the acknowledgement, and the purpose of the cancellation should be reported.

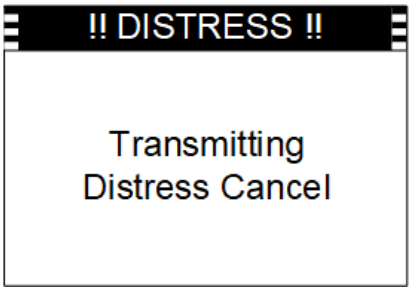
Press **1.CANCEL** while waiting for the acknowledgement to be confirmed.



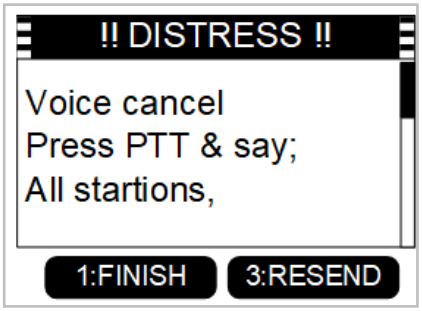
Press **F:ALARM OFF** to send a distress cancellation call.



Automatically select 16 channels to call.

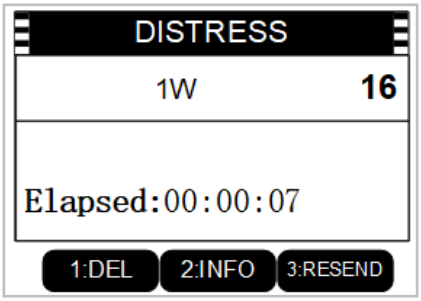


Press the **PTT** key to inform the purpose of cancelling the call (referring to the message on the screen).



After the communication, press **1.FINISH**.

Press **1.DEL** to complete the distress cancellation call and return to the main screen.



2) Receive Distress Calls

The operation methods for receiving a distress call are the same, including distress call, distress acknowledgement and distress cancellation. For example:

If a DSC distress call is received, the message is indicated on the LCD and stored automatically.

- Sound the emergency alarm until the alarm is turned off.
- "RCVD DISTRESS" is displayed, and the screen backlight is blinking.

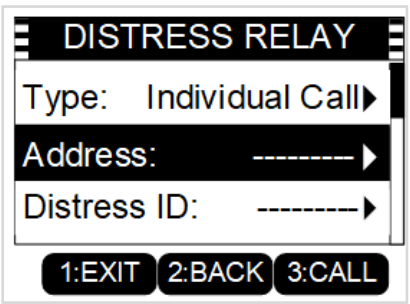
The message indicated in the LCD varies with the type of call.

Press **F:ALARM OFF** to turn off the alarm and flashing light.

Press the softkey to select the desired operation.

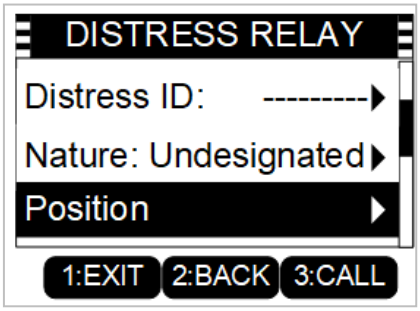
7.1.2 DISTRESS RELAY

1) **Make a Distress Relay Call**



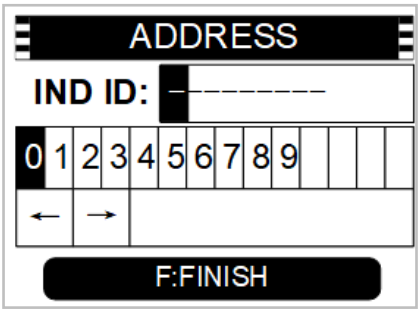
- RELAY-All Ships

It is to relay a distress call to all vessels.



- RELAY–Individual

It's to relay a distress call to a station. A particular MMSI is entered before sending the call.



2) Receive Distress Relay Calls

The operation methods for receiving a distress relay call are the same, including the distress relay call and the distress relay acknowledgement.

If the call is received, the message is indicated on the LCD and stored automatically.

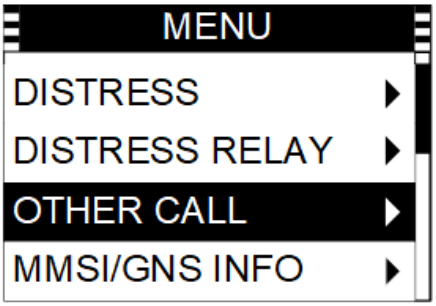
- Sound the emergency alarm until the alarm is turned off.
- "RCVD DISTRESS RELAY"/"RCVD DIST RELAY ACK" is displayed, and the screen backlight is blinking.

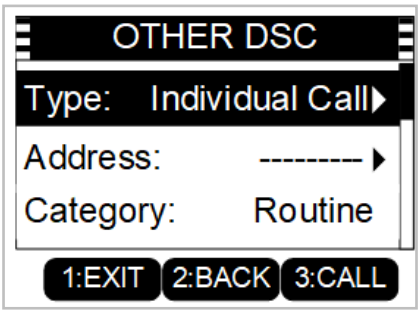
The message indicated in the LCD varies with the type of call.

Press **F:ALARM OFF** to turn off the alarm and flashing light.

Press the softkey to select the desired operation.

7.1.3 OTHER DSC



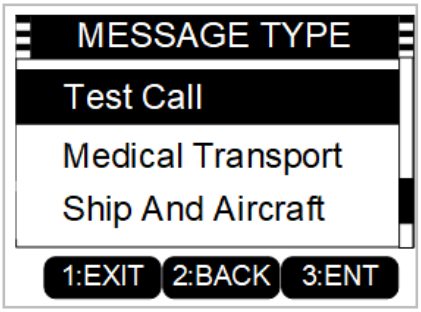


Type	Category
Individual Call	Routine
All Ships Call	Safety/Urgency
Group Call	Routine
Position Request	Safety
Position Report	Routine/Safety/Urgency
Polling Request	Routine
Test Call	Safety
Medical Transport	Routine/Safety/Urgency
Ships and Aircraft	Routine/Safety/Urgency
Geog Area Call	Routine/Safety/Urgency

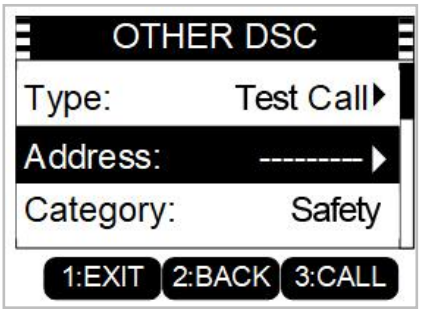
For example:

- Send Test Call

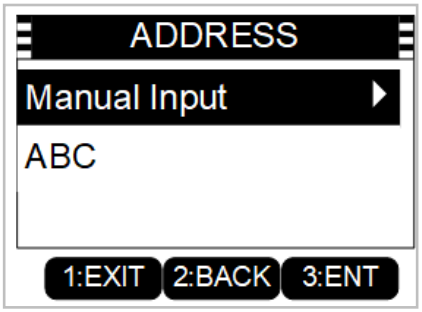
① Press ENT key to enter [Test Call] screen.



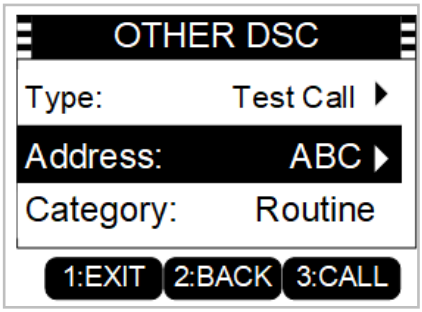
② Select “Address”, then press ENT key to enter “ADDRESS” display screen.

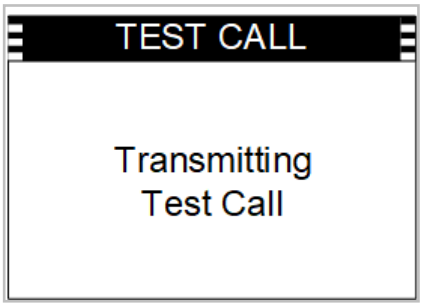


③ Select the station MMSI you want to send and press ENT key.



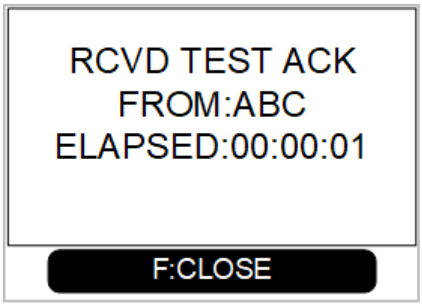
④ Press 3:CALL to transmit a test call, the screen displays “Transmitting Test Call”.





⑤ Wait for the acknowledgement after the call is transmitted.

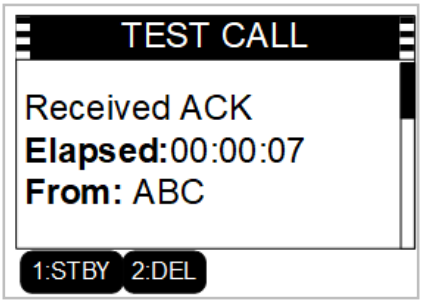
⑥ After receiving the acknowledgement, the alarm tone is issued, and the screen displays the received notice.



⑦ Press **F:ALARM OFF** to turn off the alarm.

Press **F:CLOSE** to view the details.

⑧ Press **1:STBY** to return to normal working mode.



- Receive Test Call

Because NVR-2000 has the automatic acknowledge function, when the test call is received, it automatically sends the acknowledgement to the main calling station.

When a test call is received:

- Alarm sounds for two minutes.
- "RCVD TEST CALL" is displayed on the LCD and the message is stored automatically.

Press **ALARM OFF** to turn off the alarm.

Press the soft key to select the desired operation.

If the "Auto ACK" function is set to "Manual", the operation method of manually transmitting the test acknowledgement is as follows:

① After receiving the test call, press **F:ALARM OFF** to turn off the alarm.

② Press **ACPT**, and the screen displays the received call information.

③ Press **ACK**, and the screen displays the "Test ACK" window.

④ Press **CALL** to send a test call acknowledgement.

⑤ Press **STBY** to return to the normal working mode.

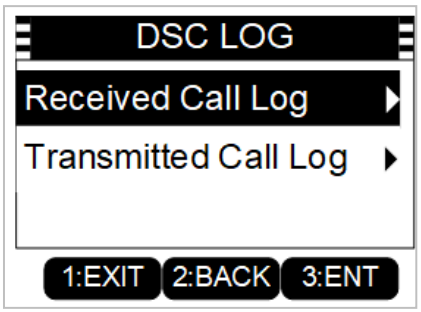
The operation of other calls is similar to Test Call.

7.2 DSC LOG

You can check both transmitted calls and received calls in the [DSC LOG] menu.

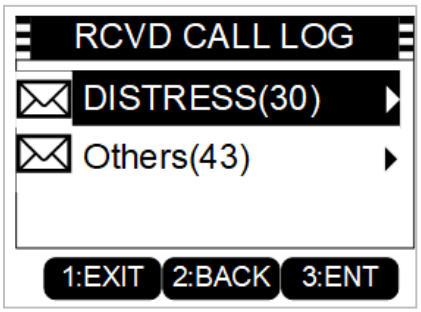
7.2.1 RECEIVED DSC LOG

① Press ▲ or ▼ key to select **[DSC LOG]** in the menu, then press ENT key, the **[DSC LOG]** screen appears.

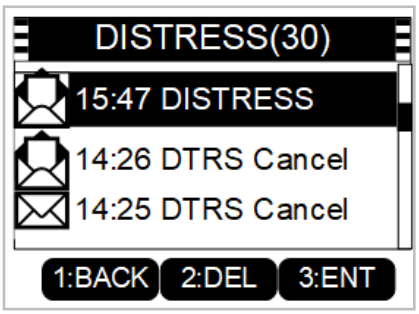


② Press ▲ or ▼ key to select "Received Call Log", then press ENT key to enter the **[RCVD CALL LOG]** screen.

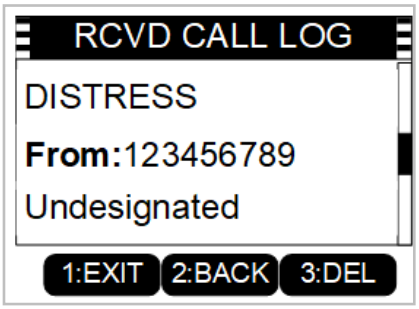
③ Press ▲ or ▼ key to select "Distress" or "Others", then press ENT key to enter the corresponding screen.



④ Press ▲ or ▼ key to search record.

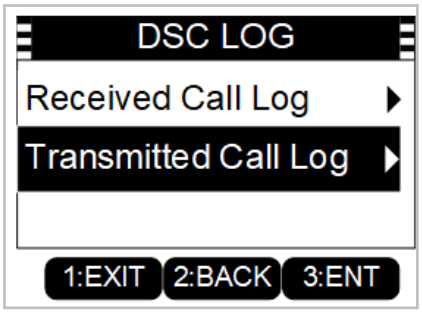


⑤ Press ENT key to display information about received calls.

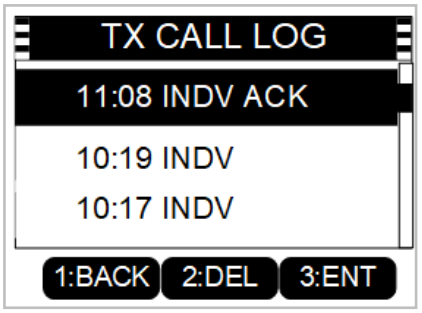


7.2.2 TRANSMITTED DSC LOG

① Press ▲ or ▼ key to select [DSC LOG] in the menu, then press ENT key, the [DSC LOG] screen appears.

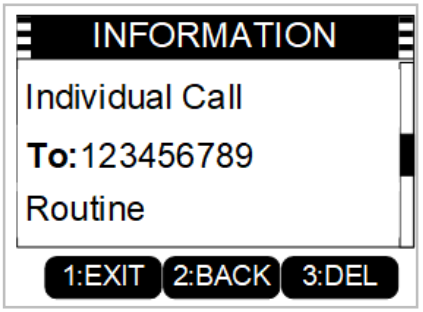


② Press ▲ or ▼ key to select "Transmitted Call Log", then press ENT key to enter the **[TX CALL LOG]** screen.



③ Press ▲ or ▼ to search record.

④ Press ENT key to display information about transmitted calls.



8. INSTALLATION

8.1 VHF ANTENNA INSTALLATION

There is one VHF antenna to be connected. Install the VHF antenna by referring to the antenna installation diagram at the end of this manual.

It's very important to choose a proper location for the VHF antenna as a metal object close to the antenna could affect receiving sensitivity.

The following instructions are helpful:

- The antenna should be kept at least 0.5m from a vertical metal object to avoid RF reflection.
- The antenna should be kept at least 3m from other high-power radiators, such as the radar antenna.
- Two VHF antennas should not be installed at the same height. The new VHF antenna can be installed either under or above the existing VHF antenna. The distance between should be more than 2.8m. If two antennas have to be installed at the same height, the distance between them should be more than 10m.

For the cabling, please refer to the suggestions below:

- The shorter the cable, the less the loss. The low-loss cable is recommended if the cable is longer than 10m.
- Watertight treatment is required for outdoor connecting.
- The RF cable should be kept at least 10cm from the power cable. The cable cross should be avoided.

8.2 GNSS ANTENNA INSTALLATION

Install the GNSS antenna by referring to the antenna installation diagram at the end of this manual. When selecting a mounting location for the antenna unit, keep in mind the following points:

- Do not cut the antenna cable.
- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GNSS signal.
- The location should be well away from a VHF/UHF antenna. A GNSS receiver is interfered with by a harmonic wave of a VHF/ UHF antenna.
- There should be no obstruction within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mounting the antenna as high as possible keeps it free from interfering objects and water spray, which can interrupt the reception of the GNSS satellite signal if the water freezes.
- If the antenna cable is to be passed through a hole that is not large enough to pass the connector, you may unfasten the connector. Refasten it after running the cable through the hole.

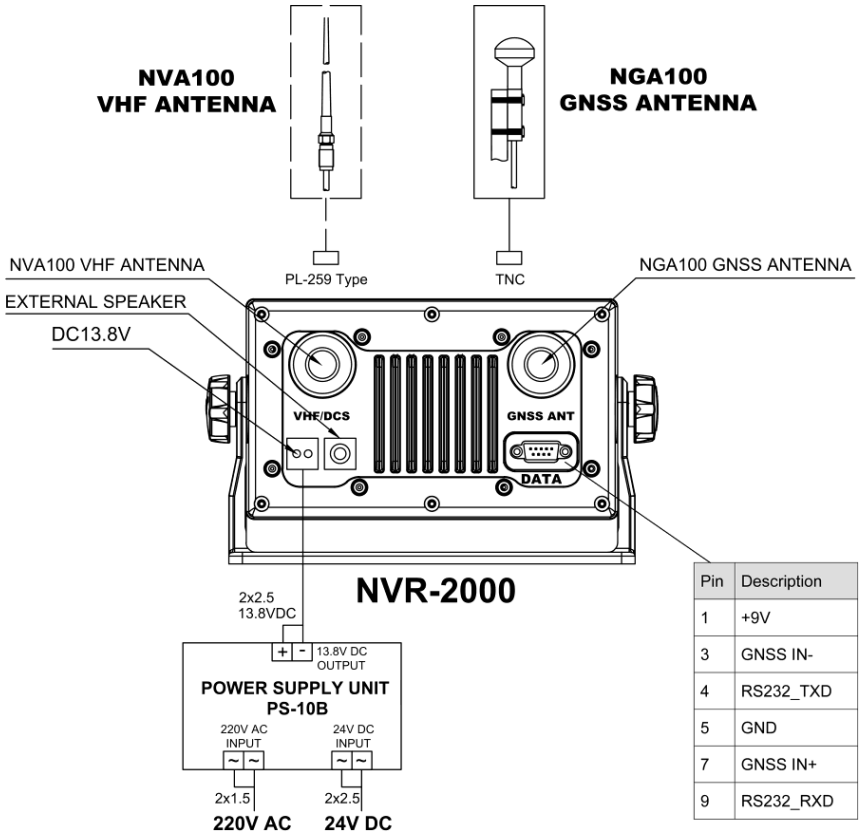
8.3 TRANSCEIVER INSTALLATION

Four screws are supplied to mount the transceiver. The transceiver can be installed either on the table or on the wall.
Care must be taken when mounting the transceiver to ensure that there is sufficient space for cables and connectors. Especially, sharp bending of the RF cable must be avoided.
Observe the compass safe distances to prevent deviation of a magnetic compass.

8.4 POWER SUPPLY CONNECTION

The power cable with a rated capacity of 10A should be used. Suggest using the 10A DC Power Supply Unit (DC13.8V output).

8.5 PORT DEFINITION



Pin	Description
1	+9V
3	GNSS IN-
4	RS232_TXD
5	GND
7	GNSS IN+
9	RS232_RXD

GNSS IN: GNSS data input, the format should be NMEA0183/4800bps.

Appendix I. CHANNEL TABLE

ITU VHF Channel Table (REV.WRC-19 Appendix18)

Channel designator	Notes	Transmitting frequencies (MHz)		Inter- ship	Port operations and ship movement		Public corres-pondence
		From ship stations	From coast stations		Single frequency	Two frequency	
60	*m)*	156.025	160.625		x	x	x
01	*m)*	156.050	160.650		x	x	x
61	*m)*	156.075	160.675		x	x	x
02	*m)*	156.100	160.700		x	x	x
62	*m)*	156.125	160.725		x	x	x
03	*m)*	156.150	160.750		x	x	x
63	*m)*	156.175	160.775		x	x	x
04	*m)*	156.200	160.800		x	x	x
64	*m)*	156.225	160.825		x	x	x
05	*m)*	156.250	160.850		x	x	x
65	*m)*	156.275	160.875		x	x	x
06	*f)*	156.300		x			
2006	*r)*	160.900	160.900				
66	*m)*	156.325	160.925		x	x	x
07	*m)*	156.350	160.950		x	x	x
67	*h)*	156.375	156.375	x	x		
08		156.400		x			
68		156.425	156.425		x		
09	*i)*	156.450	156.450	x	x		
69		156.475	156.475	x	x		
10	*h), q)*	156.500	156.500	x	x		
70	*f), j)*	156.525	156.525	Digital selective calling for distress, safety and calling			
11	*q)*	156.550	156.550		x		
71		156.575	156.575		x		
12		156.600	156.600		x		
72	*i)*	156.625		x			
13	*k)*	156.650	156.650	x	x		
73	*h), i)*	156.675	156.675	x	x		
14		156.700	156.700		x		
74		156.725	156.725		x		
15	*g)*	156.750	156.750	x	x		
75	*n), s)*	156.775	156.775		x		
16	*f)*	156.800	156.800	DISTRESS, SAFETY AND CALLING			
76	*n), s)*	156.825	156.825		x		
17	*g)*	156.850	156.850	x	x		
77		156.875		x			
18	*m)*	156.900	161.500		x	x	x
78	*m)*	156.925	161.525		x	x	x
1078		156.925	156.925		x		
2078	*mm)*		161.525		x		
19	*m)*	156.950	161.550		x	x	x

Channel designator	Notes	Transmitting frequencies (MHz)		Inter- ship	Port operations and ship movement		Public corres-pondence
		From ship stations	From coast stations		Single frequency	Two frequency	
1019		156.950	156.950		x		
2019	*mm)*		161.550		x		
79	*m)*	156.975	161.575		x	x	x
1079		156.975	156.975		x		
2079	*mm)*		161.575		x		
20	*m)*	157.000	161.600		x	x	x
1020		157.000	157.000		x		
2020	*mm)*		161.600		x		
80	*y), wa)*	157.025	161.625		x	x	x
21	*y), wa)*	157.050	161.650		x	x	x
81	*y), wa)*	157.075	161.675		x	x	x
22	*y), wa)*	157.100	161.700		x	x	x
82	*x), y), wa)*	157.125	161.725		x	x	x
23	*x), y), wa)*	157.150	161.750		x	x	x
83	*x), y), wa)*	157.175	161.775		x	x	x
24	*w), x)*	157.200	161.800		x	x	x
1024	*w)*	157.200	157.200	x (digital only)	x (digital only)		
2024	*w)*	161.800	161.800	x (digital only)	x (digital only)		
84	*w), x)*	157.225	161.825		x	x	x
1084	*w)*	157.225	157.225	x (digital only)	x (digital only)		
2084	*w)*	161.825	161.825	x (digital only)	x (digital only)		
25	*w), x)*	157.250	161.850		x	x	x
1025	*w)*	157.250	157.250	x (digital only)	x (digital only)		
2025	*w)*	161.850	161.850	x (digital only)	x (digital only)		
85	*w), x)*	157.275	161.875		x	x	x
1085	*w)*	157.275	157.275	x (digital only)	x (digital only)		
2085	*w)*	161.875	161.875	x (digital only)	x (digital only)		
26	*w), x)*	157.300	161.900		x	x	x
1026	*w)*	157.300					
2026	*w)*		161.900				
86	*w), x)*	157.325	161.925		x	x	x
1086	*w)*	157.325					
2086	*w)*		161.925				
1027	*zz)*	157.350	157.350		x		
ASM 1	*z)*	161.950	161.950				
87	*zz)*	157.375	157.375		x		
1028	*zz)*	157.400	157.400		x		
ASM 2	*z)*	162.000	162.000				
88	*zz)*	157.425	157.425		x		
AIS 1	*f), l), p)*	161.975	161.975				
AIS 2	*f), l), p)*	162.025	162.025				

Notes referring to the Table

General notes

a) Administrations may designate frequencies in the inter-ship, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations under the conditions specified in Nos. **51.69**, **51.73**, **51.74**, **51.75**, **51.76**, **51.77** and **51.78**. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.

b) The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.

c) The channels of the present Appendix, with the exception of channels 06, 13, 15, 16, 17, 70, 75 and 76, may be used for direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations. (WRC-12)

d) The frequencies in this table may also be used for radiocommunications on inland waterways in accordance with the conditions specified in No. **5.226**.

e) Administrations may apply 12.5 kHz channel interleaving on a non-interference basis to 25 kHz channels, in accordance with the most recent version of Recommendation ITU-R M.1084, provided:

- it shall not affect the 25 kHz channels of the present Appendix maritime mobile distress and safety, automatic identification system (AIS), and data exchange frequencies, especially the channels 06, 13, 15, 16, 17, 70, AIS 1 and AIS 2, nor the technical characteristics set forth in Recommendation ITU-R M.489-2 for those channels;
- implementation of 12.5 kHz channel interleaving and consequential national requirements shall be subject to coordination with affected administrations. (WRC-12)

Specific notes

f) The frequencies 156.300 MHz (channel 06), 156.525 MHz (channel 70), 156.800 MHz (channel 16), 161.975 MHz (AIS 1) and 162.025 MHz (AIS 2) may also be used by aircraft stations for the purpose of search and rescue operations and other safety-related communication. The frequencies 156.525 MHz (channel 70), 161.975 MHz (AIS 1) and 162.025 MHz (AIS 2) may also be used by autonomous maritime radio devices Group A that enhance the safety of navigation, using digital selective calling and/or AIS technology. Such use should be in accordance with the most recent version of Recommendation ITU-R M.2135. (WRC-19)

g) Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters.

h) Within the European Maritime Area and in Canada, these frequencies (channels 10, 67, 73) may also be used, if so required, by the individual administrations concerned, for communication between ship stations, aircraft stations and participating land stations

engaged in coordinated search and rescue and anti-pollution operations in local areas, under the conditions specified in Nos. **51.69**, **51.73**, **51.74**, **51.75**, **51.76**, **51.77** and **51.78**.

i) The preferred first three frequencies for the purpose indicated in Note a) are 156.450 MHz (channel 09), 156.625 MHz (channel 72) and 156.675 MHz (channel 73).

j) Channel 70 is to be used exclusively for digital selective calling for distress, safety and calling.

k) Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications. It may also be used for the ship movement and port operations service subject to the national regulations of the administrations concerned.

l) These channels (AIS 1 and AIS 2) are used for an automatic identification system (AIS) capable of providing worldwide operation, unless other frequencies are designated on a regional basis for this purpose. Such use should be in accordance with the most recent version of Recommendation ITU-R M.1371. (WRC-07)

m) These channels may be operated as single frequency channels, subject to coordination with affected administrations. The following conditions apply for single frequency usage:

- The lower frequency portion of these channels may be operated as single frequency channels by ship and coast stations.
- Transmission using the upper frequency portion of these channels is limited to coast stations.
- If permitted by administrations and specified by national regulations, the upper frequency portion of these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, ASM 1 and ASM 2. (WRC-19)

mm) Transmission on these channels is limited to coast stations. If permitted by administrations and specified by national regulations, these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, ASM 1 and ASM 2. (WRC-19)

n) With the exception of AIS, the use of these channels (75 and 76) should be restricted to navigation-related communications only and all precautions should be taken to avoid harmful interference to channel 16, by limiting the output power to 1 W. (WRC-12)

o) (SUP - WRC-12)

p) Additionally, AIS 1 and AIS 2 may be used by the mobile-satellite service (Earth-to-space) for the reception of AIS transmissions from ships. (WRC-07)

q) When using these channels (10 and 11), all precautions should be taken to avoid harmful interference to channel 70. (WRC-07)

r) In the maritime mobile service, the frequency 160.9 MHz (channel 2006) is designated for autonomous maritime radio devices Group B that do not enhance the safety of navigation, using AIS technology, in accordance with the most recent version of Recommendation ITU-R M.2135. Autonomous maritime radio devices Group B are limited to a transmitter e.i.r.p. of 100 mW and an antenna height not exceeding 1 m above the surface of the sea.

In the maritime mobile service, this frequency may also be used for experimental use for future applications or systems (e.g. new AIS applications, man over board systems, etc.).

If authorized by administrations for experimental use, the operation shall not cause harmful interference to, or claim protection from, stations operating in the fixed and mobile services, including the use of autonomous maritime radio devices Group B. (WRC-19)

s) Channels 75 and 76 are also allocated to the mobile-satellite service (Earth-to-space) for the reception of long- range AIS broadcast messages from ships (Message 27; see the most recent version of Recommendation ITU-R M.1371). (WRC-12)

t) (SUP – WRC-15)

u) (SUP – WRC-15)

v) (SUP – WRC-15)

w) The frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz (corresponding to channels: 24, 84, 25, 85, 26, 86, 1024, 1084, 1025, 1085, 1026, 1086, 2024, 2084, 2025, 2085, 2026 and 2086) are identified for the utilization of the VHF Data Exchange System (VDES). The VDES terrestrial and satellite components are described in the most recent version of Recommendation ITU-R M.2092. These channels shall not be used for feeder links. The channels may be merged using multiple 25 kHz contiguous channels to form channel bandwidths of 50, 100 or 150 kHz. The channel usage is shown below:

– The channels 1024, 1084, 1025 and 1085 are identified for ship-to-shore, shore-to-ship and ship-to-ship communications, but ship-to-satellite and satellite-to-ship communications may be possible without imposing constraints on ship-to-shore, shore-to-ship and ship-to-ship communications.

– The channels 2024, 2084, 2025 and 2085 are identified for shore-to-ship and ship-to-ship communications, but ship-to-satellite and satellite-to-ship communications may be possible without imposing constraints on shore- to-ship and ship-to-ship communications.

– The channels 1026, 1086, 2026 and 2086 are identified for ship-to-satellite and satellite-to-ship communications and are not used by the terrestrial component of VDES.

– The channels 24, 84, 25 and 85 are identified for ship-to-shore and shore-to-ship communications.

The Earth-to-space component of the VDES shall not cause harmful interference to, nor claim protection from, nor restrict future development of, terrestrial systems operating in the same frequency bands.

Until 1 January 2030, the channels 24, 84, 25, 85, 26 and 86 may also be used for analogue modulation described in the most recent version of Recommendation ITU-R M.1084 by an administration that wishes to do so, subject to not causing harmful interference to, or claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations. (WRC-19)

wa) In Regions 1 and 3:

The frequency bands 157.0125-157.1125 MHz and 161.6125-161.7125 MHz (corresponding to channels: 80, 21, 81 and 22) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842 using

multiple 25 kHz contiguous channels.

The frequency bands 157.1375-157.1875 MHz and 161. 7375-161.7875 MHz (corresponding to channels: 23 and 83) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842 using two 25 kHz contiguous channels. The frequencies 157.125 MHz and 161.725 MHz (corresponding to channel: 82) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU-R M.1842.

The frequency bands 157.0125-157.1875 MHz and 161.6125-161.7875 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) can also be used for analogue modulation described in the most recent version of Recommendation ITU-R M.1084 by an administration that wishes to do so, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations. (WRC-19))

x) In Angola, Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Democratic Republic of the Congo, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe, the frequency bands 157.1125-157.3375 and 161.7125-161.9375 MHz (corresponding to channels: 82, 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.

In China, the frequency bands 157.1375-157.3375 and 161.7375-161.9375 MHz (corresponding to channels: 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions. (WRC-19)

y) These channels may be operated as single or duplex frequency channels, subject to coordination with affected administrations. (WRC-12)

z) Channels ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092. (WRC-19)

zz) Channels 1027, 1028, 87 and 88 are used as single-frequency analogue channels for port operation and ship movement. (WRC-19)

Channels in NVR-2000

ITU Channel Table (According to REV.WRC-19 Appendix18)

CH	TX (MHz)	RX (MHz)	Remark
1	156.050	160.650	
2	156.100	160.700	
3	156.150	160.750	
4	156.200	160.800	
5	156.250	160.850	
6	156.300	156.300	
7	156.350	160.950	
8	156.400	156.400	
9	156.450	156.450	
10	156.500	156.500	
11	156.550	156.550	
12	156.600	156.600	
13	156.650	156.650	
14	156.700	156.700	
15	156.750	156.750	Fixed at 1W
16	156.800	156.800	Distress, Safety and Calling
17	156.850	156.850	Fixed at 1W
18	156.900	161.500	
19	156.950	161.550	
1019	156.950	156.950	
2019	--	161.550	Transmission prohibited
20	157.000	161.600	
1020	157.000	157.000	
2020	--	161.600	Transmission prohibited
21	157.050	161.650	
22	157.100	161.700	
23	157.150	161.750	
24	157.200	161.800	
25	157.250	161.850	
26	157.300	161.900	
1027	157.350	157.350	
1028	157.400	157.400	
60	156.025	160.625	
61	156.075	160.675	
62	156.125	160.725	
63	156.175	160.775	
64	156.225	160.825	
65	156.275	160.875	
66	156.325	160.925	
67	156.375	156.375	
68	156.425	156.425	
69	156.475	156.475	
70	156.525	156.525	For DSC operation only
71	156.575	156.575	
72	156.625	156.625	

CH	TX (MHz)	RX (MHz)	Remark
73	156.675	156.675	
74	156.725	156.725	
75	156.775	156.775	Fixed at 1W
76	156.825	156.825	Fixed at 1W
77	156.875	156.875	
78	156.925	161.525	
1078	156.925	156.925	
2078	--	161.525	Transmission prohibited
79	156.975	161.575	
1079	156.975	156.975	
2079	--	161.575	Transmission prohibited
80	157.025	161.625	
81	157.075	161.675	
82	157.125	161.725	
83	157.175	161.775	
84	157.225	161.825	
85	157.275	161.875	
86	157.325	161.925	
87	157.375	157.375	
88	157.425	157.425	

USA Channel Table (According to FCC 47 CFR Part 80: 80.215, 80.371 and 80.373)

CH	TX (MHz)	RX (MHz)	Remark
1001	156.050	156.050	
1005	156.250	156.250	
6	156.300	156.300	
1007	156.350	156.350	
8	156.400	156.400	
9	156.450	156.450	
10	156.500	156.500	
11	156.550	156.550	
12	156.600	156.600	
13	156.650	156.650	1W default
14	156.700	156.700	
15	-	156.750	Transmission prohibited
16	156.800	156.800	Distress, Safety and Calling
17	156.850	156.850	
1018	156.900	156.900	
1019	156.950	156.950	
20	157.000	161.600	
1020	157.000	157.000	
1022	157.100	157.100	
24	157.200	161.800	
25	157.250	161.850	
26	157.300	161.900	
27	157.350	161.950	
28	157.400	162.000	
1063	156.175	156.175	
1065	156.275	156.275	
1066	156.325	156.325	
67	156.375	156.375	1W default
68	156.425	156.425	
69	156.475	156.475	
70	156.525	156.525	For DSC operation only
71	156.575	156.575	1W default
72	156.625	156.625	
73	156.675	156.675	
74	156.725	156.725	
75	156.775	156.775	Fixed at 1W
76	156.825	156.825	Fixed at 1W
77	156.875	156.875	Fixed at 1W
1078	156.925	156.925	
1079	156.975	156.975	
1080	157.025	157.025	
84	157.225	161.825	
85	157.275	161.875	
86	157.325	161.925	
87	157.375	157.375	
88	157.425	157.425	

CAN Channel Table (According to RAMN-ARNM-2021)

CH	TX (MHz)	RX (MHz)	Remark
1	156.050	160.650	
1001	156.050	156.050	
2	156.100	160.700	
3	156.150	160.750	
4	156.200	160.800	
5	156.250	160.850	
1005	156.250	156.250	
6	156.300	156.300	
7	156.350	160.950	
1007	156.350	156.350	
8	156.400	156.400	
9	156.450	156.450	
10	156.500	156.500	
11	156.550	156.550	
12	156.600	156.600	
13	156.650	156.650	Fixed at 1W
14	156.700	156.700	
15	156.750	156.750	Fixed at 1W
16	156.800	156.800	Distress, Safety and Calling
17	156.850	156.850	Fixed at 1W
18	156.900	161.500	
1018	156.900	156.900	
19	156.950	161.550	
2019	--	161.550	Transmission prohibited
20	157.000	161.600	Fixed at 1W
1020	157.000	157.000	
2020	--	161.600	Transmission prohibited
21	157.050	161.650	
22	157.100	161.700	
23	157.150	161.750	
1023	--	161.750	Transmission prohibited
24	157.200	161.800	
25	157.250	161.850	
26	157.300	161.900	
2026	--	161.900	Transmission prohibited
27	157.350	161.950	
1027	157.350	157.350	
28	157.400	162.000	
60	156.025	160.625	
61	156.075	160.675	
62	156.125	160.725	
63	156.175	160.775	
1063	156.175	156.175	
64	156.225	160.825	
65	156.275	160.875	
1065	156.275	156.275	

CH	TX (MHz)	RX (MHz)	Remark
66	156.325	160.925	
1066	156.325	156.325	
67	156.375	156.375	
68	156.425	156.425	
69	156.475	156.475	
70	156.525	156.525	For DSC operation only
71	156.575	156.575	
73	156.675	156.675	
74	156.725	156.725	
75	156.775	156.775	Fixed at 1W
76	156.825	156.825	Fixed at 1W
77	156.875	156.875	Fixed at 1W
78	156.925	161.525	
1078	156.925	156.925	
2078	--	161.525	Transmission prohibited
79	156.975	161.575	
1079	156.975	156.975	
2079	--	161.575	Transmission prohibited
80	157.025	161.625	
1080	157.025	157.025	
81	157.075	161.675	
82	157.125	161.725	
83	157.175	161.775	
84	157.225	161.825	
85	157.275	161.875	
86	157.325	161.925	
2086	--	161.925	Transmission prohibited
87	157.375	157.375	
88	157.425	157.425	

WX (Weather) Channel Table (According to FCC Rule 47CER80.371(c) and 80.373(f))

CH	RX (MHz)	Remark
WX1	162.550	NOAA Weather Channel / CANADA CMB Service
WX2	162.400	NOAA Weather Channel / CANADA CMB Service
WX3	162.475	NOAA Weather Channel / CANADA CMB Service
WX4	162.425	NOAA Weather Channel
WX5	162.450	NOAA Weather Channel
WX6	162.500	NOAA Weather Channel
WX7	162.525	NOAA Weather Channel
WX8	161.650	CANADA CMB Service
WX9	161.775	CANADA CMB Service
WX10	163.275	NOAA Weather Channel (Assigned only)

Private Channels (Simplex)

CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
00	156.000	27	157.350	52	158.600	77	156.875
03	156.150	28	157.400	53	158.650	78	156.925
04	156.200	29	157.450	54	158.700	79	156.975
05	156.250	30	157.500	55	158.750	80	157.025
06	156.300	31	157.550	56	158.800	81	157.075
07	156.350	32	157.600	57	158.850	82	157.125
08	156.400	33	157.650	58	158.900	83	157.175
09	156.450	34	157.700	59	158.950	84	157.225
10	156.500	35	157.750	60	156.025	85	157.275
11	156.550	36	157.800	61	156.075	86	157.325
12	156.600	37	157.850	62	156.125	87	157.375
13	156.650	38	157.900	63	156.175	88	157.425
14	156.700	39	157.950	64	156.225	89	157.475
15	156.750	40	158.000	65	156.275	90	157.525
16	156.800	41	158.050	66	156.325	91	157.575
17	156.850	42	158.100	67	156.375	92	157.625
18	156.900	43	158.150	68	156.425	93	157.675
19	156.950	44	158.200	69	156.475	94	157.725
20	157.000	45	158.250	70	156.525	95	157.775
21	157.050	46	158.300	71	156.575	96	157.825
22	157.100	47	158.350	72	156.625	97	157.875
23	157.150	48	158.400	73	156.675	98	157.925
24	157.200	49	158.450	74	156.725	99	157.975
25	157.250	50	158.500	75	156.775	F5	155.000
26	157.300	51	158.550	76	156.825		

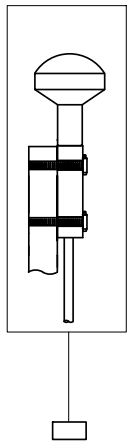
Note: *DSC function is not available for private channels.*

Appendix II. INSTALLATION DRAWINGS

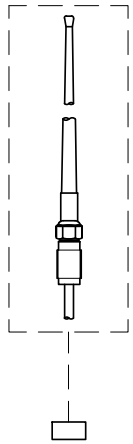
Drawing No.	Description
NVR2000-ID-001	NVR-2000 SYSTEM DIAGRAM
NVR2000-ID-002	NVR-2000 PORT DEFINITION DIAGRAM
NVR2000-ID-003	NVR-2000 SIZE DRAWING
NVR2000-ID-004	NVR-2000 MOUNTING DRAWING (TABLE TYPE)
NVR2000-ID-005	NVR-2000 MOUNTING DRAWING (FLUSH TYPE)
NVR2000-ID-006	NHS-102 MICROPHONE SIZE DRAWING
NVR2000-ID-007	PS-10B SIZE DRAWING (13.8V/10A)
NVR2000-ID-008	NVA100 VHF ANTENNA MOUNT DRAWING

NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
1			SIGNATURE	

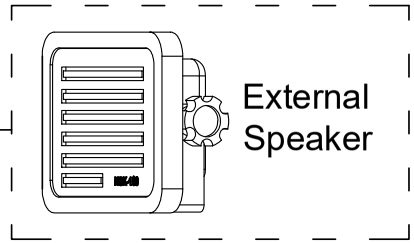
NGA100
GNSS ANTENNA



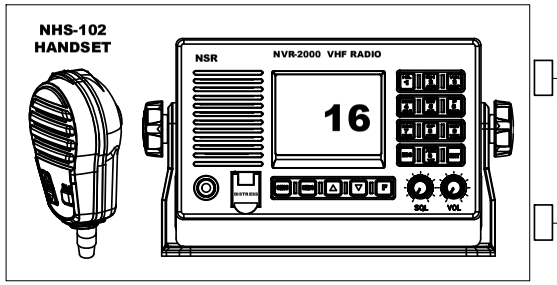
NVA100
VHF ANTENNA



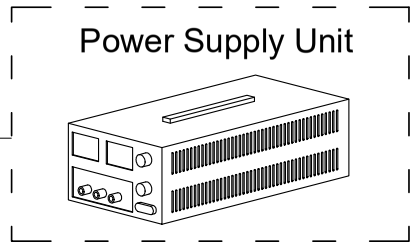
(OPTION)



NSK-100
(OPTION)



NVR-2000

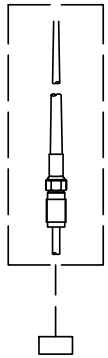


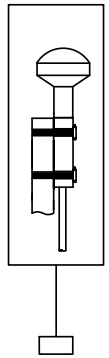
PS-10B
(OPTION)

APPLICATION	NVR-2000 SYSTEM DIAGRAM		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG NO.	NVR2000-ID-001		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED / CHECKED SIGNATURE
1			

NVA100
VHF ANTENNA





NGA100
GNSS ANTENNA

PL-259 Type

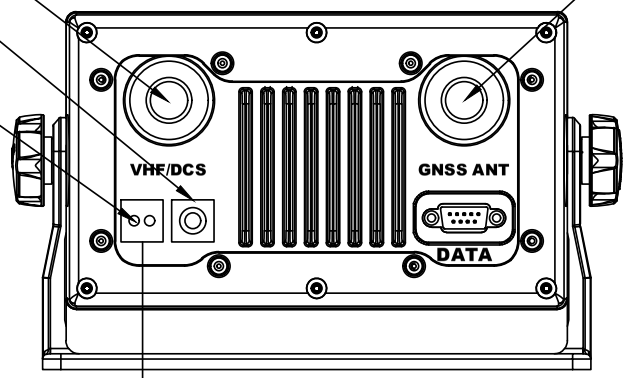
TNC

NVA100 VHF ANTENNA

EXTERNAL SPEAKER

DC13.8V

NGA100 GNSS ANTENNA



NVR-2000

2x2.5
13.8VDC

+ - 13.8V DC OUTPUT

POWER SUPPLY UNIT
PS-10B

220V AC INPUT

24V DC INPUT

2x1.5

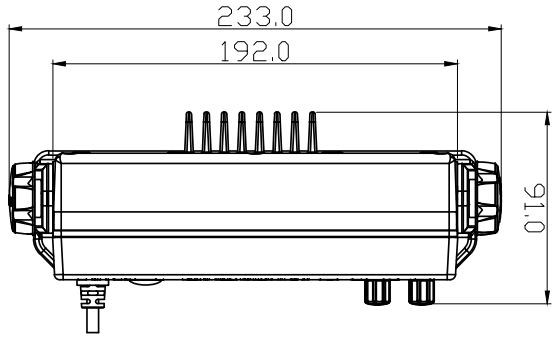
2x2.5

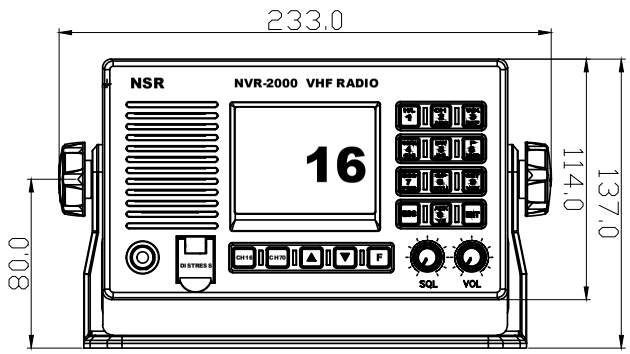
220V AC

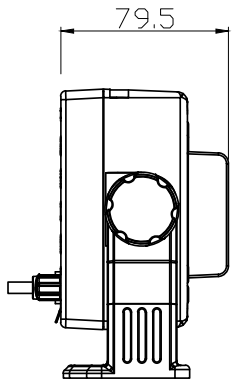
24V DC

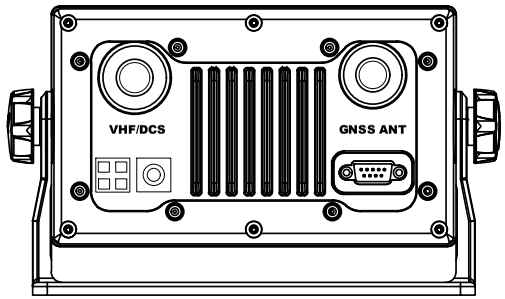
APPLICATION	NVR-2000 PORT DEFINITION DIAGRAM		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT mm PRE-ACTION	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG NO.	NVR2000-ID-002		

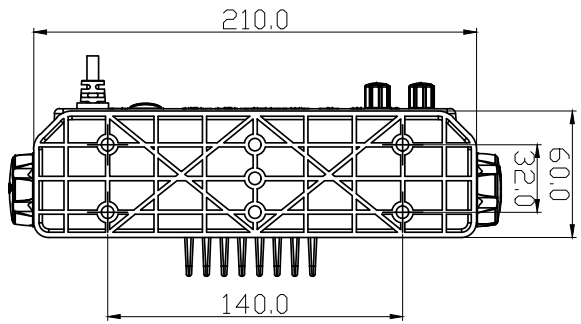
NO.	DATE	REVISION & DESCRIPTION	REVIEWED / CHECKED SIGNATURE
1			











APPLICATION	NVR-2000 SIZE DRAWING		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG. NO.	NVR2000-ID-003		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED / SIGNATURE	CHECKED
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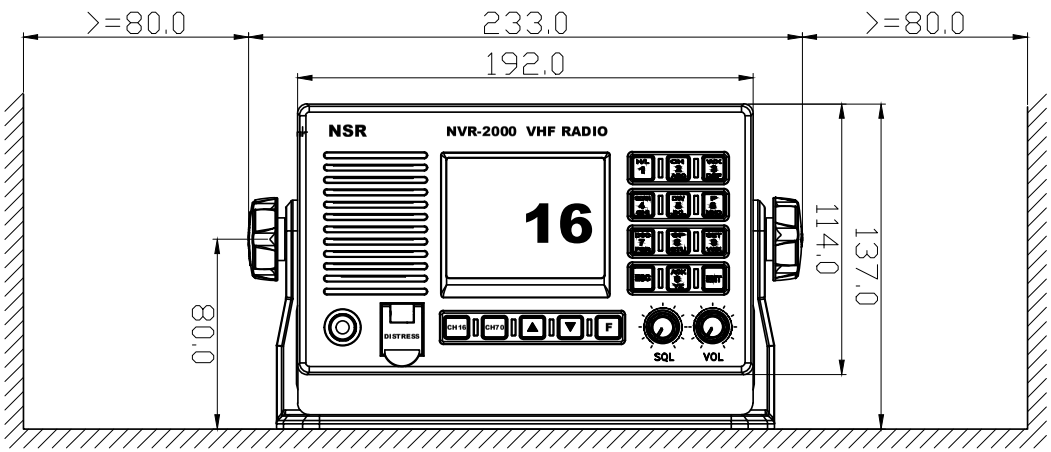
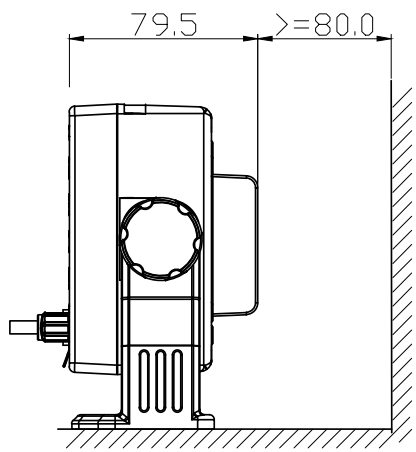


FRONT VIEW



SIDE VIEW

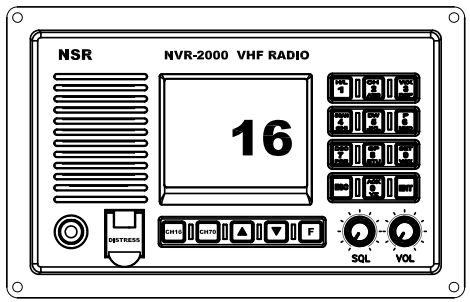
NOTE: TABLE TYPE

1.USE SELF-TAPPING SCREWS M5X20 FOR FIXING THE UNIT.

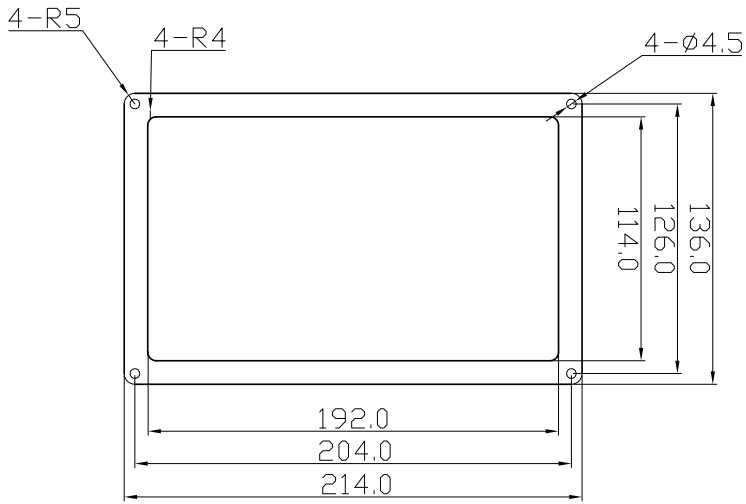
2.80MM IS MINIMUM SPACE FOR OPERATION AND CABLING.

APPLICATION	NVR-2000 MOUNT DRAWING (TABLE TYPE)		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT mm PROJECTION	
CHECKED			
DRAWING			
DWG NO.	NVR2000-ID-004	NSR marine	NEW SUNRISE CO., LTD.

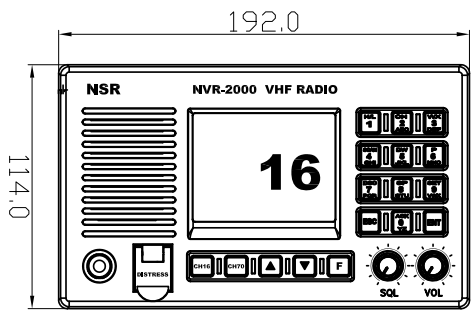
NO.	DATE	REVISION & DESCRIPTION	REVIEWED / CHECKED SIGNATURE
1			

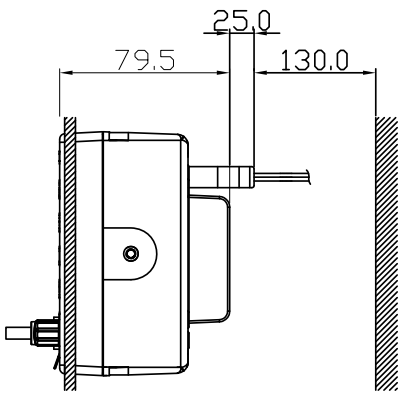


INSTALL EFFECT DIAGRAM



BRACKET DIMENSION



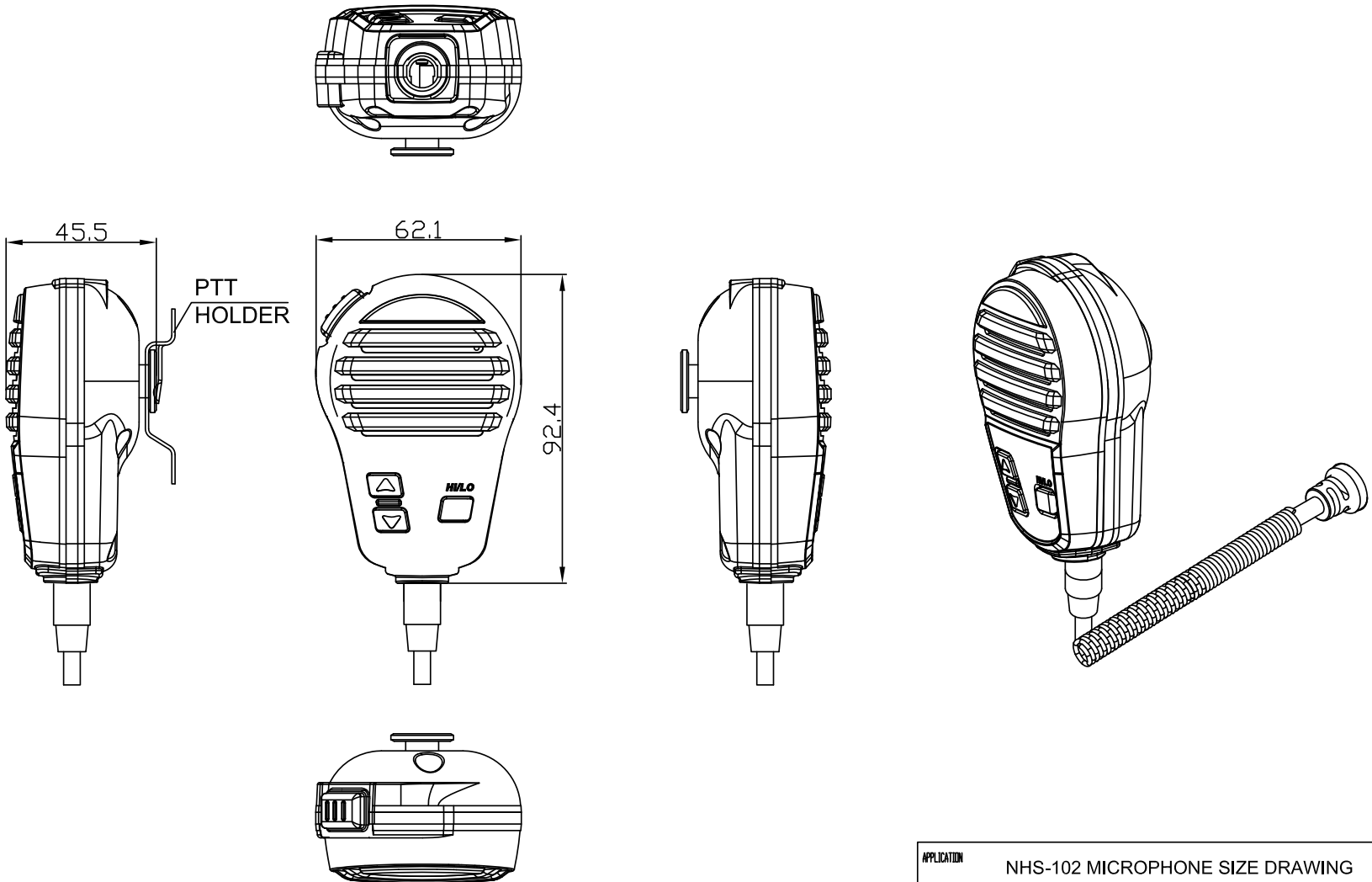


DIMENSIONAL DRAWING

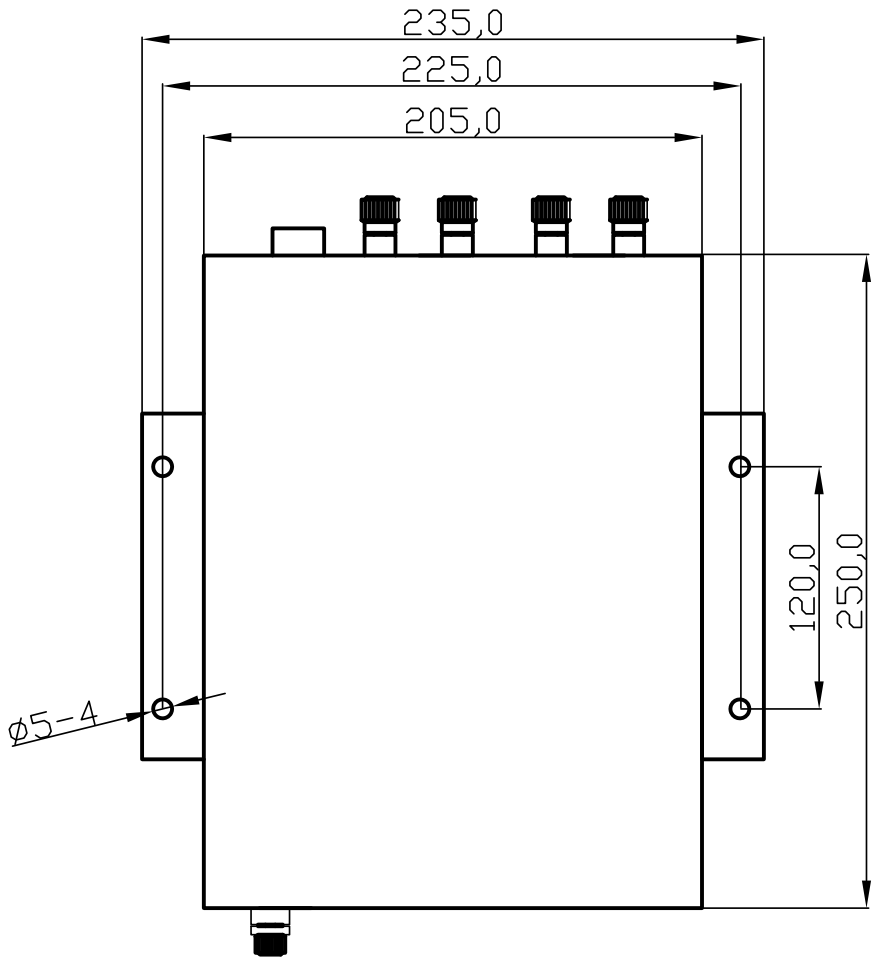
CUTTING SIZE

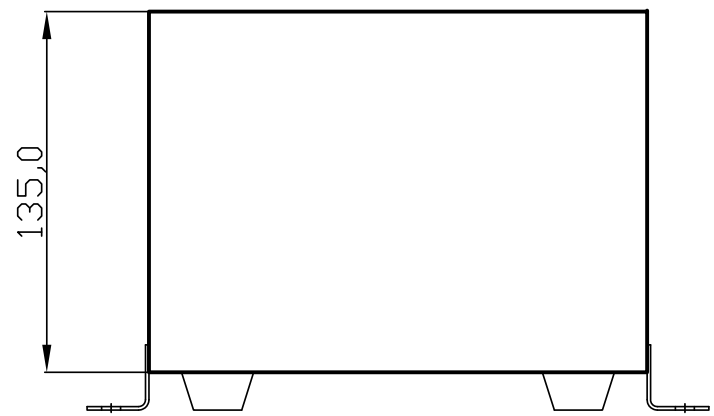
APPLICATION	NVR-2000 MOUNT DRAWING (FLUSH TYPE)		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG. NO.	NVR2000-ID-005		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED / SIGNATURE	CHECKED
1				



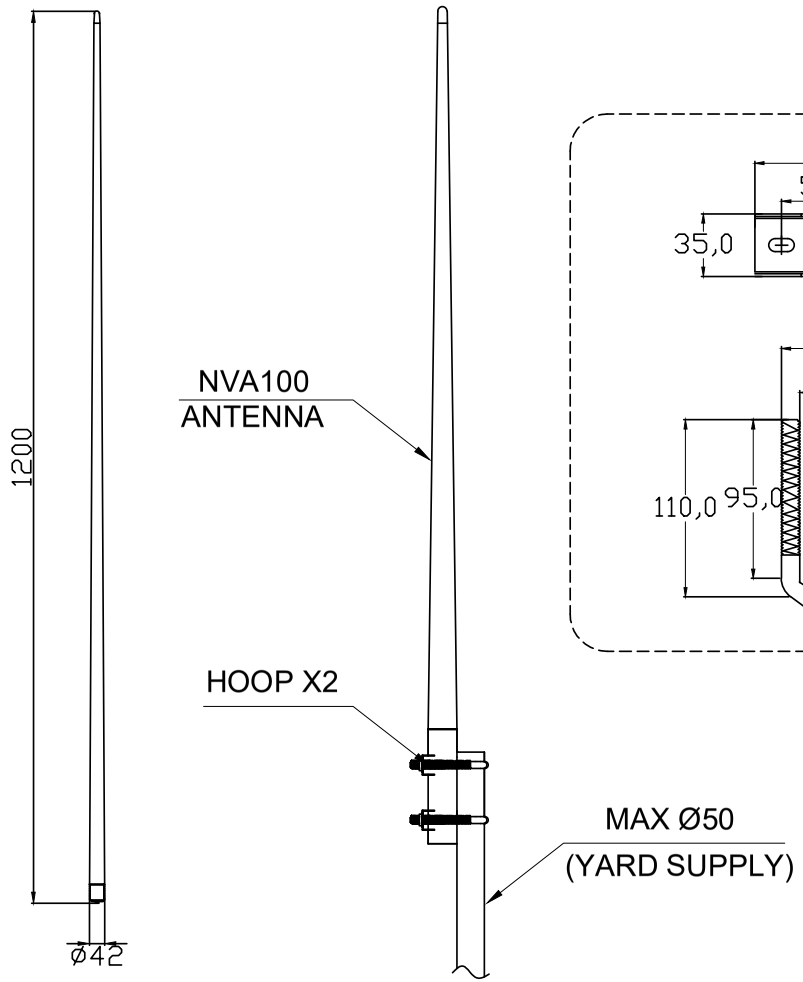
APPLICATION	NHS-102 MICROPHONE SIZE DRAWING		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT mm PRO-JECTION	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG. NO.	NVR2000-ID-006		

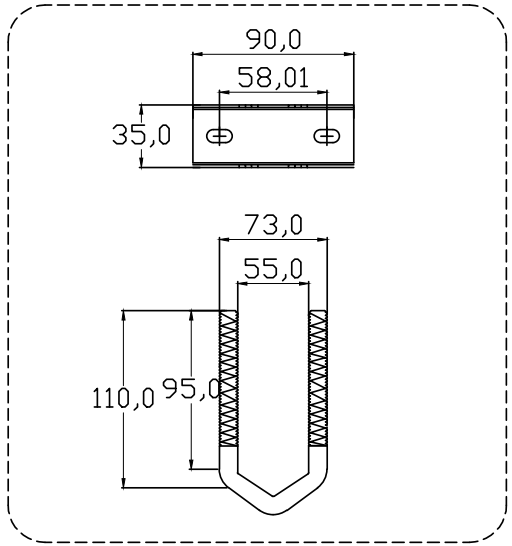




APPLICATION	PS-10B SIZE DRAWING(13.8V/10A)		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT mm	
CHECKED		NSR marine	NEW SUNRISE CO., LTD.
DRAWING			
DWG NO.	NVR2000-ID-007		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED SIGNATURE	CHECKED SIGNATURE
1				





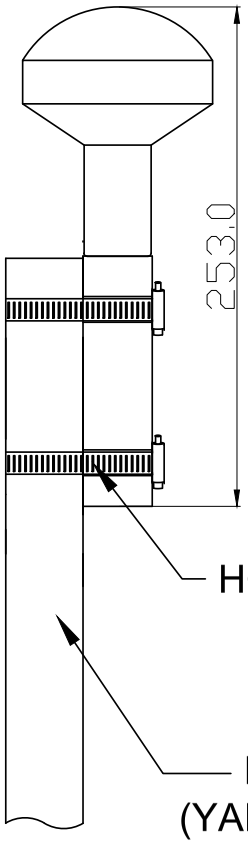
VHF ANTENNA

PART NO.	NVA100
TOTAL LENGHT	1200mm
FREQ RANGE	155MHZ~162MHz
INPUT IMPEDANCE	50Ω
GAIN	3.5dbi

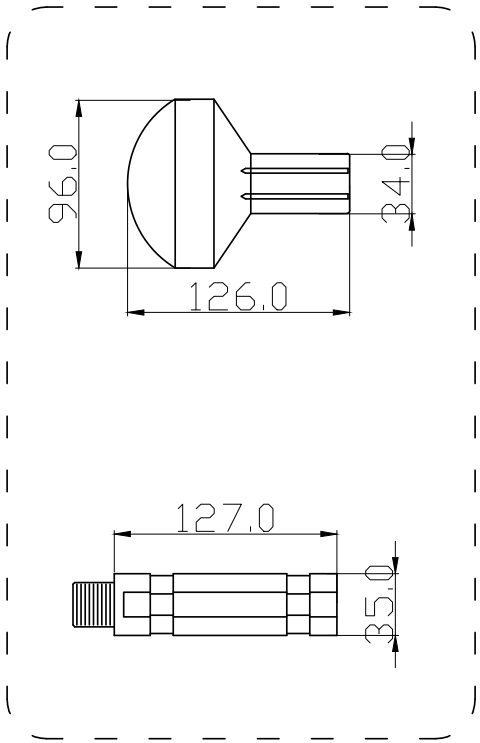
APPLICATION	NVA100 VHF ANTENNA SIZE DRAWING		
DATE		ITEM	SIZE A4
APPROVAL		SCALE N/S UNIT	
CHECKED			
DRAWING		NSR marine	NEW SUNRISE CO., LTD.
DWG NO.	NVR2000-ID-008		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED / CHECKED SIGNATURE
1			

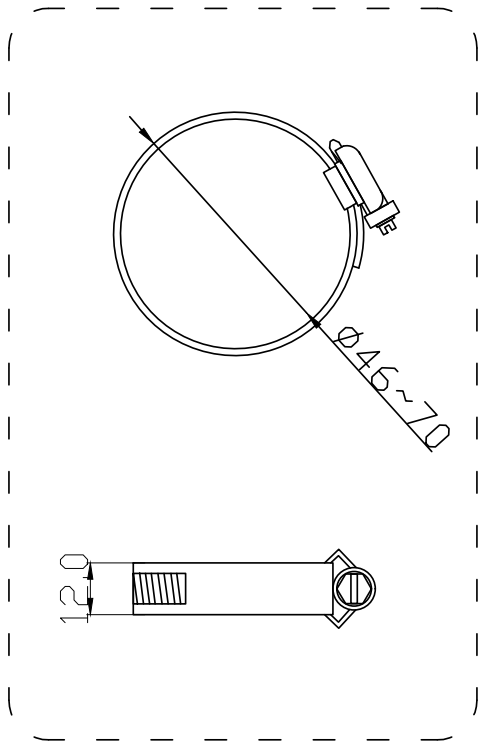
NGA100 GNSS ANTENNA



ANTENNA & MOUNT POLE



HOOP SIZE



APPLICATION	NGA100 ANTENNA SIZE&MOUNTING DRAWING
DATE	
APPROVAL	
CHECKED	
DRAWING	
DWG. NO.	NVR2000-ID-009
ITEM	
SCALE	N/S
UNIT	mm
SIZE	A4

NSR marine NEW SUNRISE CO., LTD.

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October, 2025