JHS-800S

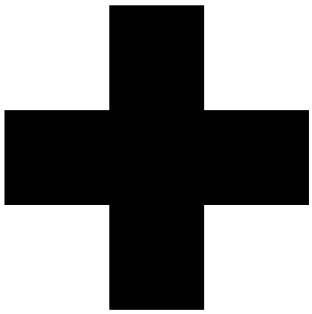
MARINE VHF RADIOTELEPHONE

Instruction Manual

7ZPJD0714

JRC Japan Radio Co., Ltd.

Safety Precautions



CAUTIONS AGAINST HIGH VOLTAGE

Radio and radar devices are operated by high voltages of anywhere from a few hundred volts up to many hundreds of thousands of volts.
Observe the following precautions to prevent the risk of electric shock.
Avoid contact with the internal parts of these devices.
Only specialized service people should do any maintenance, inspections, or adjustments inside the devices.
Falling after receiving an electric shock may lead to extensive secondary injuries, so be sure you have a safe place to stand when working.
In the event that someone receives an electric shock, immediately implement emergency procedures, such as cardiopulmonary resuscitation.

If you must reach into a device, as in the case of an emergency, you must switch off the devices and ground a terminal in order to discharge the capacitors. After making certain that all the electricity is discharged, only then can you insert your hand into the device. Wearing dry cotton work gloves is another way to reduce risks. One more necessary precaution is to not use both hands at the same time.
Although there is no danger with normal use, it is very dangerous if contact is made accidently with the internal parts of these devices. There is a very high risk of death by high voltages of tens of thousands of volts. In some cases, you could be fatally electrocuted by voltages of several hundred volts.

Precautions for rescuing victims from electrocution

If you find an electrocution victim, you must first switch off the machinery that caused the electrocution and ground all circuits.
If you are unable to immediately cut off the circuit, do not directly touch the victim. Quickly use a non-conductive material, such as a dry board or cloth, to move the victim away from the device.
If someone receives an electric shock, immediately implement emergency procedures, such as cardiopulmonary resuscitation.

When a person is electrocuted, the current passes through their heart and may cause ventricular fibrillation or cardiac arrest. Also, if the shock is mild, the victim's breathing may be restored by doing artificial respiration. An electrocution victim becomes very pale, their pulse can be very weak or even stop, and they may lose consciousness and become stiff.

First aid

☆Note points for first aid

Unless there is impending danger, leave the electrocution victim where he or she is, then begin artificial respiration. Once you begin artificial respiration, you must continue without losing rhythm.

(1) Make contact with the victim cautiously, there is a risk that you may get electrocuted.

(2) Switch off the machinery and then move the victim away slowly if you must.

(3) Inform someone immediately (a hospital or doctor, dial emergency numbers, etc.).

(4) Lay the victim on his or her back and loosen any constrictive clothing (a tie, or belt).

(5) (a) Check the victim's pulse.
(b) Check for a heartbeat by pressing your ear against the victim's chest.
(c) Check if the victim is breathing by putting the back of your hand or face near the victim's face.
(d) Check the pupils of the eyes.

(6) Open the victim's mouth and remove any artificial teeth, cigarette or chewing gum. Leave the mouth opened and flatten the tongue with a towel or by putting something into the mouth to prevent the victim's tongue from obstructing the throat. (If he or she is clenching the teeth and it is difficult to open the mouth, use a spoon or the like to pry open the mouth.)

(7) Continually wipe the mouth to prevent the accumulation of saliva.

☆If the victim has a pulse but is not breathing

("Mouth to mouth" resuscitation)　Figure 1

(1) Place the victim's head facing backward (place something under the neck like a pillow).

(2) Point the chin upward to widen the trachea.

(3) Pinch the victim's nose, take a deep breath, then put your mouth over the victim's mouth and exhale completely, making sure that your mouth completely covers the victim's mouth.　Then remove your mouth.　Repeat this routine 10 to 15 times per minute (holding the nostrils).

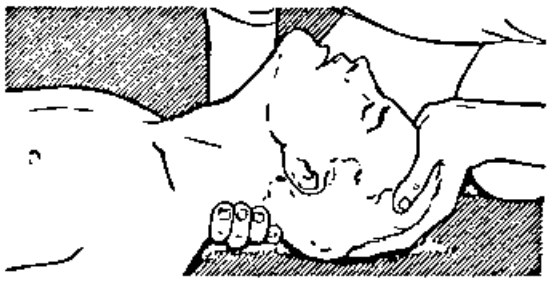
(4) Pay attention to the victim to notice if he or she starts to breath.　If breathing returns, stop resuscitation.

(5) If it is impossible to open the victim's mouth, put something like a plastic straw or vinyl tube into one of the nostrils then blow air in while covering the mouth and the other nostril.

(6) Occasionally, when the victim comes back to consciousness, they immediately try to stand up.　Prevent this and keep them in a laying position.　Give them something warm to drink and be sure that they rest (do not give them any alcohol).

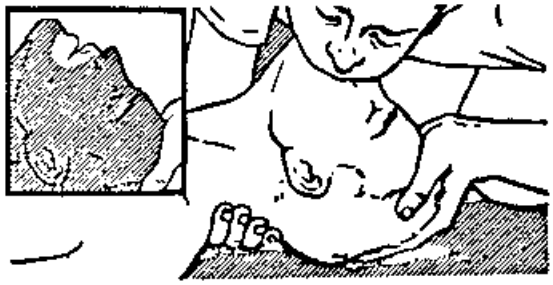
Administering artificial respiration by raising the head.

①



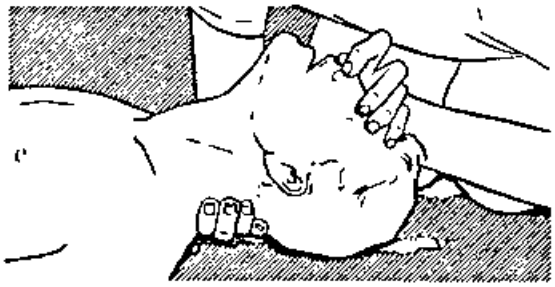
(1) Raise the back of head, then place one hand on the forehead and place the other hand under the neck. →①
Most victims open their mouth when this is done, making "mouth to mouth" resuscitation easier.

②



(2) Cover the victim's mouth by opening your mouth widely, then push your cheek against the victim's nose, →②
or pinch the victim's nose to prevent air from leaking out of it. →③

③



(3) Completely exhale into the lungs.
Exhale into the lungs until the chest inflates.
You have to blow as rapidly as possible for the first 10 times.

"Mouth to mouth" artificial respiration
Figure 1

Flow of Cardiopulmonary Resuscitation (CPR)

A person is collapsing.
- Secure the safety of the surrounding area.
- Prevent secondary disasters.

↓

Check for response.
- Call while tapping the shoulder.

→ Responding → Listen to the appeal of the injured or ill person and give the necessary first-aid treatment.

↓ Not responding

Ask for help.
- Make an emergency call.
- Ask to bring an AED.

↓

Open the airway.
- Check for breathing.

→ Breathing → Recovery position
- Lay the injured or ill person on his/her side and wait for the arrival of the emergency services.

↓ Not breathing

Give 2 rescue breaths; omittable Note(1)

↓

Give CPR.
- 30 chest compressions
- Give 2 rescue breaths; omittable Note(1)

↓

Arrival of an AED
- Turn on the power.
- Use the AED by following its voice prompts. Fitting of the electrode pads, etc.

↓

Automatic electrocardiogram analysis
- Do not touch the injured or ill person.

→ Electric shock is not needed.

↓ Electric shock is needed.

Delivery of electric shock

↓

Resume CPR from chest compressions by following the voice prompts of the AED.

→ When to stop CPR → **When the injured or ill person has been handed over to the emergency services or has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.**

The AED automatically analyzes the heart rhythm every 2 min.

Note(1) Omission of rescue breathing:
If there is a fear of infection because the injured or ill person has an intraoral injury, you are hesitant about giving mouth-to-mouth resuscitation, or preparing the mouthpiece for rescue breathing takes too long, omit rescue breathing and proceed to the next step.

Specific Procedures for Cardiopulmonary Resuscitation (CPR)

1. Check the scene for safety to prevent secondary disasters

a) Do not touch the injured or ill person in panic when an accident has occurred. (Doing so may cause electric shock to the first-aiders.)

b) Do not panic and be sure to turn off the power. Then, gently move the injured or ill person to a safe place away from the electrical circuit.

2. Check for responsiveness

a) Tap the shoulder of the injured or ill and shout in the ear saying, "Are you OK?"

b) If the person opens his/her eyes or there is some response or gesture, determine it as "responding." But, if there is no response or gesture, determine it as "not responding."

3. If responding

a) Give first-aid treatment.

4. If not responding

a) Ask for help loudly. Ask somebody to make an emergency call and bring an AED.
- **Somebody has collapsed. Please help.**
- **Please call an ambulance.**
- **Please bring an AED.**
- If there is nobody to help, call an ambulance yourself.

5. Open the airway

a) Touch the forehead with one hand. Lift the chin with the two fingers of the middle finger and forefinger of the other hand and push down on the forehead as you lift the jaw to bring the chin forward to open the airway. If neck injury is suspected, open the airway by lifting the lower jaw.

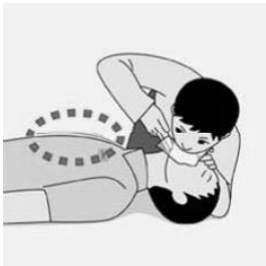
6. Check for breathing

a) After opening the airway, check quickly for breathing for no more than 10 seconds. Put your cheek down by the mouth and nose area of the injured or ill person, look at his/her chest and abdomen, and check the following three points.
- Look to see if the chest and abdomen are rising and falling.
- Listen for breathing.
- Feel for breath against your cheek.

b) If the injured or ill person is breathing, place him/her in the recovery position and wait for the arrival of the emergency services.
- Position the injured or ill person on his/her side, maintain a clear and open airway by pushing the head backward while positioning their mouth downward. To maintain proper blood circulation, roll him/her gently to position them in the recovery position in the opposite direction every 30 minutes.

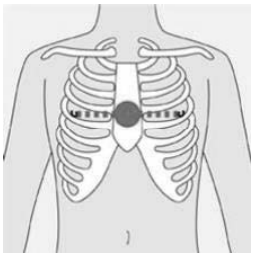
7. Give 2 rescue breaths (omittable)

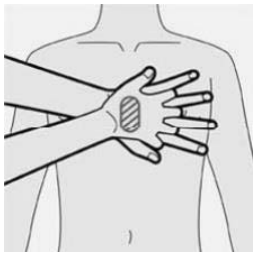
a) If opening the airway does not cause the injured or ill person to begin to breathe normally, give rescue breaths.
b) If there is a fear of infection because the injured or ill person has an intraoral injury, you are hesitant about giving mouth-to-mouth resuscitation, or getting and preparing the mouthpiece for rescue breathing takes too long, omit rescue breathing and perform chest compressions.
c) When performing rescue breathing, it is recommended to use a mouthpiece for rescue breathing and other protective devices to prevent infections.
d) While maintaining an open airway, pinch the person's nose shut with your thumb and forefinger of the hand used to push down the forehead.
e) Open your mouth widely to completely cover the mouth of the injured or ill person so that no air will escape. Give rescue breathing **twice in about 1 second** and check if the chest rises.



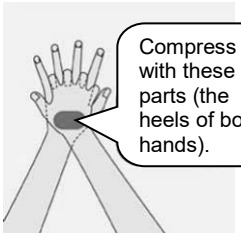
8. Cardiopulmonary resuscitation (CPR) (combination of chest compressions and rescue breaths)

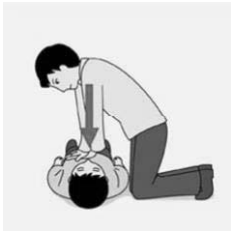
a) Chest compressions
1) Position of chest compressions
- Position the heel of one hand in the center of the chest, approximately between the nipples, and place your other hand on top of the one that is in position.



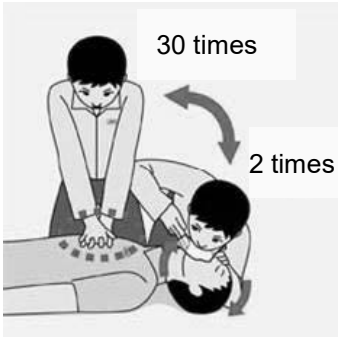


2) Perform chest compressions
- Perform uninterrupted chest compressions of **30** at the rate of about **100 times** per minute. While locking your elbows positioning yourself vertically above your hands.
- With each compression, depress the chest wall to a depth of approximately **4 to 5 cm**.





b) Combination of **30** chest compressions and **2** rescue breaths
1) After performing **30** chest compressions, give **2** rescue breaths. If rescue breathing is omitted, perform only chest compressions.
2) Continuously perform the combination of **30** chest compressions and **2** rescue breaths without interruption.
3) If there are two or more first-aiders, alternate with each other approximately every **two minutes** (five cycles of compressions and ventilations at a ratio of 30:2) without interruption.



9. When to stop cardiopulmonary resuscitation (CPR)

a) When the injured or ill person has been handed over to the emergency services
b) When the injured or ill person has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.

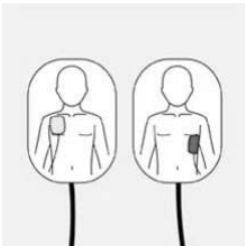
10. Arrival and preparation of an AED

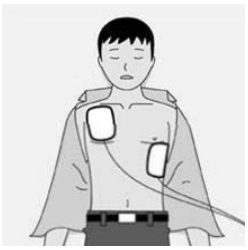
a) Place the AED at an easy-to-use position. If there are multiple first-aiders, continue CPR until the AED becomes ready.
b) Turn on the power to the AED unit. Depending on the model of the AED, you may have to push the power on button, or the AED automatically turns on when you open the cover.
c) Follow the voice prompts of the AED.

Turn on the power.

11. Attach the electrode pads to the injured or ill person's bare chest

a) Remove all clothing from the chest, abdomen, and arms.
b) Open the package of electrode pads, peel the pads off and securely place them on the chest of the injured or ill person, with the adhesive side facing the chest. If the pads are not securely attached to the chest, the AED may not function. Paste the pads exactly at the positions indicated on the pads, If the chest is wet with water, wipe dry with a dry towel and the like, and then paste the pads. If there is a pacemaker or implantable cardioverter defibrillator (ICD), paste the pads at least 3cm away from them. If a medical patch or plaster is present, peel it off and then paste the pads. If the injured or ill person's chest hair is thick, paste the pads on the chest hair once, peel them off to remove the chest hair, and then paste new pads.
c) Some AED models require to connect a connector by following voice prompts.
d) The electrode pads for small children should not be used for children over the age of 8 and for adults.



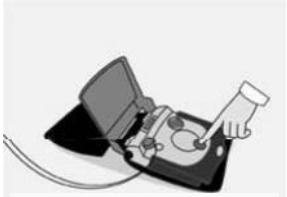


12. Electrocardiogram analysis

a) The AED automatically analyzes electrocardiograms. Follow the voice prompts of the AED and ensure that nobody is touching the injured or ill person while you are operating the AED.
b) On some AED models, you may need to push a button to analyze the heart rhythm.

13. Electric shock (defibrillation)

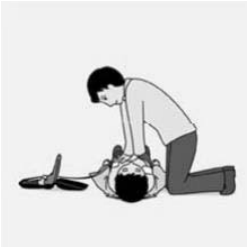
a) If the AED determines that electric shock is needed, the voice prompt saying, "Shock is needed" is issued and charging starts automatically.
b) When charging is completed, the voice prompt saying, "Press the shock button" is issued and the shock button flashes.
c) The first-aider must get away from the injured or ill person, make sure that no one is touching him/her, and then press the shock button.
d) When electric shock is delivered, the body of the injured or ill person may jerk.



Press the shock button.

14. Resume cardiopulmonary resuscitation (CPR).

Resume CPR consisting of **30** chest compressions and **2** rescue breaths by following the voice prompts of the AED.



15. Automatic electrocardiogram analysis

a) When **2 minutes** have elapsed since you resumed cardiopulmonary resuscitation (CPR), the AED automatically analyzes the electrocardiogram.
b) If you suspended CPR by following voice prompts and AED voice prompt informs you that shock is needed, give electric shock again by following the voice prompts.
If AED voice prompt informs you that no shock is needed, immediately resume CPR.

16. When to stop CPR (Keep the electrode pads on.)

a) When the injured or ill person has been handed over to the emergency services
b) When the injured or ill person has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.

Preface

Thank you for purchasing JRC's JHS-800S Marine VHF Radiotelephone. This radiotelephone can be used as a Global Maritime Distress and Safety System (GMDSS) radio device, compliant with international regulations, that provides emergency communications and standard communications capabilities for small and large ships.

- Please read this instruction manual thoroughly before using the equipment.
- Please keep this manual available for future reference.
  Please refer to it if any difficulties are encountered when using the equipment.
- Do not use the optional Bluetooth wireless handset when using the GMDSS system.

Before Operation

Concerning the symbols

This manual uses the following symbols to explain correct operation and to prevent injury or damage to property.

The symbols and descriptions are as follows. Understand them before proceeding with this manual.

⚠ **WARNING**	Indicates a warning that, if ignored, may result in serious injury or even death.
⚠ **CAUTION**	Indicates a caution that, if ignored, may result in injury or damage to property.

Examples of symbols

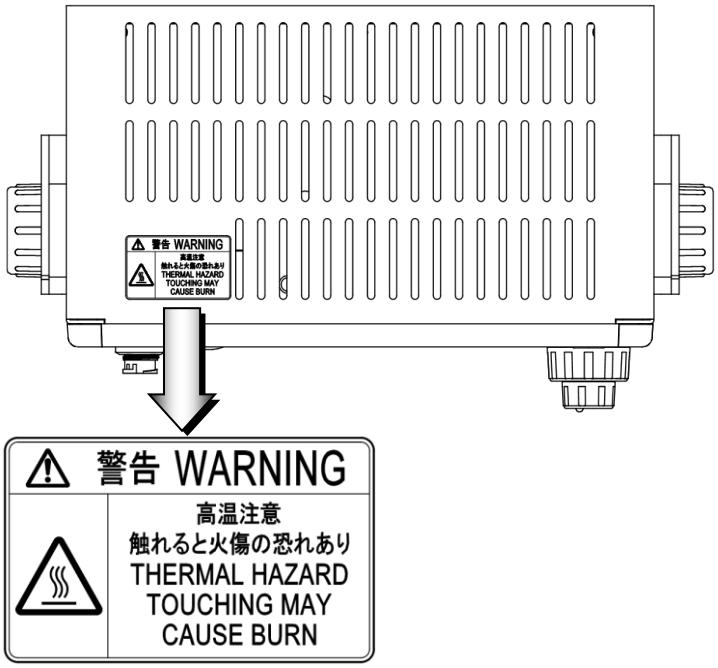
The △ symbol indicates caution (including DANGER and WARNING). The illustration inside the △ symbol specifies the content of the caution more accurately. (This example warns of possible electrical shock.)

The ⃠ symbol indicates that performing an action is prohibited. The illustration inside the ⃠ symbol specifies the contents of the prohibited operation. (in this example disassembly is prohibited.)

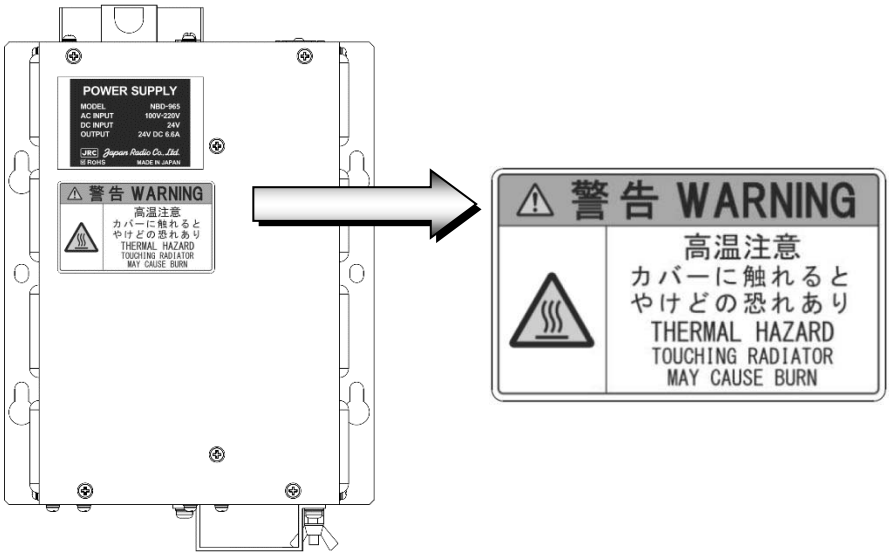
The ● symbol indicates operations that must be performed. The illustration inside the ● symbol specifies obligatory instructions. (In this example unplugging is the obligatory instruction.)

About Warning Labels

There is warning labels on the main unit (JHS-800S) and the power supply unit (NBD-980). Do not remove, damage, or alter the warning labels.



JHS-800S Marine VHF Radiotelephone



NBD-980 Power supply

Handling precaution

⚠ WARNING

Do not open the equipment to inspect or repair it. Inspection or repairs by anyone other than a specialized technician may result in fire, electrical shock, or malfunction.
If internal inspection or repair is necessary, contact our service center or agents.

Do not disassemble or customize this unit. Doing so may cause fire, electrical shock, or malfunction.

Do not get this equipment wet or spill any liquids on or near this equipment.
Doing so may cause electrical shock or equipment malfunction.

Do not touch any of the areas with warning labels.
Doing so may cause electrical shock.

Do not use a voltage other than specified.
Doing so may cause fire, electrical shock, or malfunction.

Do not remove protective covers on the high voltage terminals.
Doing so may cause electrical shock.

Do not insert anything flammable into the equipment.
Doing so may cause fire, electrical shock, or malfunction.

If a distress alert is received, make sure to inform the ship's captain or officer in charge.
Doing so may save the lives of the crews and passengers on the ship in distress.

This unit is also used for the distress communication, in addition to usual communication. Contact JRC or our agent if any problem is observed in this unit on usual operation or inspection. Do NOT ignore or leave any problems of this unit.

Always use the specified fuse when replacing a fuse. Using a different fuse may result in fire or malfunction.

Before replacing fuses of the POWER SUPPLY (NBD-965), always turn off the AC/DC power switch and power source output to this unit.

In addition to the DC fuse on the panel of the POWER SUPPLY (NBD-965), there are also AC fuses contained in the unit. Opening and working with the inside of the unit may result in fire or electrocution, so with the exception of qualified service personnel, do NOT attempt to replace the AC fuses. To replace the AC fuses, contact JRC or our agent.

⚠ CAUTION

Do not use this equipment for anything other than specified.
Doing so may cause failure or malfunction.

Do not turn the trimmer resistors or the trimmer capacitors on the PCB unit. Doing so may cause failure or malfunction. They are preset at the factory.

Do not install this equipment in a place near water or in one with excessive humidity, steam, dust or soot. Doing so may cause fire, electric shock, or malfunction.

Do not test the distress alert as doing so will inconvenience local shipping and Rescue Centers.

Do NOT turn off the power of the equipment when at sea because the SOLAS Convention requires keeping CH16 watch at all times.

Always listen to the CH16 except when talking on a specific channel.

To operate DSC and ATIS functions of this equipment, ID numbers must be registered respectively. If not been registered, contact our agent or service center.

Leave installation of this equipment to our service center or agents. Special knowledge on selecting the place where the antenna is to be mounted and setting the ID number (MMSI) assigned to the ship is required besides mounting operation.

When sending a distress alert, follow the instructions of the ship's captain or officer in charge.

If a false distress alert is transmitted accidentally, use the [CANCEL] button to cancel transmission of the distress alert. Then report the false distress alert to a nearby RCC (Rescue Coordination Center). In Japan, inform the nearest Japan Coast Guard. Follow the on-screen instructions to report the following information.

Ship's name, type, nationality, and ID number, the date/time, location and reason why the false distress alert was transmitted.

Also the unit model name and manufacture number/date, if possible.

To turn off an alarm or clear a display such as a received DSC message, do NOT press the DISTRESS button. Doing so may cause a false distress alert.
(Touch the [CANCEL] button to turn off the alarm and delete the on-screen message.)

⚠ CAUTION

When sending a DROBOSE (distress call on behalf of someone else) call, do NOT press the DISTRESS button. Doing so may cause a false distress alert.
(DROBOSE calls can be sent via [CALL] button displayed on the screen.)

A distress acknowledgement or a distress relay call can be transmitted from a received distress message stored in the log, but when sending such a kind of call, follow the instructions of the ship's captain or officer in charge.

In order to avoid accidental distress message treating, received distress messages will be erased automatically after 48 hours elapsed since the reception. Accordingly, if such messages cannot be read out, it is NOT a malfunction.

The time set in the menu DATE&TIME [1/2]DATE shows the current time. It is not reflected in the time in POS/TIME [2/2]UTC POS (the time when the ship was in that position according to the position information).

The time set in the menu POS/TIME [2/2]UTC POS shows the time when the ship was in that position according to the position information. It is not reflected in the time (current time) in the menu DATE&TIME [1/2]DATE.

Close the water-resistant cap of the waterproof type handset box after use. Rain and sea breeze could cause connector malfunction. Also do not leave the handset above deck.

The thermal head of the printer may be very hot after printing. Do not touch it.
Perform paper replacement and head cleaning only after waiting for the head to completely cool.

Do not put your finger etc. because there is a cutter blade at the paper discharge port.
Also, do not touch the blade of the cutter when opening the paper cover.

The printing paper used in this printer is a heat sensitive paper. Take the following precautions when using this paper.

- Store the paper away from heat, humidity, or heat sources.
- Do not rub the paper with any hard objects.
- Do not place the paper near organic solvents.
- Do not allow the paper to come in contact with polyvinyl chloride film, erasers, or adhesive tape for long periods of time.
- Keep away the paper from freshly copied diazo type or wet process copy paper.

Always set the expanded MMSI in the bridge of the vessel to zero (0). If setting to another value other than zero, DSC calls may not be received.

Do not carry out operation of touch panel by a sharp object.
Otherwise, the screen may be damaged.

If power outage occurs inside of the ship during the operation of this unit, the image may be disturbed or may not be displayed.
In this case, reconnect the power supply.

DISTRESS ALERTS

Sending a Distress Alert

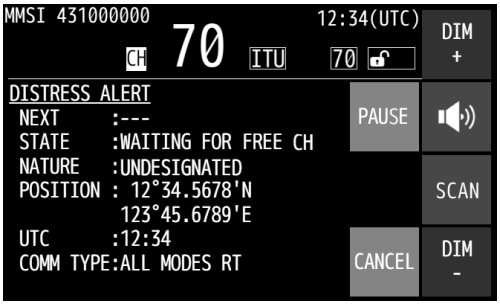
⚠ CAUTION

When sending a distress alert, follow the instructions of the ship's captain or officer in charge.

1. Open the protective cover on the DISTRESS button for the JHS-800S MARINE VHF RADIOTELEPHONE or NCM-980 CONTROLLER.

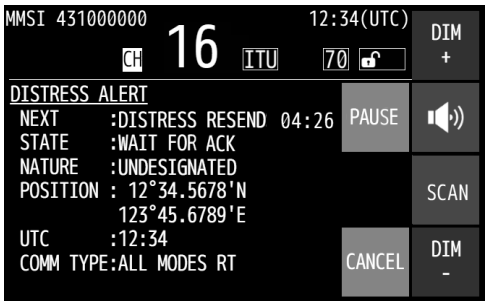
2. Press and hold the DISTRESS button for at least 3 seconds until the countdown is completed.

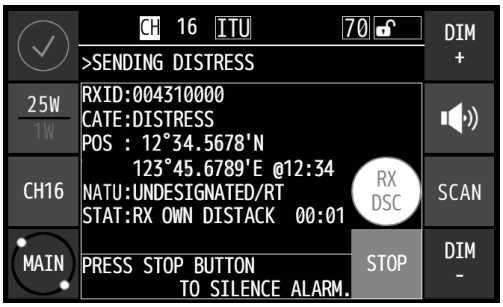
When the countdown is finished, the screen below on the right is displayed and after confirmed that the channel is free or after 1 seconds, whichever occurs first, the distress alert is transmitted. On the controller, "DISTRESS PRESSED / BY (controller name) AND START" is displayed.



3. After sending the distress alert, wait for an acknowledgement.

The radiotelephone can be used to communicate even while waiting for an acknowledgement. When an acknowledgement is received, touch the [STOP] button to cancel the alarm on the below right screen, and communicate with the station. Unless an acknowledgement is received or the distress alert is cancelled manually, the equipment repeats the distress alert every 3 minutes 30 seconds to 4 minutes 30 seconds.





4. After receiving acknowledgement, lift the handset and request rescue using CH16 of the radiotelephone.

First, the responding station calls by radiotelephone. Communicate the following information to that station.

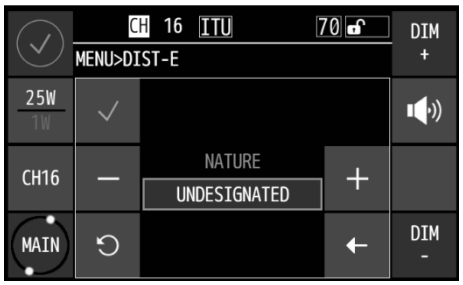
Say "MAYDAY", "This is (name of your ship)", Tell the ship's Maritime Mobile Service Identity number, call sign, ship's position, nature of distress, and rescue requests.

Note If time permits, enter the nature of the distress as follows, just before sending the distress alert. (For more details, see 4.4.5.2.)

1) In the main menu, touch the [DIST-E] buttons.

2) In the screen shown on the right, touch the [EDIT] → [NATURE] button, and then use the [+]/[-] buttons to select the nature of your distress.

3) Touch the [✓] button.
After the nature of your distress is set, the DIST-E menu appears. If the position and time are not displayed automatically, select the [EDIT]→[POS] and [EDIT]→[UTC] buttons and input them manually.



4) Press and hold the DISTRESS button for at least 3 seconds until the countdown is completed.
The rest of the procedure is the same as described above.

Terminating a Distress Alert

⚠ CAUTION

If a false distress alert is transmitted accidentally, use the [CANCEL] button to cancel transmission of the distress alert. Then report the false distress alert to a nearby RCC (Rescue Coordination Center). In Japan, inform the nearest Japan Coast Guard. Follow the on-screen instructions to report the following information.

Ship's name, type, nationality, and ID number, the date/time, location and reason why the false distress alert was transmitted.

Also the unit model name and manufacture number/date, if possible.

Touch the [CANCEL] button.

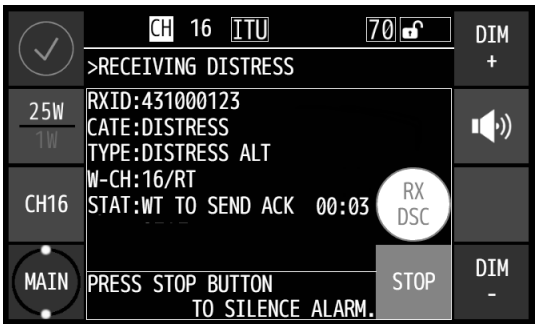
The popup shown below is displayed. Touching the [CONT] button cancels transmission of the distress alert. After that, follow the on-screen instructions.
Note) For more details, see the description in the 4.4.5.1 Quick distress alerts.

Receiving a Distress Alert

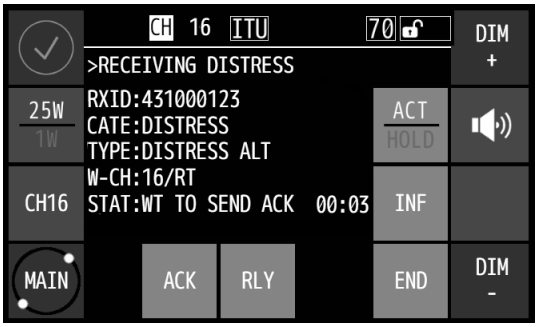
⚠ WARNING

If a distress alert is received, make sure to inform the ship's captain or officer in charge.
Doing so may save the lives of the crews and passengers on the ship in distress.

1. When a distress alert is received, the information such as the ID number of the ship in distress and the stage of the distress event are displayed.
If the equipment is not used, i.e. there is no active procedure at that time, the CH16 is set and the Receive mark starts blinking, and the alarm gradually grows louder.



2. Touch the [STOP] button to stop the alarm.
Keep watch on CH16 for at least 5 minutes, and notify the coast station as appropriate.



3. Touch the [ACK] button to respond from your own ship with the results of coordinating with the coast station and monitoring CH16.

After sending it, commence distress traffic via radiotelephony on CH16 as follows.

- Say "MAYDAY",
- Repeat the identity (MMSI) of the ship in distress 3 times,
- Say "This is",
- Repeat the identity (MMSI) of your ship 3 times,
- Say "RECEIVED MAYDAY".

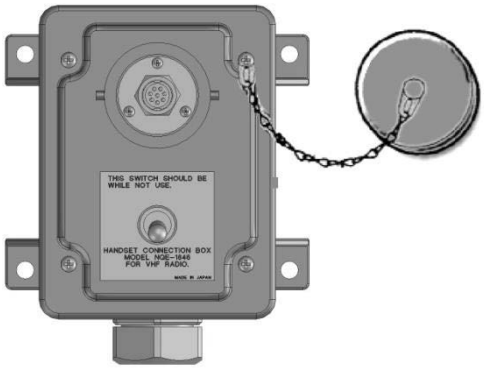
Equipment exterior

- JHS-800S Marine VHF Radiotelephone/NQW-980 Handset

- NCM-980 VHF Controller/NQW-980 Handset

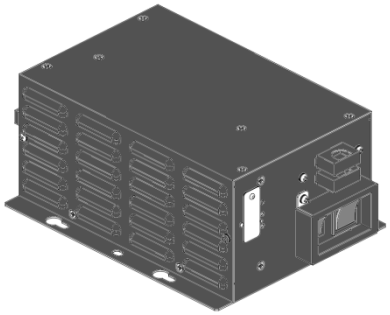
- NQE-1845 Handset Connector Box
  Waterproofed flush mount type
  (for wing console)

- NQE-1846 Handset Connector Box
  Waterproofed wing installation type

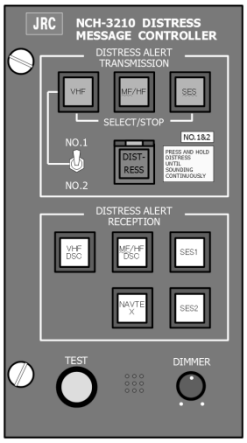


- NQE-1847B Handset Connector Box
  Indoor flush mount type

- NBD-965 AC/DC Power Unit



- NCH-3210 Distress Message Controller



- NKG-980 Printer

- NVS-423R External Speaker

Contents

Preface ix
Before operation x
Handling precaution xii
DISTRESS ALERTS xv
Equipment exterior xviii
Glossary of terms xxiv
1. EQUIPMENT OVERVIEW 1-1
1.1 Functions 1-1
1.2 Features 1-1
1.3 Basic configuration 1-2
1.3.1 Basic configuration of the main unit 1-2
1.3.2 Options 1-2
1.3.3 System configuration 1-3
1.4 External dimensions 1-4
1.5 Block diagram 1-12
2. NAMES AND FUNCTIONS 2-1
2.1 Main unit (JHS-800S) and Controller (NCM-980) 2-1
2.2 Main displays 2-2
2.2.1 Status display 2-2
2.2.2 Operating display 2-4
2.2.3 Function screen 2-7
2.2.4 Menu screen 2-8
3. INSTALLATION 3-1
4. OPERATION 4-1
4.1 Overview of operations of the equipment 4-2
4.2 Basic communication procedure 4-4
4.2.1 Turning ON the power 4-4
4.2.2 Turning OFF the power 4-5
4.2.3 Communicating with the radiotelephone 4-6
4.2.4 Receiving with scanning 4-10
4.2.5 Receiving with dual watch 4-11
4.2.6 Receiving on triple watch 4-12
4.2.7 Using memory channels 4-13
4.2.8 Communicating on a private channel 4-14
4.2.9 Receiving a weather channel 4-15
4.2.10 Changing the channel region 4-15

4.2.11 Squelch settings of each channel (preset squelch) 4-16
4.3 Basic DSC operations 4-17
4.3.1 Routine calls to an individual station 4-17
4.3.2 Receiving routine individual calls 4-19
4.3.3 Routine group calls 4-21
4.3.4 Receiving routine group calls 4-22
4.3.5 Communicating with a PSTN subscriber 4-23
4.3.6 AIS-linked DSC calls 4-26
4.4 Emergency calls (DSC safety/ urgency/ distress calls) 4-27
4.4.1 Safety or urgency calls to an individual station 4-27
4.4.1.1 Special safety individual calls (test calls and position request calls) 4-27
4.4.2 Receiving safety or urgency individual calls 4-29
4.4.2.1 Receiving special safety individual calls (test calls and position request calls) 4-29
4.4.3 Safety or urgency all ships calls 4-30
4.4.4 Receiving safety or urgency all ships calls 4-31
4.4.5 Distress alerts 4-32
4.4.5.1 Quick distress alerts 4-32
4.4.5.2 Distress alerts from the menu 4-35
4.4.5.3 Receiving distress alerts 4-38
4.4.6 Distress relay calls on behalf of someone else (DROBOSE) 4-39
4.5 DSC call log 4-42
4.5.1 Received distress messages 4-42
4.5.2 Received other messages 4-43
4.5.3 Transmitted messages 4-43
4.6 Other features 4-44
4.6.1 Notification of registered ships by the AIS 4-44
4.6.2 Playback of received voice 4-45
4.6.3 Public Address function with an external speaker (option) 4-48
4.6.4 Intercom 4-49
4.6.5 Talk with a Bluetooth device (option) 4-51

5. SETTINGS & REGISTRATIONS 5-1

5.1 Date and time setting 5-1
5.2 Own ship position and time setting 5-3
5.3 Settings for each device 5-4
5.3.1 LCD adjustment 5-4
5.3.2 Sound settings 5-5
5.3.3 User key assignment 5-6
5.3.4 Name the device 5-7
5.3.5 Menu shutdown timer setting 5-8
5.3.6 Setting the handset 5-8
5.3.7 Setting the channel area 5-9
5.3.8 Setting the S meter display 5-9
5.4 Creating contact lists 5-10
5.5 Advanced settings for DSC 5-12
5.5.1 Automatic acknowledgement 5-12

5.5.2 Disabling receiving alarms for routine and safety calls 5-13
5.5.3 Disabling receiving alarms for routine and safety calls 5-13
5.5.4 Expanded MMSI registration 5-14
5.5.5 Registering the ship's group ID 5-14
5.5.6 Setting the inactivity timer (for procedures on hold) 5-15
5.6 Other settings 5-16
5.6.1 Enabling the AIS function 5-16
5.6.2 Setting printer properties 5-16
5.6.3 Setting the controller status when external power is turned on 5-17

6. MAINTENANCE & INSPECTION 6-1

6.1 General maintenance & inspection 6-1
6.2 Self diagnosis inspection 6-2
6.3 Cleaning the touch panel 6-4
6.4 System alarm indication 6-5
6.4.1 Alarm list 6-6
6.4.2 Viewing the alarm history 6-7
6.5 Checking the setup condition 6-8
6.5.1 System information 6-8
6.5.2 Software version 6-9
6.6 DSC AF inspection 6-9
6.7 Troubleshooting 6-10
6.7.1 Procedures for locating malfunctions 6-10
6.7.2 Guide to locating faults 6-11
6.7.3 Consumables 6-12
6.7.4 Repair units/parts 6-12
6.7.5 Regular replacement parts 6-12

7. AFTER-SALES SERVICE 7-1

8. DISPOSAL 8-2

9. SPECIFICATIONS 9-1

9.1 JHS-800S Marine VHF Radiotelephone 9-1
9.2 Channel assignment tables 9-4
9.3 Options 9-9
9.4 Peripheral interfaces 9-10

10.OPTIONS OPERATION 10-1

10.1 Controller (NCM-980) 10-1
10.2 Handset connection box (NQE-1845/1846/1847B) 10-2
10.3 AC/DC power supply (NBD-965) 10-3
10.4 Printer (NKG-980) 10-4

Glossary of terms

This section contains general and DSC terms related to this equipment.

● General terms

AIS (Automatic Identification System)
Equipment that transmits a ship's Maritime Mobile Service Identity number, ship name, ship position, speed, orientation, and other information to and from other ships. AIS equipment is required on some ships by the International Convention for the Safety of Life at Sea (SOLAS)

ATIS (Automatic Transmitter Identification System)
This is used for notification of the radio station ID to receivers when using European inland waterway (IWW) channels.

BAM（Bridge Alert Management）
Bridge Alert Management

CCG (Canadian Coast Guard)
Canadian Coast Guard

DSC (Digital Selective Calling)
Used in routine calls, safety and urgency calls, and distress alerts for rescue request.

GMDSS (Global Maritime Distress and Safety System)
Global Maritime Distress and Safety System

GPS (Global Positioning System)
Global Positioning System

IMO (International Maritime Organization)
International Maritime Organization

Intercom
Wired communications equipment or functionality

ITU (International Telecommunication Union)
The leading United Nations agency for information and communication technologies. Establishes conventions and regulations for all electrical communications. It contains internal organizations such as ITU-R and ITU-T.

ITU-R
The International Telecommunication Union (ITU) radio communications department

IWW (Inland Waterway)
Inland Waterway

LT (Local Time)
Local Time

MMSI (Maritime Mobile Service Identity)
The 9-digit Maritime Mobile Service Identity number assigned to each ship and coast station.

NMEA (National Marine Electronics Association)
Maritime equipment transmission standard established by the National Marine Electronics Association

NNSS (Navy Navigation Satellite System)
Doppler based satellite positioning system operated by the United States Navy.

PA (Public Address)
Sound amplification equipment
In this radiotelephone equipment, it is a function for using an external public address.

PTT (Push To Talk)
Handset button pressed to talk

RCC (Rescue Co-ordinate Center)
In Japan, the Japan Coast Guard.

RMS (Remote Maintenance System)
Transmits ship equipment information temporarily stored in VDR via Inmarsat to land, for use in maintenance and management of radio equipment.

RR (Radio Regulations)
Intergovernmental treaty text of the ITU

SAR Convention (International Convention on Maritime Search and Rescue)
International Convention on Maritime Search and Rescue

SOLAS Convention (International Convention for Safety of Life at Sea)
The international convention applied to all ships engaged on international voyages. A safety certificate is issued if the conditions of this convention are satisfied.

SQL (Squelch)
A function that acts to suppress the audio

output of a receiver in the absence of a sufficient radio strength signal.

Station

A radio station, or a control terminal for radio equipment

USCG (United States Coast Guard)

United States Coast Guard

UTC (Universal Time Coordinated)

Universal Time Coordinated

VDR (Voyage Data Recorder)

After a maritime accident, recovered to analyze the recorded data (speed, rudder, bridge conversation, VHF audio, etc.) to determine the cause of the accident.
It can also transmit navigation management data regularly via Inmarsat to land.

VHF (Very High Frequency)

Very High Frequency (30 - 300MHz)

VOL (Volume)

Internal speaker volume

WRC (World Radiocommunication Conference)

World Radiocommunication Conference

WMO (World Meteorological Organization)

World Meteorological Organization

WKR (Watch Keeping Receiver)

Dedicated receiver for CH70 to watch the DSC signals.

● DSC terms

Address

General term for Maritime Mobile Service Identity number (MMSI)
This equipment uses TO/FROM to distinguish between the sender and receiver. It also means the SELF-ID (own ship MMSI) and DIST-ID (MMSI of a ship in distress).

Category

Message code indicating priority of the call.
It contains types as below.

- ROUTINE ....General calls for routine works
- SAFETY.....Safety communications call
- URGENCY...Urgent communications call
- DISTRESS...Distress alert

DROBOSE

Distress relay call (to individual or to area) on behalf of someone else who is in distress.

EOS (End Of Sequence)

Termination code appended to the call messages.
It contains types as below.

- EOS .....End of sequence
- ACK RQ.....Acknowledgement request
- ACK BQ.....Acknowledgement responding to the ACK RQ

ECC (Error Check Character)

Er*ror check code appended to the end of call* me*ssages.*
This is not normally displayed, but if an error occurs, one of the following will be displayed.

- ECC ERROR..... Message error
- EX ECC ERROR....Expansion message error

Format

Message code indicating type of call.
It contains types as below.

- Individual call.....Individual call
- Individual ACK.....Acknowledgement response to individual call
- Individual NACK....Negative acknowledgement response to individual call
- Semi/auto call.....PSTN connection call
- Semi/auto ACK.....PSTN call acknowledgement
- Semi/auto NACK...PSTN call negative acknowledgement
- Group call.....Call to ships having common interest
- All ships call.....Call to all ships
- Distress .....Distress alert

Natu*re* of Distress

Message code indicating type of distress when a distress call is issued.
It c*ontains types as below.*

- FIRE .....Fire, explosion
- FLOODING.....Flooding
- COLLISION .....Collision
- GROUNDING .....Grounding
- LISTING .....Risk of ship capsizing
- SINKING.....Sinking
- DISABLED.....Ship inoperable/adrift
- UNDESIGNATED .....Undesignated distress
- ABANDONING .....Abandoning ship
- PIRACY ATTACK.....Piracy attack

- MAN OVERBOARD . Man overboard
- EPIRB EMISSION.... DSC VHF EPIRB reception

Polling

Polling is a feature for routine calling.
It is used, for example, to confirm whether a ship is existing within radio range when a coast station requests navigational information to the ship.

PSTN (Public Switched Telephone Network)

General fixed landline telephone network.

Reason

Message code indicating reason for negative acknowledgement response.

- NO REASON ..... No reason
- CONGESTION..... Maritime information exchange center congested
- BUSY ..... Busy
- QUEUE ..... Queued
- BARRED..... Station barred
- NO OPER ..... No operator
- TEMP NO OPER .. Temporarily no operator
- EQP DISABLED.... Equipment disabled
- UNABLE CH ..... Indicated channel cannot be used
- UNABLE MODE… Indicated mode cannot be used

Subject

Message code clarifying communication contents when sending an urgency call to all ships.
When sailing dangerous waters, such as political instability, these call messages with the following information are used.

- Neutral ship..... In accordance with ITU resolution 18 (Mob-83), inform all ships that own ship is of neutral nationality.
- Medical TRNSP .... Inform all ships that own ship is performing medical transportation, and is protected under the 1949 Geneva Convention.

Type

Main contents of call message.
Normally, the 1st telecommand will be indicated, but for a distress related call, it may also take into account the Format and the EOS. Displayed when message is received, as well as in LOG.

- ALL MODES RT ..... All F3E/G3E radiotelephones
- SEMI-DUPLEX RT... Semi-Duplex F3E/G3E radiotelephones
- POLLING ..... Polling
- DATA ..... Data transmission
- POSITION RQ ..... Ship position request
- SHIP POSITION ..... Ship position notification
- TEST ..... Safety test call
- UNABLE TO COMPLY..... Negative acknowledgement
- DISTRESS..... Distress message
- DISTRESS ACK ..... Acknowledgement of distress message
- DISTRESS RELAY .. Distress relay message
- DIST-RELAY ACK.... Acknowledgement of distress relay message

Work CH

Message code indicating a work channel to communicate using radiotelephone.

1. EQUIPMENT OVERVIEW

1.1 Functions

This equipment includes VHF radiotelephone, Class-A DSC and DSC watchkeeping receiver required as the Global Maritime Distress and Safety System (GMDSS). It is designed as a compact, integrated unit that does not require a cable to connect the transceiver and controller; plus the controller is also compact and lightweight. It is intended for easy installation in non-regulated ships under 300 tons, more so than regulated ships (IMO regulated passenger ships and cargo vessels over 300 tons).
This equipment has standard functions that include regular transmissions and DSC (digital selective calling) for distress transmissions, as well as functions to playback and record transmissions in real-time and an easy-to-operate self-diagnosis function. Additionally, various optional functions are available, such as a public address function to output speech through the handset by connecting an external speaker; an intercom function for communication from the main unit to controllers and between controllers; and a DSC calling function that uses other ships' information acquired by connecting your own ship's automatic identification system (AIS).

1.2 Features

- Compliant with the ITU Radio Regulations (RR), the IMO performance standards, and the ITU-R recommendations.
- Contains all channels specified in the ITU Radio Regulations (RR).
- In addition to channels specified in the ITU Radio Regulations (RR), this equipment also provides USA, Canada, European inland waterway, and weather channels. It also allows the use of up to 200 private channels.
- Contains ATIS (Automatic Transmitter Identification System) function for the inland waterway channels.
- The transceiver and controller are built in a compact, integrated format, and the controller is also compact and lightweight to enable easy installation in limited spaces.
- A totally transmissive LCD with a wide viewing angle is easily viewable, even with straight light or back lighting and allows it to be installed in a variety of positions for easy viewing and operability.
- The backlights of the LCD and operation buttons are fully adjustable, preventing interference while keeping night watch.
- Intuitive operations can be done on the touch screen.
- The DSC has the automated procedure mentioned in the Recommendation ITU-R M.493 to supply the easy operation such as the suitable menu/indication for the ongoing procedure. Also, routine calls can be sent quickly by just selecting the other party's station.
- When in distress, the DSC can send the distress message with the expanded position data containing the digits up to 1/10000 of minutes for both latitude and longitude to make search and rescue operation by the RCC easier.
- The received voice recording and playback function enables later confirmation or temporary saving of communications.
- An advanced digital audio amplifier with a built-in loud speaker provides 6 W max of clear audio.
- Hands-free operation is possible by using a Bluetooth handset.
- Daily maintenance and inspections are easy to do by using the simple to operate self-diagnosis function.
- Besides printers and GPS, other peripherals such as the AIS, the VDR, and/or remote maintenance systems (RMS) can be connected to this equipment.

1.3 Basic configuration

1.3.1 Basic configuration of the main unit

No.	Product Name	Model Name	Qty	Notes
1	Marine VHF Radiotelephone	JHS-800S	1	Simplex/Semi-duplex model
2	Handset	NQW-980	1	Includes the cradle
3	Power cable	CFS-810	1	For connecting DC power, 2.5 m long
4	Instruction Manual	7ZPJD0714	1	This manual

1.3.2 Options

No.	Product Name	Model Name	Notes
1	TRX Antenna	7ABJD0004	1.29m Dipole type
2	WKR Antenna	7ABJD0004	1.29m Dipole type
3	Antenna mounting bracket	MPBX41928A	Used for each antenna
4	Coaxial connector	N-P-10U	
5	AC/DC Power supply	NBD-965	
6	VHF Controller	NCM-980	Possible to expand to a maximum of 4 units
	Mounting bracket	MPBX50191	For VHF controller
7	Handset	NQW-980	Waterproof type (IP66 equivalent)
8	CQD-10 Connector Box	CQD-10	12 terminals
9	CAN cable	CFS-830	For connecting JHS-800S and NCM-980, 5 m long
10	AUX cable	CFS-820	For AF output/input, 2.5 m long
11	Handset connection box	NQE-1845	Wing console/ waterproof type (IP66 equivalent)
12	Handset connection box	NQE-1846	Waterproof wing installation type (IP66 equivalent)
13	Handset connection box	NQE-1847B	Indoor flush mount type (black)
14	Handset extension cable	CFQ-5397	10 m long
15	Handset extension cable	CFQ-5398	20 m long
16	Wireless handset	-	Bluetooth connection
17	Printer	NKG-980	Desktop type (LAN connection)
	Printer power cable	CFS-810	
	Printer paper	7ZPJD0384	
	Wall mounting bracket	MPBC52168	
18	External speaker	NVS-423R	Wall mount or flush mount type
19	Distress message controller	NCH-3210	(LAN connection + LAN /IO converter)

1.3.3 System configuration

JHS-800S Marine VHF Radiotelephone

NBD-965 Power Supply

NCM-980 Controller

AIS

GPS

NVS-423R Speaker

Waterproofed Handset Connection Box

Indoor Handset Connection Box

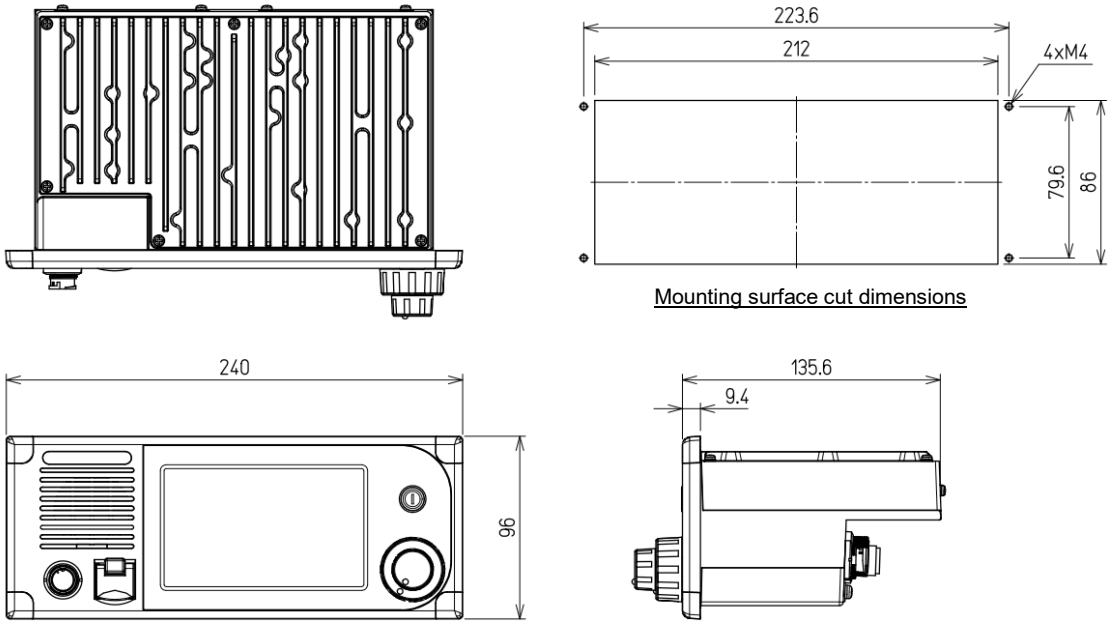
Waterproofed Handset Connection Box

* The radiotelephone can also be used with connected remote maintenance systems, BAM, VDR and printer equipment.

1.4 External dimensions

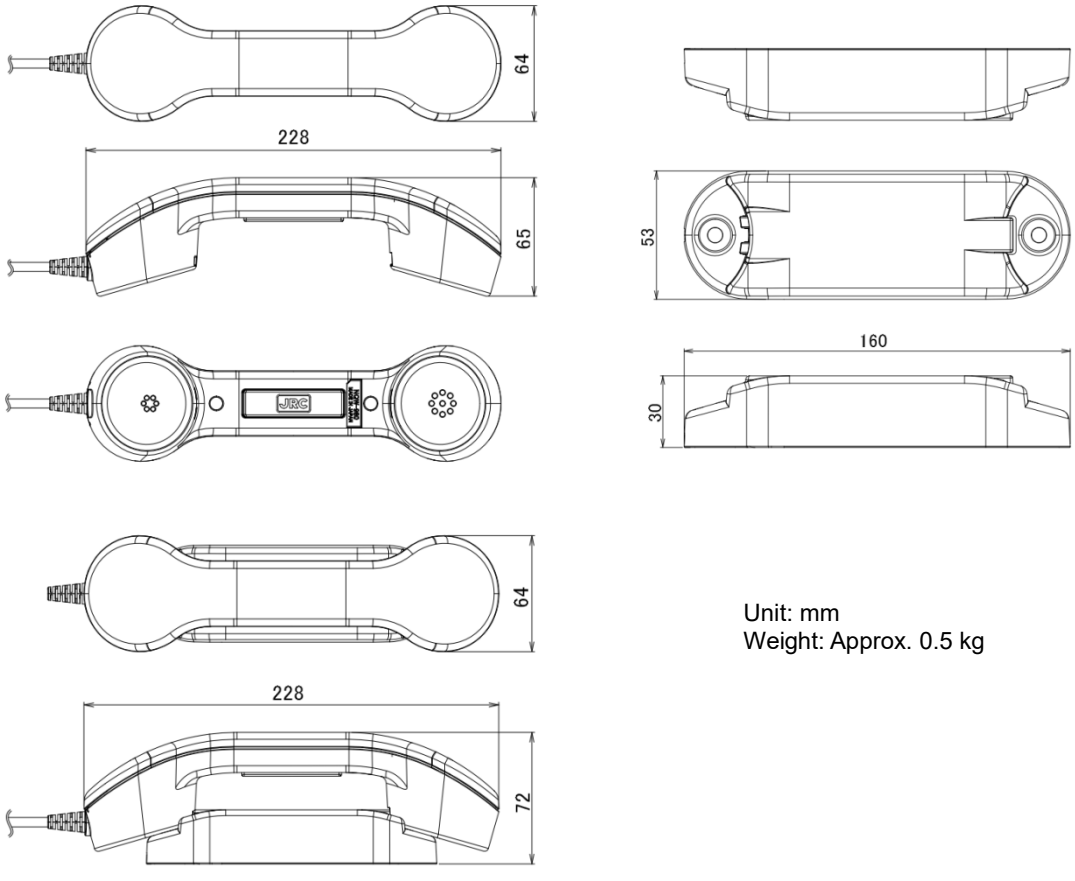
Below are the external dimensions of each unit.

(1) Marine VHF Radiotelephone (JHS-800S)



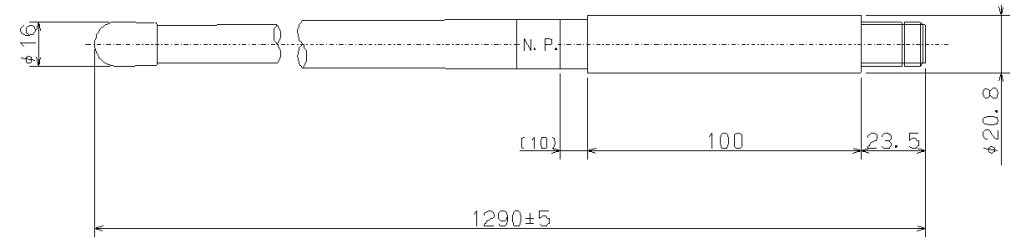
Unit: mm
Weight: Approx. 2.1 kg

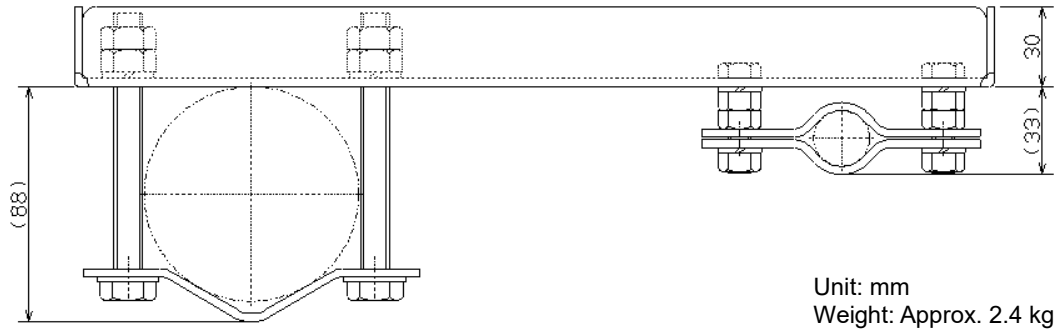
(2) Handset (NQW-980)



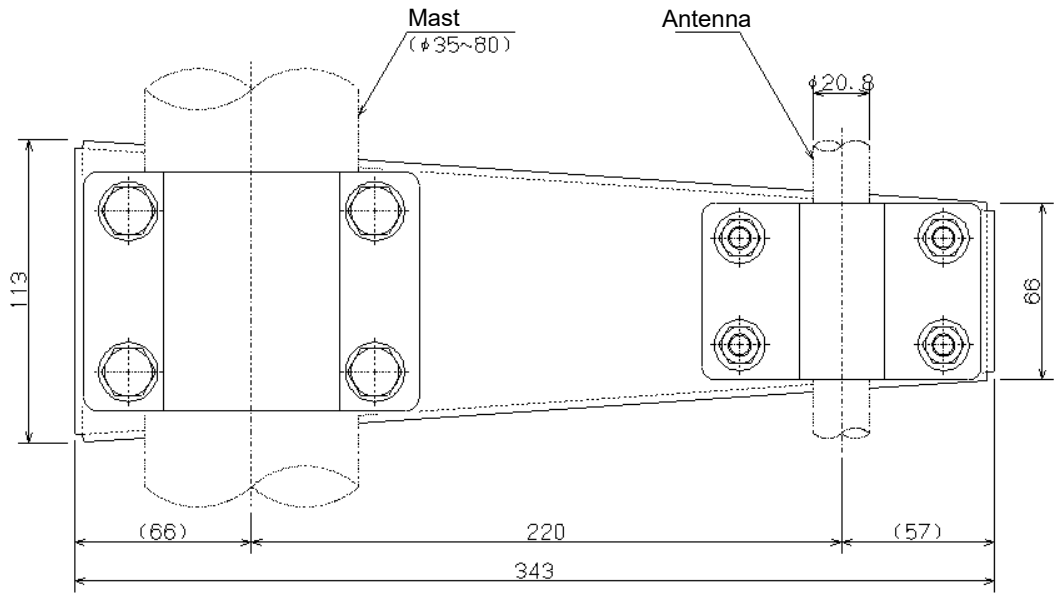
Unit: mm
Weight: Approx. 0.5 kg

(3) Antenna (7ABJD0004) and Mounting bracket (MPBX41928A)

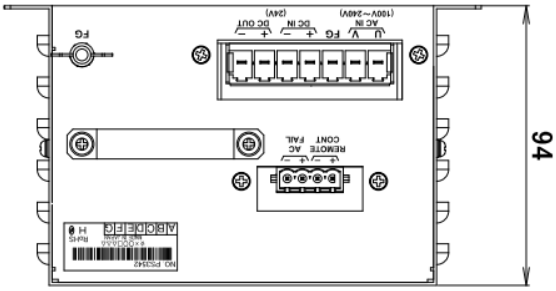


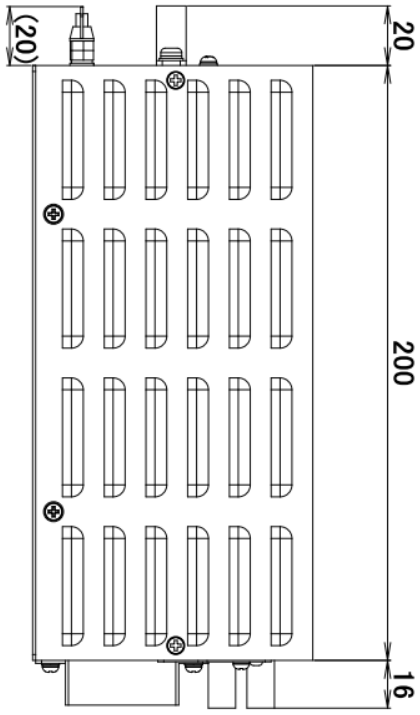


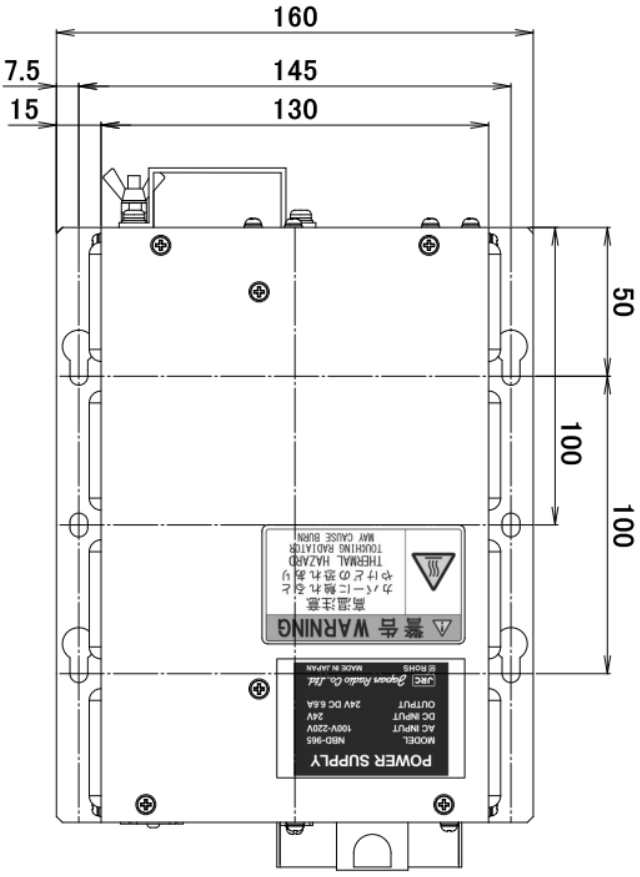
Unit: mm
Weight: Approx. 2.4 kg

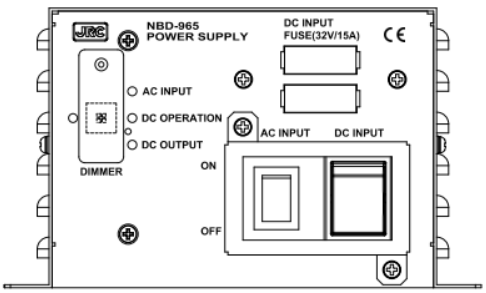


(4) AC/DC power supply (NBD-965)



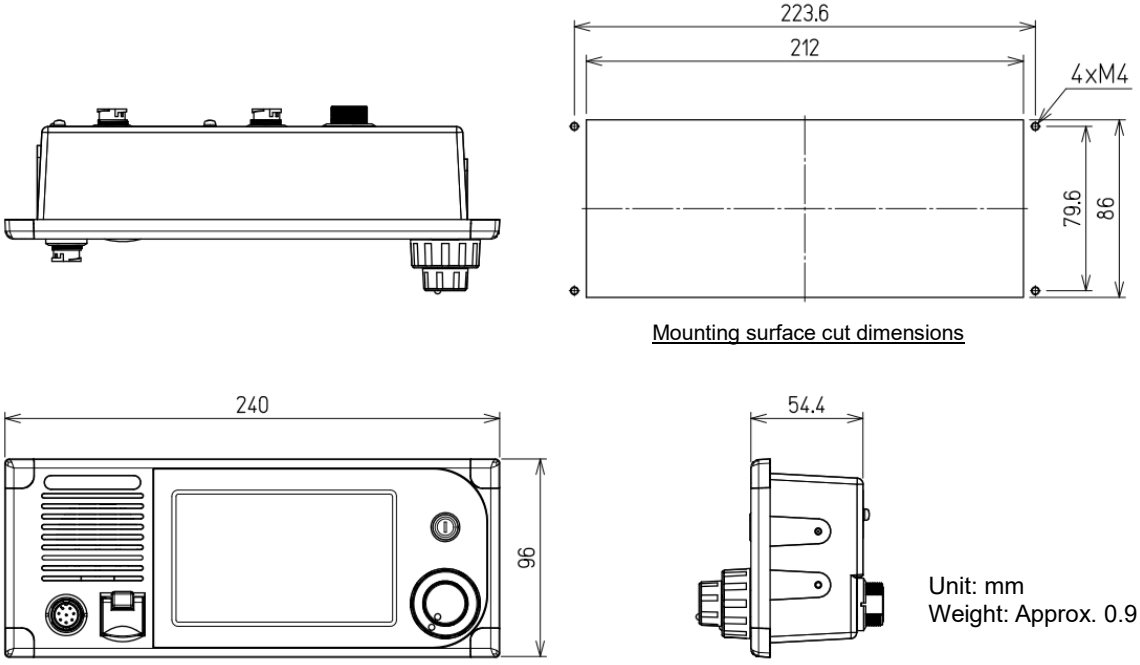






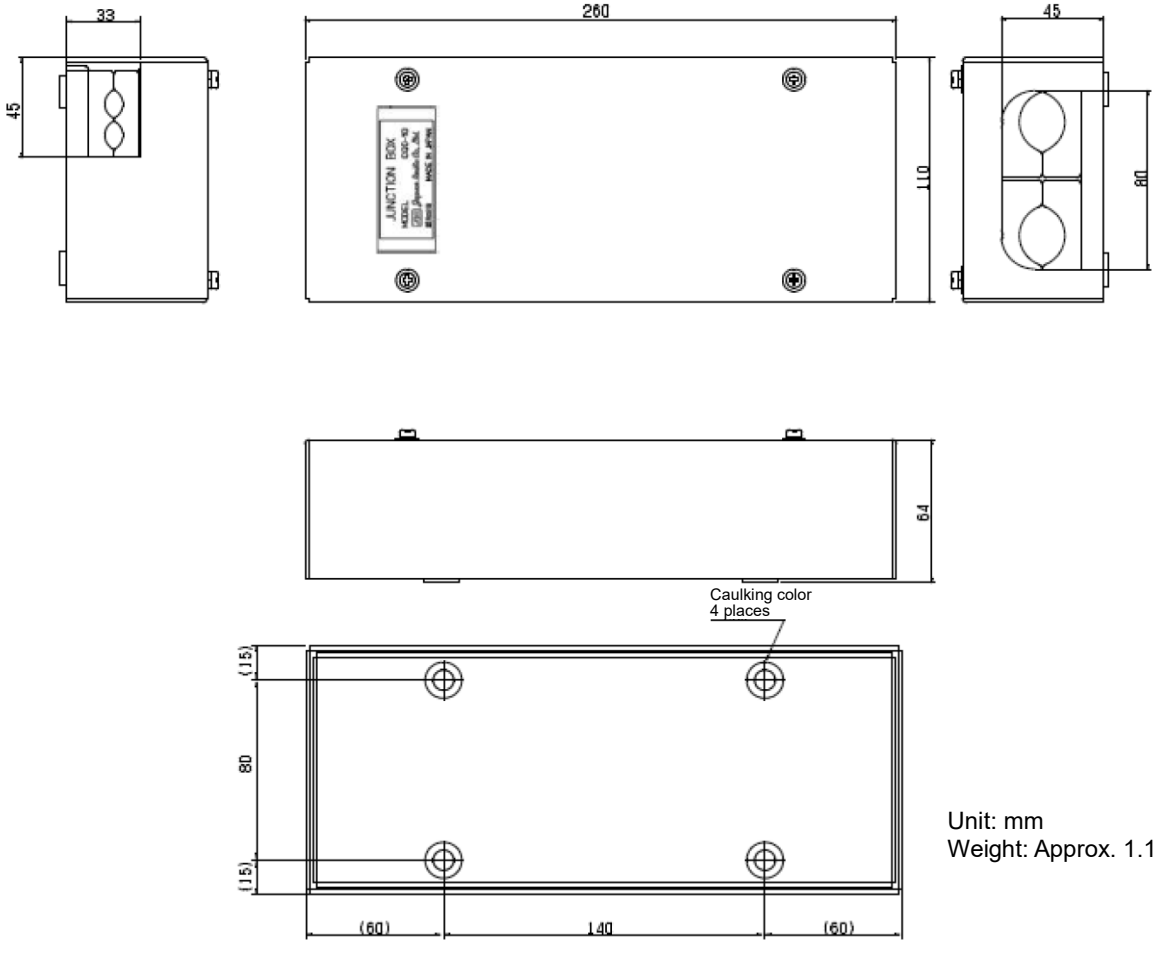
Unit: mm
Weight: Approx. 2.1 kg

(5) VHF Controller (NCM-980)



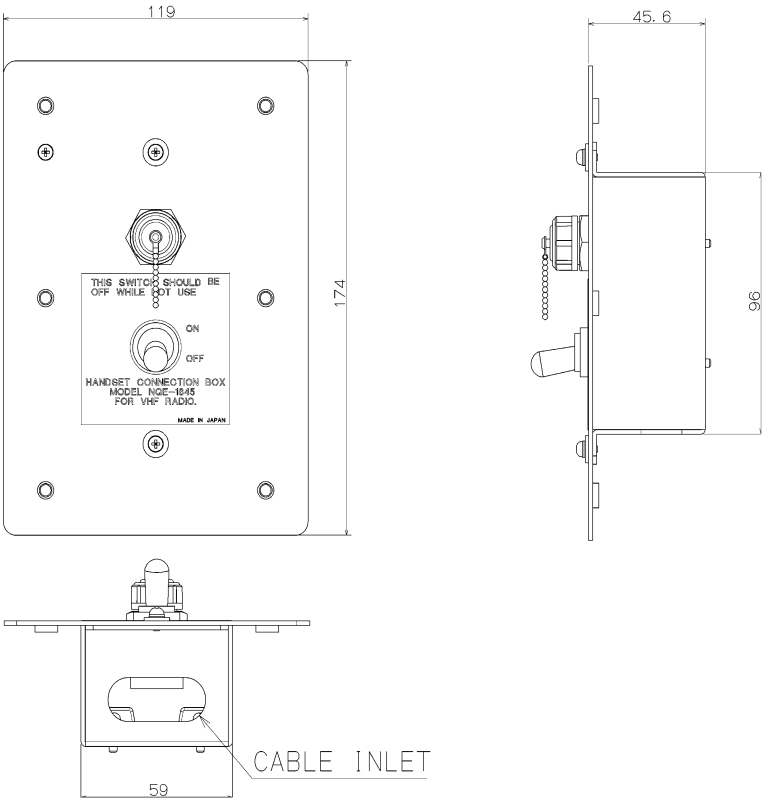
Unit: mm
Weight: Approx. 0.9 kg

(6) Connector box (CQD-10)



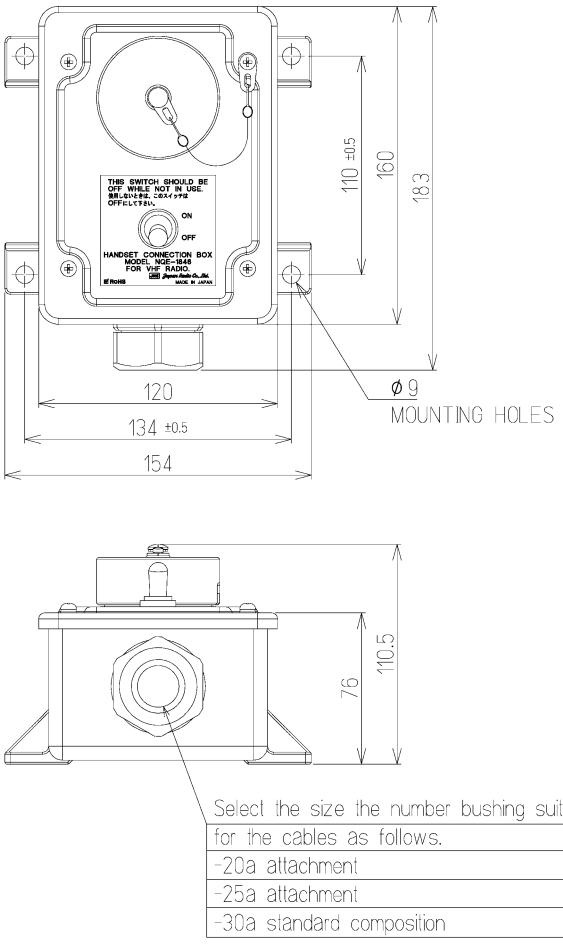
Unit: mm
Weight: Approx. 1.1 kg

(7) Handset connector box (NQE-1845)



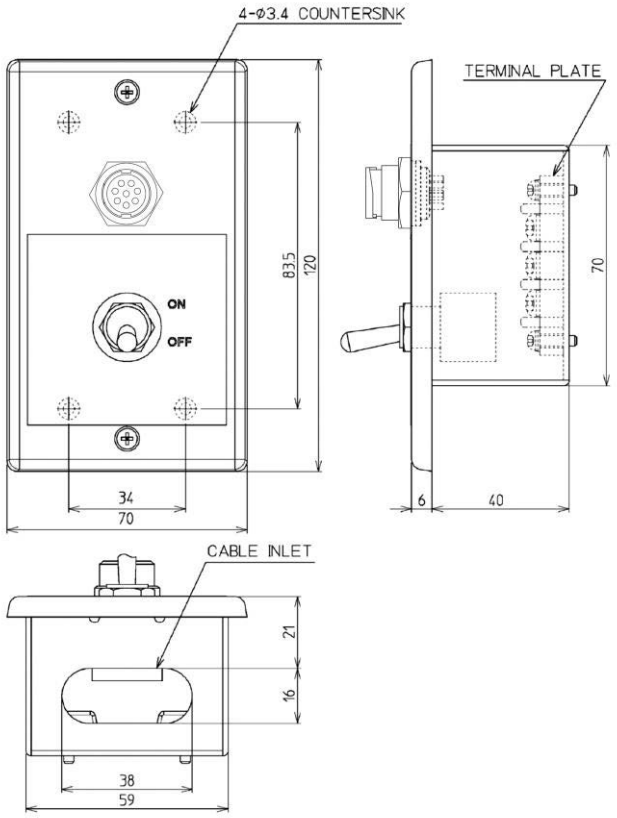
Unit: mm
Weight: Approx. 0.5 kg

(8) Handset connector box (NQE-1846)



Unit: mm
Weight: Approx. 1.1 kg

(9) Handset connector box (NQE-1847B)

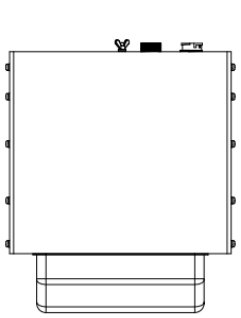


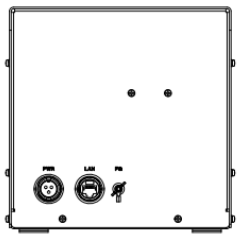
Unit: mm
Weight: Approx. 0.3 kg

(10) Printer (NKG-908)

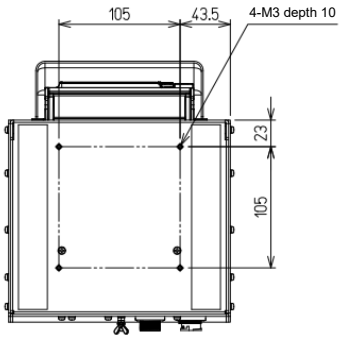
●Desktop type

Unit: mm
Weight: Approx. 2.8 kg

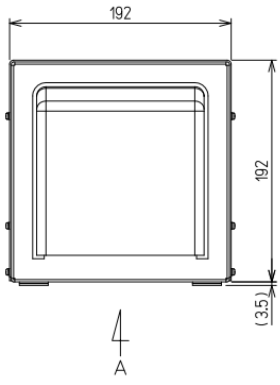


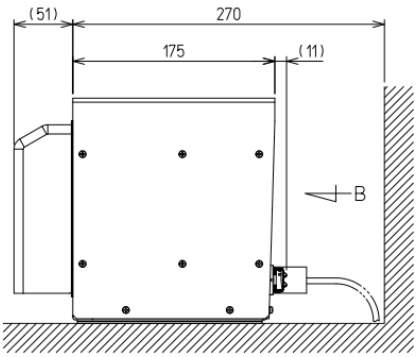


VIEW B

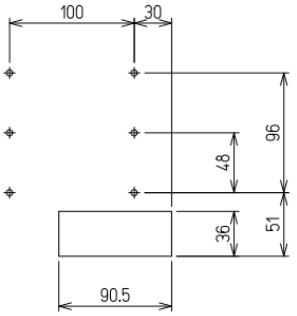


VIEW A



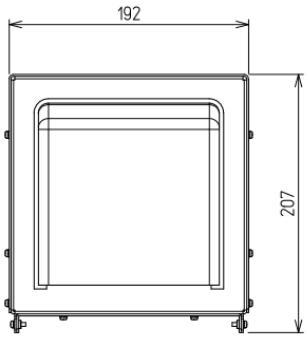


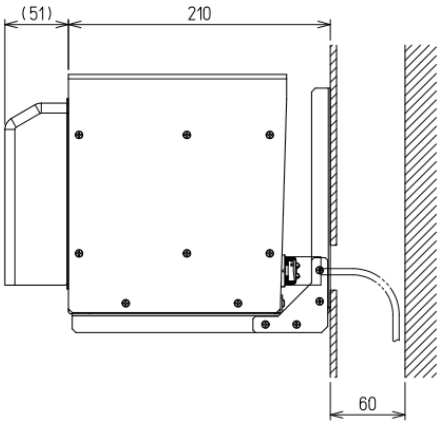
●Wall mount type



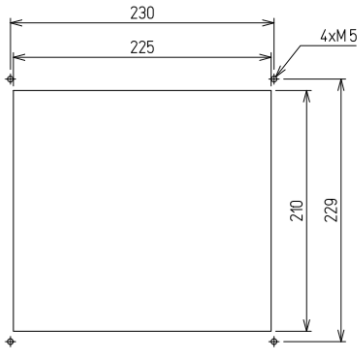
Unit: mm
Weight: Approx. 3.8 kg

Cut dimensions on Mounting surface



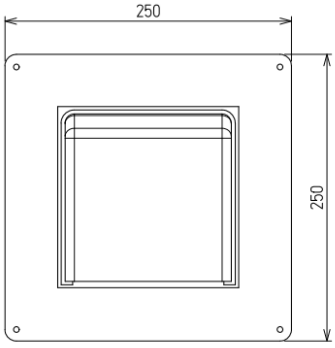


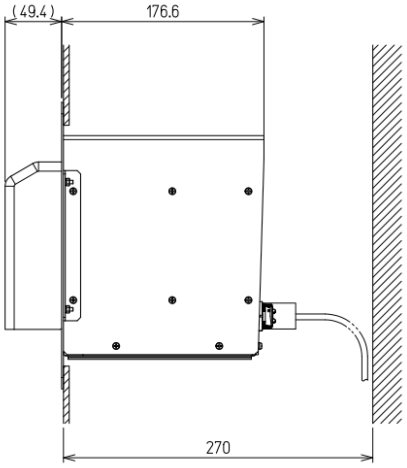
●Flush mount type



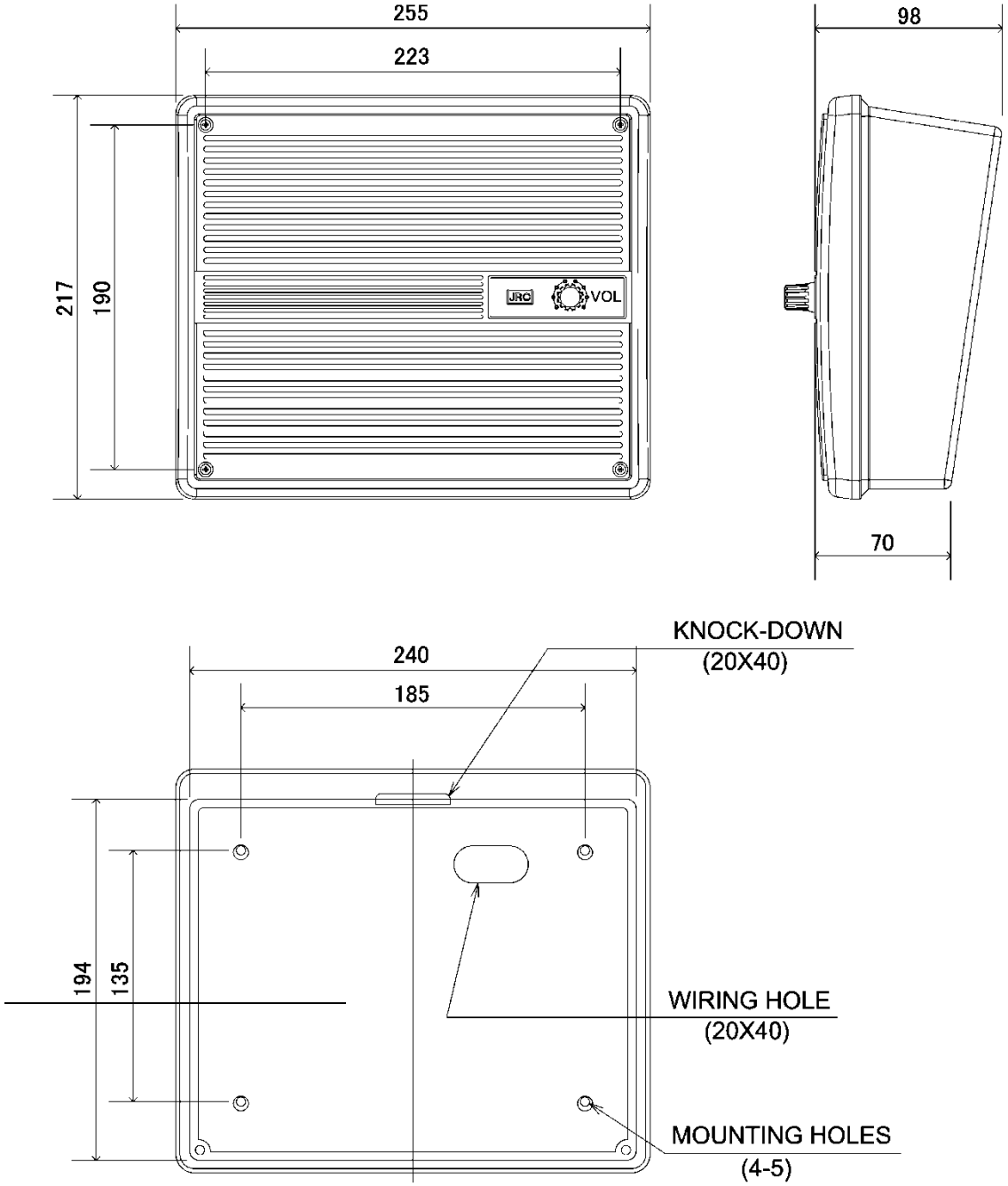
Unit: mm
Weight: Approx. 3.4 kg

Cut dimensions on Mounting surface



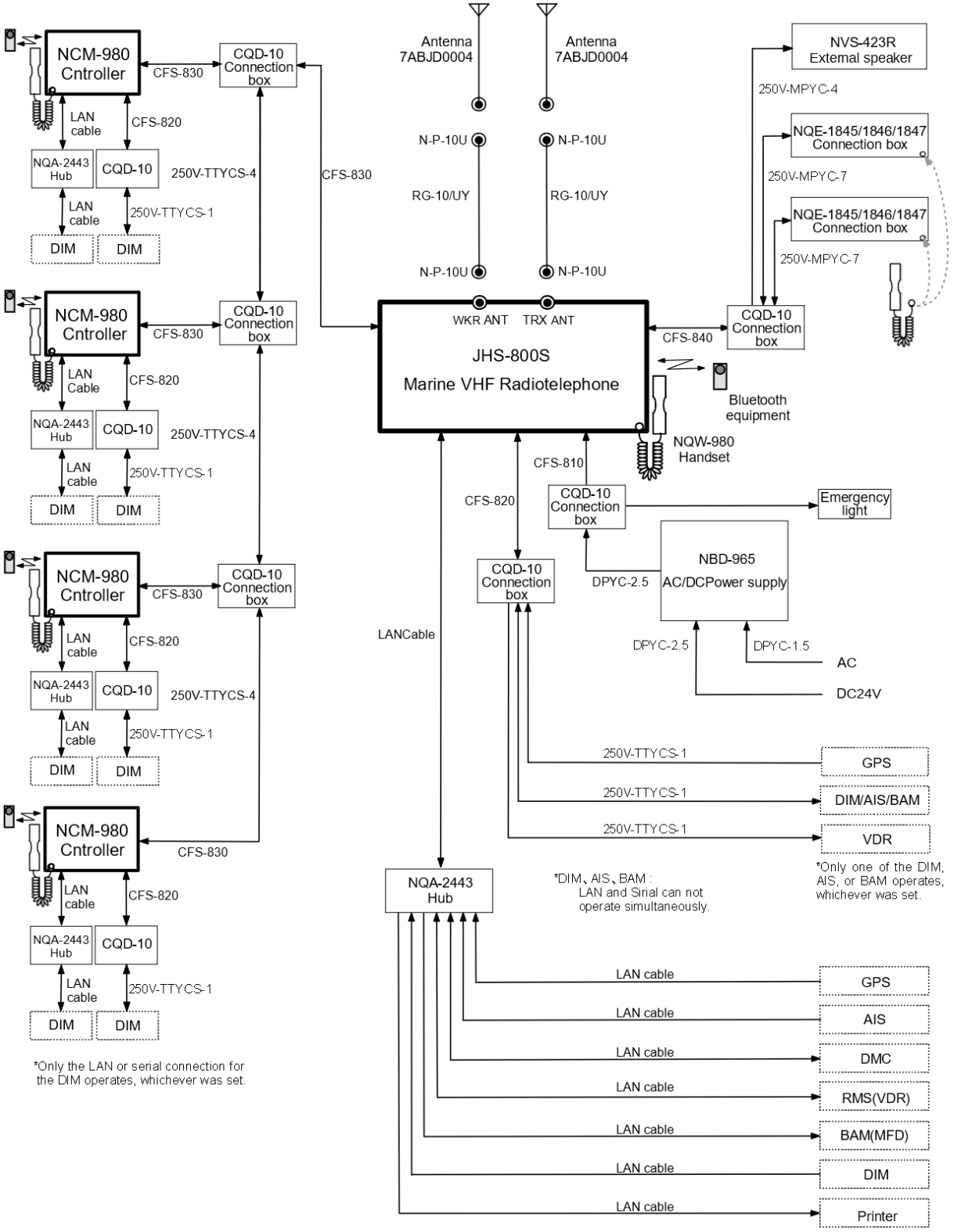


(11) External speaker (NVS-423R)



Unit: mm
Weight: Approx. 1.1 kg

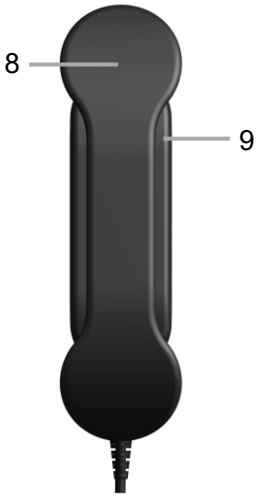
1.5 Block diagram



2. NAMES AND FUNCTIONS

2.1 Main unit (JHS-800S) and Controller (NCM-980)

The main unit's parts and their functions are described below.



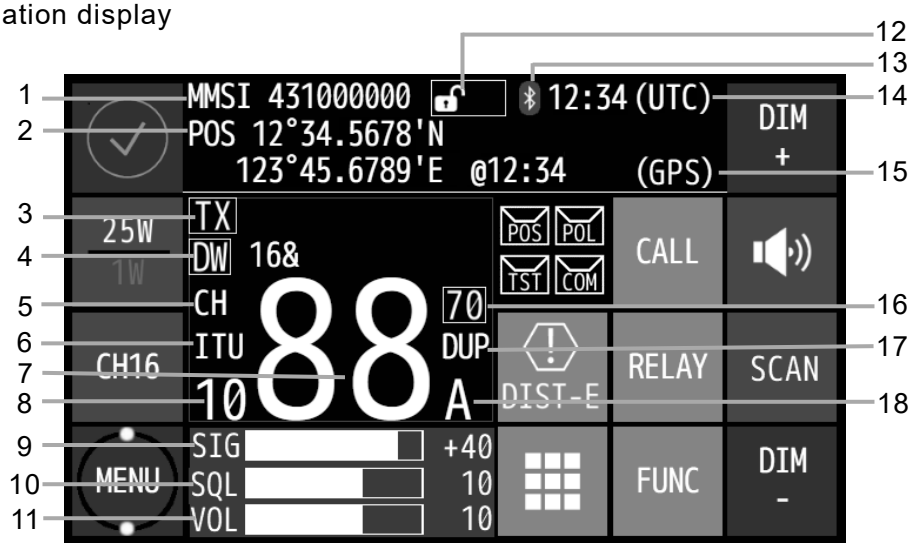
1. **Internal loud speaker**
2. **Handset connector**
3. **DISTRESS button**
   When in distress, sends a DSC distress alert after pressing for 4 seconds.
4. **Color LCD display (touch panel)**
   Use the touch panel to do button operations.
5. **PWR button**
   Turns the power on and off.
6. **SQL (Squelch) control**
   Adjusts squelch level.
7. **VOL (Volume) control**
   Adjusts built-in loud speaker volume.
8. **Handset**
   When using in radiotelephone mode, press and hold the PTT key to talk.
9. **Cradle (for handset)**

2.2 Main displays

The LCD screen changes according to current conditions. This section describes the status display, menu screen, and the incoming screen for DSC messages.

2.2.1 Status display

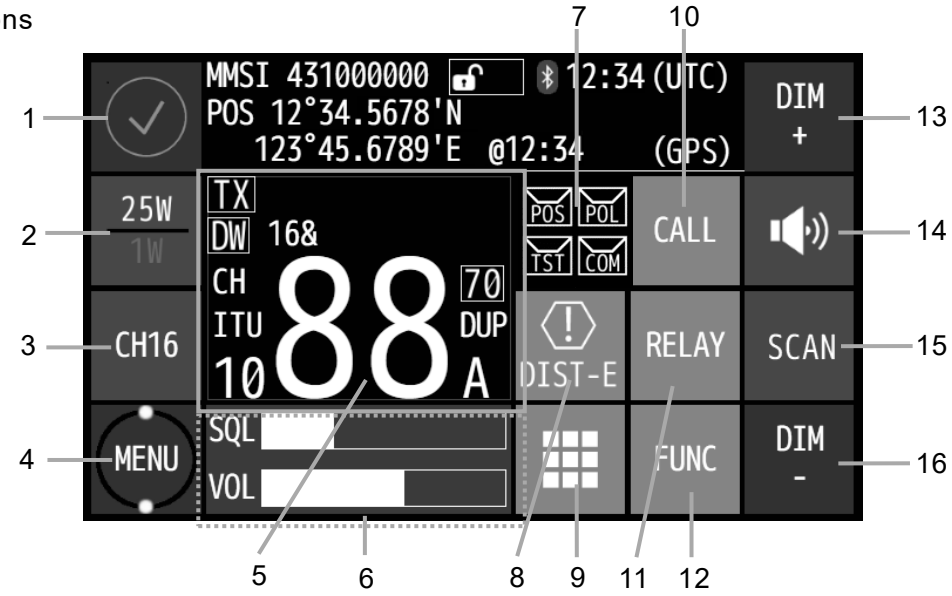
(1) Information display



1	Indicates the ship's MMSI.
2	Indicates own ship's position and that time.
3	Transmitting, VSWR err or PLL unlocking mark. • Transmitting: TX • Bad VSWR at TX: TX VSWR • PLL unlocking: UNLOCK
4	On scanning, indicates the current condition. • Scanning: 16& • Dual Watch: DW 16& • During triple watch: TW 16& TW's changer switches every second.
5	Indicates the channel category as follows. • Priority channel, CH70: CH • Other channel: CH
6	Indicates the region type of a current channel. • ITU channel: ITU • USA channel: USA • Canada channel: CAN • European inland waterway channel: IWW • Private channel: P0/P1/P2
7	Indicates the current channel.
8	Indicates the first two digits if the channel that is set has four digits.
9	Indicates the receiving signal strength indicator.

10	Indicates the level of the squelch. Or, indicates the status as follows. • Closed: SQL • Opened: SQL • Closed by Preset SQL: PSQ • Opened by Preset SQL: PSQ
11	Indicates the level of the speaker's volume. ※When the internal temperature rises the volume limitation is done automatically, the display becomes VOL and the level changes to yellow.
12	Indicates the status of the access rights. • Occupied: • Non Occupied: OCC
13	Indicates the status of the Bluetooth. • Connected: • Non connected:
14	Indicates current time as follows. • Universal time coordinated: UTC • Local time: LT
15	Indicates the source of the ship's position. • External device (e.g. GPS): (GPS) • Manual input: (MAN) • No input: NOGPS
16	Indicates CH70 watching continuously by the DSC watchkeeping receiver. It turns red when WKR is out of order.
17	Indicates if the currently selected channel is a semi-duplex channel that can only communicate with a coast station.
18	Indicates the channel ID letters for the USA or Canada region channel mode.

(2) Buttons

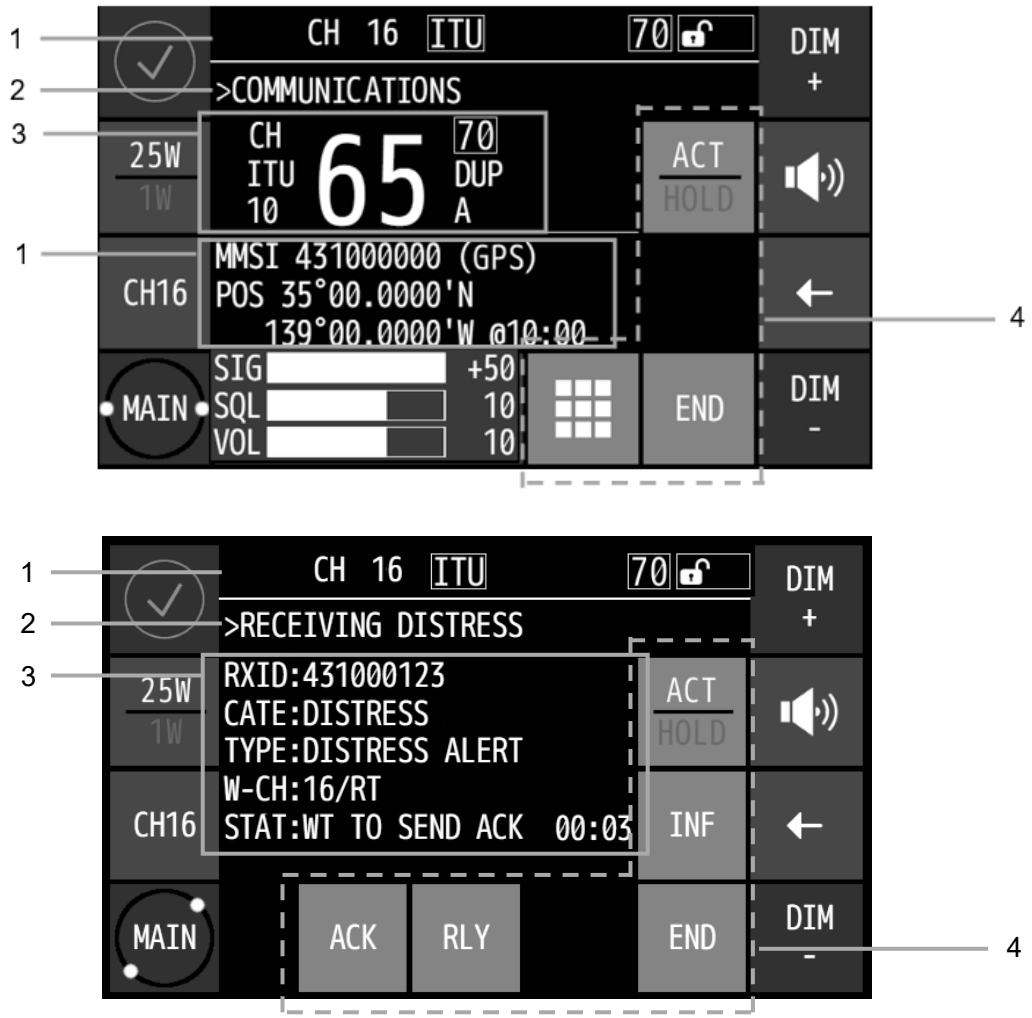


1		Displays the alarm information screen.
2	25W 1W	Switches transmitting power between 25 W and 1 W.
3	CH16 OPE	CH16: Sets the radiotelephone to CH16. OPE: Acquires the access rights.
4	MENU	Displays the menus screens. Indicates using freeze indicator that the system is operating.
5		Displays the numeric key pad (input 0 to 9) for selecting channels.
6	SQL VOL SIG +50 SQL 10 VOL 10	Switches the S meter display from hide to show. The range of the level is as follows. SIG: -20～+50, SQL: 1～15, VOL: 0～15
7	POS POL TST COM	Indicates the DSC auto ACK conditions. • POS: Position request call • POL: Polling call • TST: Safety test call • COM: Communication request call* *Responds automatically (unable to respond) only when requested on a disabled channel. Under communication (active or on hold), it becomes [CALL LIST] button to display the communication selection screen. (Refer to 2.2.2 Operating display).
8	DIST-E	Displays a menu for editing and sending distress messages.
9		Displays the numeric key pad (input 0 to 9) for selecting channels.
10	CALL	Displays the screen for normal calls.
11	RELAY	Displays the screen for relaying distress calls.
12	FUNC	Displays the shortcut buttons for various functions.
13	DIM +	Adjust a dimmer level of the LCD screen in 15 levels.
14		Turns speaker on or off. * “EQ” is displayed when the equalizer function is activated.
15	SCAN	User defined key. Register a desired and assignable menu (e.g. frequently using) or a special function. The scanning function is assigned to it as the initial setting.
16	DIM -	Adjust a dimmer level of the LCD screen in 15 levels.

2.2.2 Operating display

(1) General

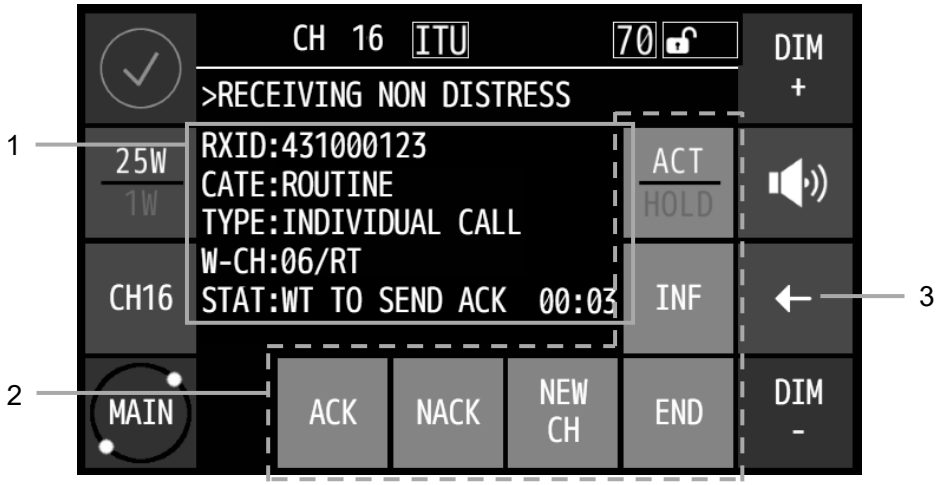
The display on the main unit shows the operation screen shown below if a DSC is sent or received, the handset is operated (PTT is pressed), while the status screen is displayed.



1	Displays the standard information on the status screen.
2	Communication or Displays menu items and DSC messages being received.
3	Communication or Displays the DSC message information.
4	Shows the operation buttons.

(2) Operating display of DSC calls

When communicating using DSC messages, the controller shows as follows.



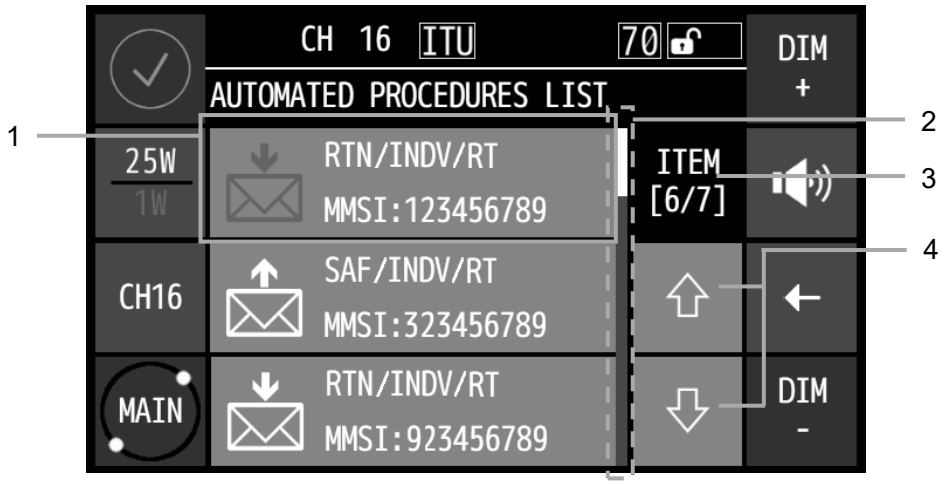
1	Displays the DSC message information. RXID or TXID : Shows the sender's or other receiver's identification number (MMSI). Additionally, the following special marks may be indicated on this line. E Indicates when including the ECC error in the message. D Indicates when the DSC procedure is started by receiving a delayed ACK from a deleted call. CATE: Indicates the category. ROUTINE, SAFETY, URGENCY, or DISTRESS TYPE: Indicates the type of distress. DISTRESS, GROUP, ALL SHIPS, INDIVIDUAL, DISTRESS RLY, or NO INFORMATION (Other information: ACK or NACK) W-CH: Indicates the work channel and mode, according to the DSC message. STAT: Indicates the elapsed time and the status of the procedure in response to the DSC message.
2	Shows the operation buttons. [ACK]: Accepts the call and sends ACK. [NACK]: Sends “unable to comply”. [NEW CH]: Sends ACK with new work FRQ. [INF]: Displays the received message (details). [ACT/HOLD]: Puts the active call on hold/active. [END]: Terminates the call.
3	Touching this button displays the communication selection screen (refer to the following).

Note

- The automatic response function for messages received on the DSC watchkeeping receiver are disabled to prevent accidental transmission while there are active communications.
- When sending the “able to comply” acknowledgement against the received message requesting the radiotelephone communication, lifting handset is also available as a substitute for selecting the ACK handling menu.
- When selecting the NEW CH or NACK menu, the dedicated popup screen is appeared.
- When sending an acknowledgement automatically to the receiving calls such as position request, safety test, polling, or the call requesting communication with an invalid channel, the above screen is shown and starts sending automatically. After finishing it, that screen is closed automatically.

●About the communication selection screen

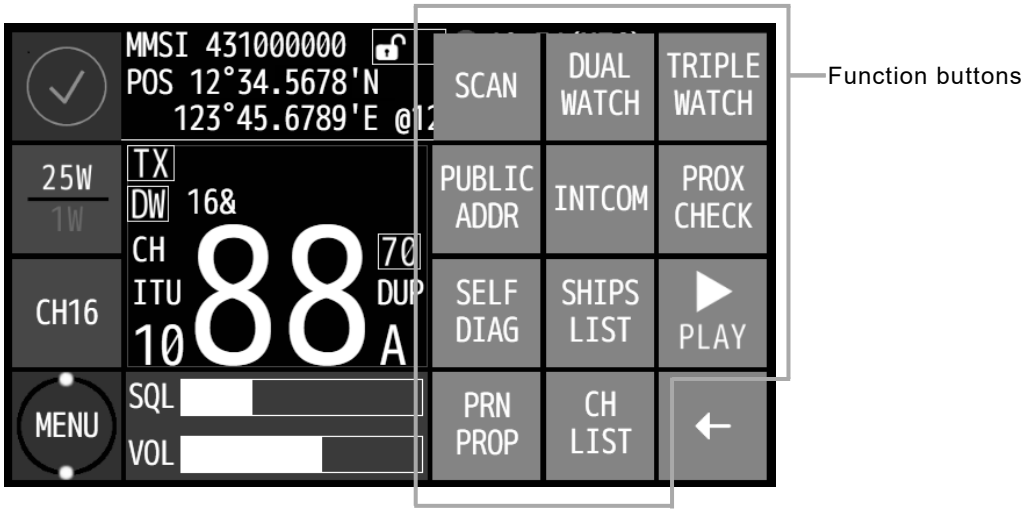
Under communication (active or on hold), the [CALL LIST] button is displayed on the Status display (Refer to 2.2.1 Status display). Touch this [CALL LIST] button to display the communication selection screen.



1	[List] button: Select the communication* (*Refer to (4) Operations in the list display in 2.2.4 Menu screen.) Procedures type: Received DSC..., Sending DSC..., Communication... Procedures state: Blue while operating (active), white while on hold Overview of the DSC message Address Types: INDV(INDIVIDUAL), GRP(GROUP) , ALL(ALL SHIPS) Category or DST type: RTN(ROUTINE), SAF(SAFETY), URG(URGENCY), DIST(DISTRESS), DIST RLY(DISTRESS RELAY) Other: ACK or NACK MMSI: Own ship's identification number
2	Scroll bar
3	Number of communications: X/7: Where X is the number of communications that have been saved and 7 is the maximum number that can be saved
4	[↑]/[↓] buttons: Scroll the list.

2.2.3 Function screen

Displayed when you touch the [FUNC] button in the status screen.



Shows the operation buttons that have been registered.

Touching these buttons takes you to their various functions.

The following are the initial settings when shipped from the factory.

[SCAN]:	Displays the scan menu.
[DUAL WATCH]:	Starts the dual watch.
[TRIPLE WATCH]:	Starts the triple watch.
[PUBLIC ADDR]:	Starts the public address mode.
[INTCOM]:	Displays the intercom menu.
[PROX CHECK]:	Notification of registration vessel by AIS.
[SELF DIAG]:	Displays the self-diagnosis menu.
[SHIPS LIST]:	Display of other ship list by AIS
[PLAY]:	Starts playback the recorded data.
[PRN PROP]:	Printer Properties.
[CH LIST]:	Displays the memory CH list.
([←]:	Return)

2.2.4 Menu screen

(1) Menu screen

Touching the [MAIN] button in the status screen displays the Main menu screen.

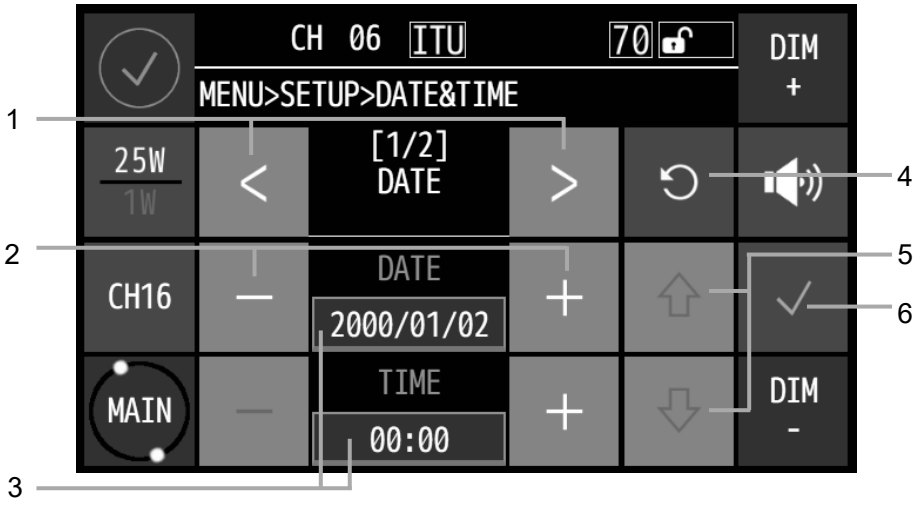
1	Indicates that the squelch is on while the main menu is displayed. TX appears while transmitting.
2	Indicates the current menu name.
3	Shows the menu buttons.
4	Shows the current channel, channel designation, SCAN/DW/TW, CH70 listening, access rights, etc.

Touching the menu buttons displays their various menu screens.

(2) Button operations

The following buttons do the same operations in all the menu screens.

(This explanation uses an example of manually setting the date and time.)



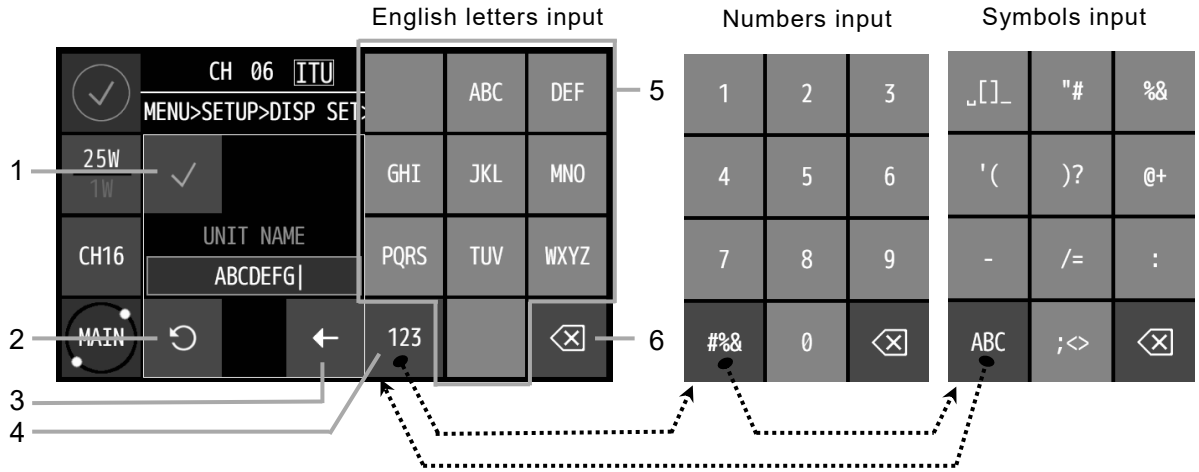
1	< > (change page) buttons ([<]/[>]) buttons	Changes the pages when a menu has multiple screens (pages).
2	− + (plus/minus) buttons ([-]/[+]) buttons	Increase and decrease numbers and move selections.
3	DATE 2001/01/02 TIME 00:00 (editing) buttons	Changes to the text input screen. (Enabled when a blue line appears at the bottom.)
4	(undo) button	Cancels the previous operation and returns to the previous status. (If there are no changes in the data, it is not shown.)
5	(scroll) buttons ([↑]/[↓]) buttons	Scroll through lists.
6	(Enter) button	Saves settings or changes to content. (If there are no changes to the data, the [Return] button is displayed.)
	(return) button	Returns you to the previous screen.

(3) Text input operations

Text input includes English letters, numbers, and symbols.

It is possible to switch the input type suitable for the function.

The operation buttons and button functions are shown below.



1	(Enter) button	Enters settings or changes to content.
2	(undo) button	Cancels the operation and returns to the previous status.
3	(return) button	Returns you to the menu screen.
4	123 #%& ABC (change type of characters) buttons	Changes the type of characters that are input. • [123] button → Number input • [#%&] button → Symbols input • [ABC] button → English letters input *If the input type is one kind, it will not be displayed or it will be another operation button..
5	Numeric key pad	Input letters of the English letters (upper and lower-case letters), numbers, symbols.
6	(BS) button	Deletes one character.

(4) Operations in the list display

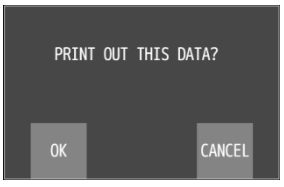
You can select a list in the list display by touching that list.

(This is explained with an example of operations for COAST on the CALL LIST.)

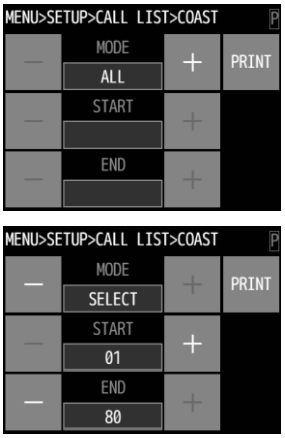
1	NO NAME MMSI AIS blue (print) button	The blue button and the P indicate printing is possible. (*) Start printing operation.
2	01 ABCDEFGHIG 999999999 OFF (list) button	Displays the screen after a list is selected. (01 is the list number)
3	GOTO (GOTO) button	Displays the screen to input list numbers. (Displays the list of numbers after input.)
4	(scroll) buttons ([↑]/[↓]) buttons	Scroll through lists.

*The STATE in the MENU>SETUP>PRN PROP screen must be ON.
Printing is not possible if this is off. It is the normal color pattern and P does not appear.
The following operations are done when you touch the blue [Print] button.

- If the popup shown on the right appears, touch the [OK] button. "PRINTING NOW..." appears during printing. Touch the [CANCEL] button to stop.



- To print everything, select ALL for MODE and touch the [PRINT] button while the print range setting screen is displayed. To print a specific list, select SELECT and set the start number (START) and end number (END) for the list number you want to print, and then touch the [PRINT] button. A popup appears, touch the [OK] button. (On the right is an example of CALL LIST>COAST.)



Note
- Even if you do not touch the blue [Print] button, printing is possible if the [PRINT] button is displayed.
- Printing cannot be done from the controller.
- Refer to Menu tree in 4.1 Operation overview regarding which menus can be printed.

3. INSTALLATION

⚠ CAUTION

Leave installation of this equipment to our service center or agents. Special knowledge on selecting the place where the antenna is to be mounted and setting the ID number (MMSI) assigned to the ship is required in addition to mounting the equipment.

4. OPERATION

This chapter describes basic operations of the equipment, radiotelephone communications, procedures to use DSC to call another station, and other functions.

⚠ CAUTION

Do not carry out operation of touch panel by a sharp object. Otherwise, the screen may be damaged.

If power outage occurs inside of the ship during the operation of this unit, the image may be disturbed or may not be displayed. In this case, reconnect the power supply.

4.1 Overview of operations of the equipment

Operations are basically done by using the buttons on the touchscreen. The following is an overview of their operation.

- When two or more controllers are connected, basically only the main unit or controller that has the access rights can be operated, except for sending a distress alert, changing audio volume, and changing display conditions. (Unless otherwise mentioned, the instructions below are for the controller with the access right.)
- You can obtain the access right at a main unit or controller that does not have access rights by taking the handset off-hook, unless the other main unit or controller is being used (off-hook, PTT ON, or menus are being operated). However, the device with higher priority can always obtain the access right unless the lower priority device is in a PTT ON state.
- The DISTRESS button is always enabled regardless of the access right (it always has the highest priority). In the status display, you can change the transmitting channel by using the numeric keypad that is displayed by touching the channel display or the [Select Channel] button.
- Touch the [FUNC]→[CH MONI] buttons on the status display to open Channel Monitor mode. You can force the squelch to open, until the [CH MONI] button is touched again, so you can monitor the incoming audio (or noise) regardless of the radio wave reception conditions.
- Replacing the handset on-hook returns the channel to CH16 (factory default value). Also, on-hook detection can be disabled by using the handset menu.
- All the functions can be operated by using the [MENU] button on the status display on the touchscreen, as well as the other knobs and buttons. (See the menu tree of the equipment on the next page.)
- In the status display, touching the [FUNC] button displays the buttons with functions that have been registered in advance, so you can easily execute the various registered functions with simple procedures.
- After displaying the main menu by touching the [MENU] button, the items in the main menu are displayed by touching the various buttons.
- Any menu can be assigned to the [FAVORITE] button to quickly open it with a single touch of a button.
- Touching the [←] button in any menu moves the display up one level in the hierarchy (or to the status display).
- Touching the [MAIN] button in any menu moves the display to the status display.
- If left without operating after opening a menu screen for a while (the time length is variable), the screen automatically returns to the status display.
- Dialog boxes (pop-up screens) are opened when necessary and operations can be done in the dialog box.
- Items in the menu tree on the following page indicated by "OK" in the "Printable" column can be printed from a printer connected to the main unit by touching the guidance button (blue) in any menu screen. (*Printing cannot be done from a controller.)

Menu tree

Menu	Hierarchical Menu 1	Hierarchical Menu 2	Printable	Note
CALL				DSC non-distress call
RELAY				DSC drobose call
DIST-E				Editing a distress msg
DSC LOGS	RX DIST		OK	Received distress list
	RX OTHERS		OK	Received others list
	TX CALLS		OK	Transmitted calls list
AIS INFO	SHIPS LIST		OK	Other ships list
	PROX CHECK			Proximity check
VOICE FUNC	PLAY-BACK			Playback
	PUBLIC ADDR			Public address
	INTCOM			Intercom
CH OPE	SCAN	ALL CH		channel operation
		MEMORY CH		
		SELECT CH		
	DUAL WATCH			
	TRIPLE WATCH			
	MEMORY CH	CH LIST	OK	
		CH EDIT		
	PRIV CH		OK	Private channel
	WX CH		OK	Weather channel
	REGION	ITU		
		USA		
		CAN		
		IWW		
	CH SQL SET			
MAINT	ALARM INFO	ALARM HIST	OK	Maintenance
	SYSTEM INFO		OK	
	S/W VER		OK	Software version
	DSC AF CHECK			
SELF DIAG	TRX		OK	TRX diagnosis
	DISP		OK	Display diagnosis
	DSC LOOP		OK	
	TRX LOG		OK	
	DISP LOG		OK	
TEST CALL				
SETUP	DATE&TIME			
	POS/TIME			
	DISP SET	LCD ADJ		LCD adjustment
		SOUND		
		KEY ASSIGN		
		UNIT NAME		
		MENU SHTDN		Menu shutdown
		HANDSET		
		CH AREA		
		S METER		
		INTERLOCK	OK	Only for the controller.
	BT SET	BT FUNC		Bluetooth function
		BT PAIR	OK	Bluetooth pairing
	CALL LIST	COAST	OK	Coast station list
		SHIP	OK	Ship station list
		GROUP	OK	Calling group list
		PSTN	OK	PSTN number list
	DSC OPE	AUTO ACK	OK	Automatic ACK
		RX ALARM	OK	Safety/Routine alarm
		MDCL USE	OK	Medical use
		NEUT USE	OK	Neutral use
		EXP MMSI	OK	Expanded MMSI
		GROUP ID	OK	
		INACTV T/O	OK	Inactivity timeout
	AIS FUNC			
	PRN PROP		OK	Printer Property
CODE INPUT				

(*Printing cannot be done from a controller.)

4.2 Basic communication procedure

The following describes basic radio communication procedures.

4.2.1 Turning ON the power

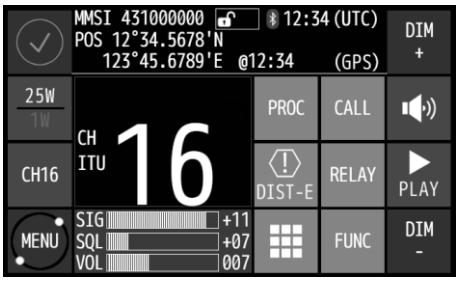
⚠ CAUTION

Do NOT turn off the power of the equipment when at sea because the SOLAS Convention requires keeping CH16 watch at all times.

■ Procedure ■

1. Press the [PWR] button for at least 1 second.

   An operational check is done to the main unit and controllers. (The screen at right shows the case of the main unit.) If it ends successfully, the status display appears and the channel that appears on screen is receiving.



Note

- If detected errors during the memory check, displays the message below. Please inform JRC or our agent of the error contents.
- Pressing the [PWR] button for 5 to 10 seconds or more will completely turn off the power. When you press for 2 seconds or longer, the pop-up "THE SYSTEM WILL BE SHUT DOWN WITHIN 8 SECONDS." will be displayed.

Message	Contents
DETECTED MEMORY ERROR! SO CLEARED THE AREA OF VHF RADIOTELEPHONE MEMORY.	Detected memory error in main unit.
DETECTED MEMORY ERROR! SO CLEARED THE AREA OF CONTROLLER MEMORY.	Detected a memory error when starting controller.
DETECTED THIS CONTROLLER'S ADDRESS SETTING ERROR! SO REQUIRED INITIAL SET AFTER RESTARTING AS THE MAINTENANCE MODE	Detected this controller's address error when starting the controller.
DETECTED JHS-800S LOST! SO REQUIRED INITIAL SET AFTER RESTARTING AS THE MAINTENANCE MODE.	Detected a transmission error between main unit and controller when starting.
DETECTED MMSI LOST! SO CONCERNED FUNCTIONS (DSC/ATIS) NO LONGER AVAILABLE NOW.	Unregistered MMSI yet, or lost the MMSI. So required to install MMSI for DSC/ATIS.
DETECTED THE VHF RADIOTELEPHONE'S PCB COMBINATION ERROR! SO REQUIRED TO REPLACE THAT INCORRECT PCB WITH THE CORRECT ONE.	Detected improper PCB assembly in main unit.

4.2.2 Turning OFF the power

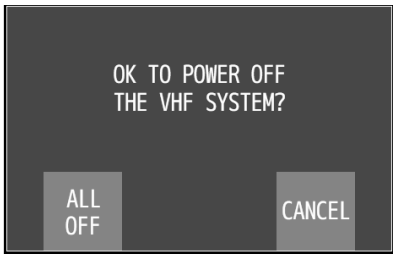
■ Procedure ■

1. Press the [PWR] button for at least 1 second.

In this case, the process varies, as shown below, according to the main unit and the status of the connected controllers.

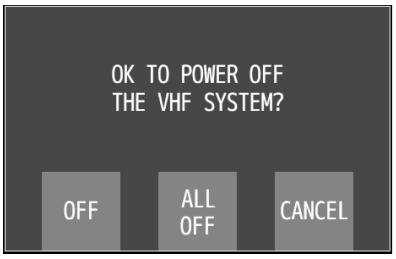
(1) In case of the main unit, the popup screen on the right appears. Select one of the following.

- [ALLOFF]: Turns off the power to the main unit and all controllers.
- [CANCEL]: Returns to the previous screen.



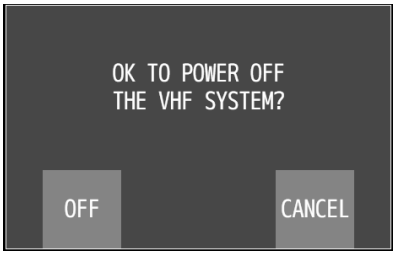
(2) In case of the controller being have the access rights, the popup screen on the right appears. Select one of the following.

- [OFF]: Turns off the power to the controller.
- [ALL OFF]: Turns off the power to the main unit and all controllers.
- [CANCEL]: Returns to the previous screen.



(3) In case of the controller not being have the access rights, the popup screen on the right appears. Select one of the following.

- [OFF]: Turns off the power to the controller.
- [CANCEL]: Returns to the previous screen.



Note

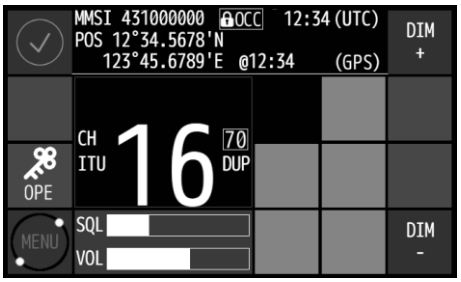
- If multiple controllers are operating and you turn off the main unit or a controller while it has access rights, the access rights move to the main unit or a controller in order of priority.
- Pressing the [PWR] button for 5 to 10 seconds or more will completely turn off the power. When you press for 2 seconds or longer, the pop-up screen " THE SYSTEM WILL BE SHUT DOWN WITHIN 8 SECONDS." will be displayed.

4.2.3 Communicating with the radiotelephone

The VHF radiotelephone is operated by means of a handset.

■ Procedure ■

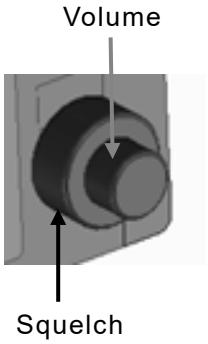
1. If you do not have the access rights, touch the OPE button on the status display.



You acquire the access right and the OCC display disappears from the screen and the disabled buttons become enabled, unless the main unit or the controller that has the access right is busy. Or, you can acquire the access right by just lifting the handset from the cradle.

Note When the hook-switch setting is invalid, the access right cannot be acquired by lifting the handset from the cradle.

2. Adjust the volume on the loudspeaker by turning the volume control.



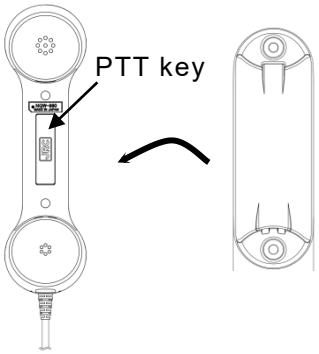
When receiving no signal, make a noise as a guide by turning the squelch control counterclockwise until opened.

3. Turn the squelch control to an appropriate position.

Normally, the squelch control would be adjusted to where rotated the squelch control clockwise one additional tick from the squelch closing position.

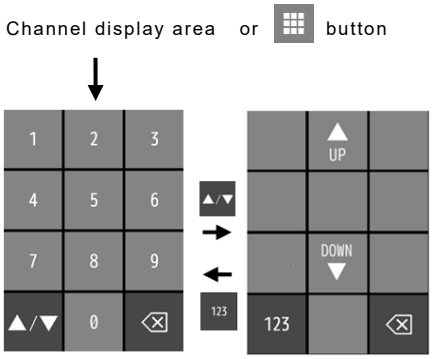
4. Lift the handset from the cradle.

5. Press the PTT key to talk.



- The TX mark is appeared on the screen to show the equipment is transmitting. Releasing the PTT key returns to the receiving condition.

6. If necessary, change the channel using the numeric keypad or UP/DOWN button.



To open the numeric keypad, touch the channel display area or the (channel selection) button in the status display. And to open the UP/DOWN button, touch the ▲/▼ button.The PTT button must be released to change channels. When inputting a channel on the numeric keypad, input [1] and then [8] for channel 18.

7. When finished the communication, return the handset to the cradle.

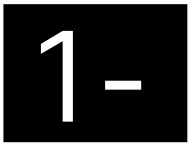
Note Replacing the handset back on-hook returns the channel to CH16. However, if the hook-switch setting is invalid, the channel is not returned by replacing the handset to the cradle.

■ Changing the channel ■

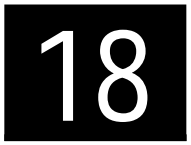
(1) Setting a 2-digits channel (Incase of the CH18)

1. In the status display or operations screen, touch the channel display area or the button to open the numeric keypad.

2. Touch the [1] button.
   "1" is appeared. Then if left for more than 1 second, the hyphen is appeared and starts flashing as shown at right.



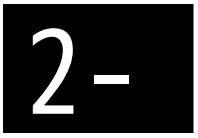
3. Touch the [8] button.
   Setting of the CH18 is finished.



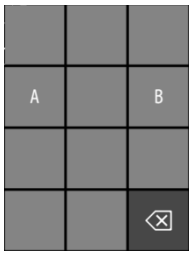
(2) Setting a 2-digits channel with a letter A/B (Incase of the USA CH20A)

1. Set the region category to USA. Then, in the status display or operations screen, touch the channel display area or the button to open the numeric keypad.

2. Touch the [2] button.
   "2" is appeared. Then if left for more than 2 seconds, the hyphen is appeared and starts flashing as shown at right.



3. Touch the [0] button.
   CH20 is set, and the [A] and [B] buttons appear.



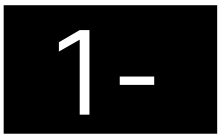
4. Touch the [A] button.
   Letter A is appeared and setting of the CH20A is finished.

(3) Setting a 4-digits channel (Incase of the CH1020)

1. In the status display or operations screen, touch the channel display area or the button to open the numeric keypad.

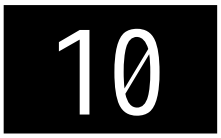
2. Touch the [1] button.

   "1" is appeared. Then if left for more than 1 second, the hyphen is appeared and starts flashing as shown at right.



3. Touch the [0] button.

   CH10 is set, first.



4. Touch the [2] button within one second.

   The 4-digits display form at right is appeared. Then if left for more than 1 second, the hyphen is appeared and starts flashing as shown at right.

5. Touch the [0] button.

   Setting of the CH1020 is finished.

Note When the hyphen is flashing, if left without inputting a figure for 2 seconds, the channel returns to the previous value. Additionally in the above example, if the 3 digits are input and the hyphen is flashing at the ones place digit for 2 seconds, then the channel returns to the CH10 which is temporarily set in this procedure.

■ Making a radiotelephone call ■

1. Select CH16 or other agreed channel.
2. Lift the handset from the cradle.
3. Press the PTT key, and make a call as described below.
   - Say the calling station name ... Repeat 3 times.
   - "this is"
   - Say own ship name ... Repeat 3 times.
   - "over"
4. Release the PTT key to listen.
5. When answered and agree on a working channel, change to that channel.
6. After checking that no station uses the working channel, begin conversation.

Note
- When transmitting from own station, always press the PTT key while talking.
- On a simplex channel, always say "over" just before releasing the PTT key.
- Always say "out" when terminating communications.

■ Receiving a call on CH16 ■

1. Lift the handset from the cradle.
2. Press the PTT key, and respond to the call as described below.
   - Say the caller station name.
   - "this is"
   - Say own ship name.
3. Propose a channel other than 16 as described below.
   - "channel"
   - Working channel number
4. Allow the caller station to transmit.
   - "over"
5. Release the PTT key, wait a moment, and then switch to the proposed working channel.
6. After checking that no station uses the working channel, begin conversation.

Note
- When transmitting from own station, always press the PTT key while talking.
- On a simplex channel, always say "over" just before releasing the PTT key.
- Always say "out" when terminating communications.

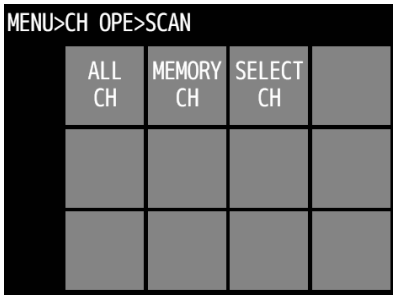
4.2.4 Receiving with scanning

Scanning function enables to watch multiple channels (additional channels) with the priority channel (CH16). If found receiving signal on the additional channels, the dwell time on that channel will be longer, but continued to watch the CH16 alternatively. The scan mode can be selected from the following modes.

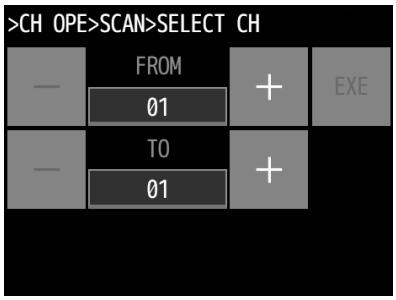
- All CH scan Mode: Scans all channels in the current channel mode.
- Memory CH scan Mode: Scans all memory channels.
- Select CH scan Mode: Scans the specified range of channels.

■ Procedure ■

1. In the main menu, touch the [CH OPE] → [SCAN] buttons.

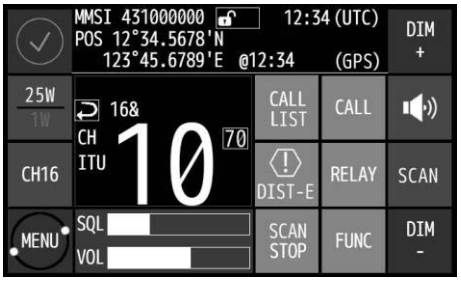


2. Touch the menu button of the scan mode you want to select.



- If you select the [ALL CH] button (All CH scan) or the [MEMORY CH] button (Memory CH scan), then scanning starts immediately.
- If you select the [SELECT CH] button (Select CH scan), then the screen on the right appears and you can use the following operation to change the channel range.

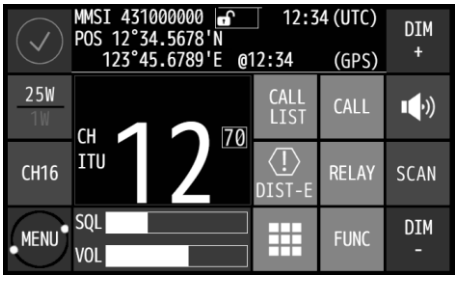
  1) You can change the start channel (FROM:) and the stop channel (TO:) by using the [+]/[-] buttons or the [Edit] button.
  2) After changing the settings, press the [EXE] button, and then scanning starts as shown at right.



Note
- Disabled to scan when the channel region is Inland Waterways (IWW).
- CH70 is skipped, even if contained in the scanning range.

3. Touch the [SCAN STOP] button to stop scanning.

- After terminated, the radiotelephone is set on the last additional channel. (The example at right shows when stopped on CH12.)
- Scanning is also terminated when off-hook or PTT ON is detected.



Note
- While scanning, the radiotelephone scans CH16 and the additional channels alternatively in a cycle of 0.14/0.86 seconds.
- If the squelch is opened on the CH16, paused scanning and continues to watch

on the CH16. If squelch is closed again, the scanning will resume 2 seconds later.

- If the squelch is opened on an additional channel, remains on that channel and CH16 alternatively (in a cycle of 0.14/1.86 seconds). If squelch is then continuously closed (until the end of the scan cycle), the scanning will resume. Furthermore, added to the additional channel, if the squelch is also opened on the CH16, paused scanning and continues to watch on the CH16 as described above.

4.2.5 Receiving with dual watch

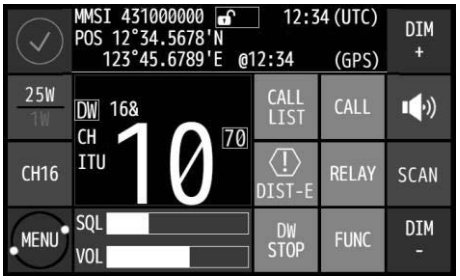
Dual watch function enables to watch an additional channel with the priority channel (CH16). If found receiving signal on the additional channel, the dwell time on that channel will be longer, but continued to watch the CH16 alternatively.

■ Procedure ■

1. On the main menu, touch the [CH OPE] → [DUAL WATCH] buttons and use the [+]/[-] buttons to select the channels for dual watch.

2. Touch the [EXE] button.

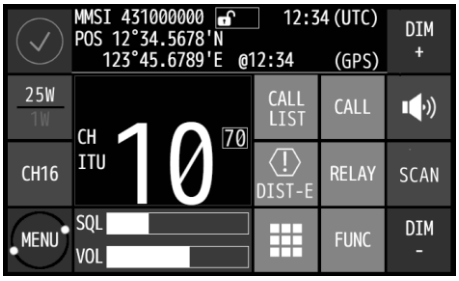
   The dual watch starts immediately.
   The example at right shows the case of CH10 selected.



   Note — Disabled the dual watch either when the channel region is Inland waterways (IWW) or when CH70 has been selected.

3. To terminate the dual watch, press the [DW STOP] button.

   - After terminated, the radiotelephone is set on the additional channel. (The example at right shows when stopped on CH12.)
   - The dual watch is also terminated when off-hook or PTT ON is detected or a channel is set in the DSC transmission menu.



Note

- During the dual watch, the radiotelephone watches CH16 and the additional channel alternatively in a cycle of 0.14/0.86 seconds.
- If the squelch is opened on the CH16, pauses the dual watch and continues to watch on the CH16. If squelch is closed again, the dual watch will resume 2 seconds later.
- If the squelch is opened on the additional channel, the dwell time on that channel will be longer, but continues to watch the CH16 alternatively (in a cycle of 0.14/1.86 seconds). If squelch is then continuously closed (until the end of the dwell time), the dual watch will resume. Furthermore, added to the additional channel, if the squelch is also opened on the CH16, pauses the dual watch and continues to watch on the CH16 as described above.

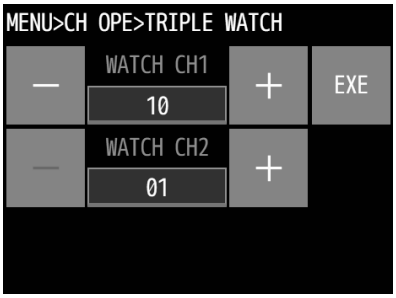
4.2.6 Receiving on triple watch

With triple watch, channel 16 and two other channels are monitored.

■ Procedure ■

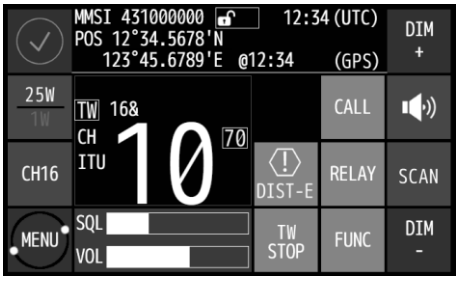
1. On the main menu, touch the [CH OPE] → [TRIPLE WATCH] buttons and use the [+]/[-] buttons or the [Edit] button to select two channels for triple watch.

   Channel 10 and 30 are selected in the example on the right.



2. In the main menu, touch the [CH OPE] → [DUAL WATCH] buttons.

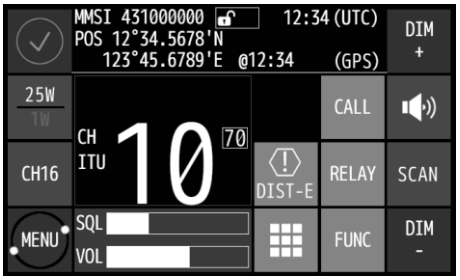
   The triple watch starts immediately.



   Note
   - You cannot do dual watch if the region mode is an Inland Waterway (IWW) channel.
   - Dual watch cannot be done on channel 70.

3. To terminate the triple watch, touch the [TW STOP] button.

   - The channels for triple watch are stopped and the transceiver starts receiving. (The example at right shows when triple watch is stopped on channel 10.)
   - The triple watch is also terminated when off-hook or PTT ON is detected or a channel is set in the DSC transmission menu.



Note
- During the triple watch, the radiotelephone watches channel 16 and two other channels and the channels cycle in order with a dwell time of 0.14/0.43/0.43 seconds.
- If the squelch is opened on channel 16, the triple watch pauses and the watch continues on channel 16. If squelch is closed again, the dual watch resumes 2 seconds later.
- If a signal is detected and the squelch is opened on one of the other two channels in the triple watch, the dwell time changes to a cycle of 0.14/1.86 seconds and the watch continues (other channels are not scanned and watched). If squelch then remains continuously closed (until the end of the triple watch cycle time), the triple watch resumes as normal. Furthermore, if in this state a signal is detected on channel 16, then channel 16 is watched continuously as described above.

4.2.7 Using memory channels

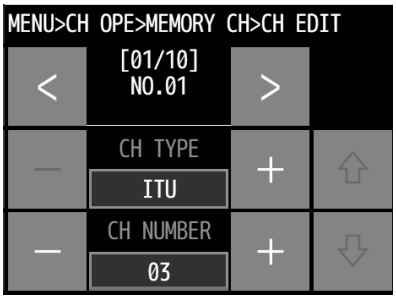
Memory channels are the original channel list. The desired channels (e.g. frequently using channel) can be registered and used for easy access.

(1) Registering memory channels

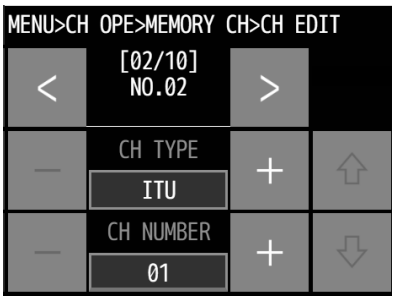
■ Procedure ■

1. In the main menu, touch the [CH OPE] → [MEMORY CH] → [CH EDIT] buttons.

   An example is shown on the right.

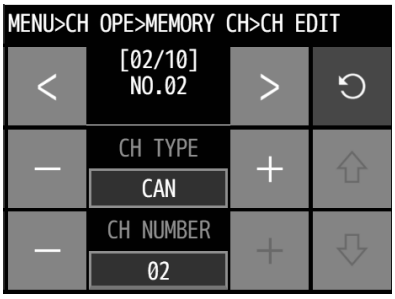


2. Display the page you want to register with the [<]/[>] buttons.



3. Use the [+]/[-] buttons to select a channel category and select a channel number with either the [+]/[-] buttons or the [Edit] button.

   First, ITU is displayed. Touching the [+] button at this point changes the setting to ITU → USA → CAN → IWW → PRIVATE → WEATHER → NONE.



   - ITU/USA/CAN/IWW: Region channel
   - PRIVATE 0/PRIVATE 1/PRIVATE 2: Private channels (with a hundred digit)
   - WEATHER: Weather channel

   (NONE: No setting)

   If you want to register other channels, use the [<]/[>] buttons to display them,then use the same operation to select their channel category and the channel number.

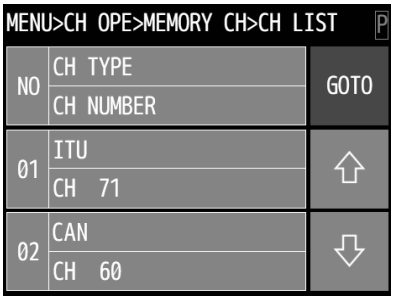
4. Finally, touch the [✓] button to register.

(2) Communicating on a memory channel

Memory channels is available e.g. when setting a working channel for subsequent communication after initial contact on CH16.

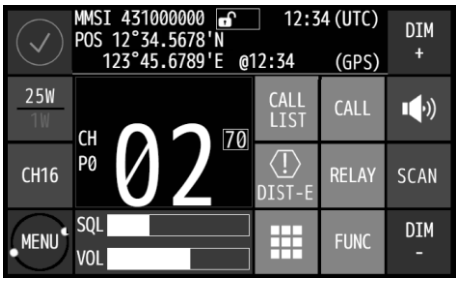
■ Procedure ■

1. In the main menu, touch the [CH OPE] → [MEMORY CH] → [CH LIST] buttons.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the memory channel number, then touch the [LIST] button.

   If the memory channel number 01 on the screen above is selected, the CH P002 is set and the communicating procedure is started in active.

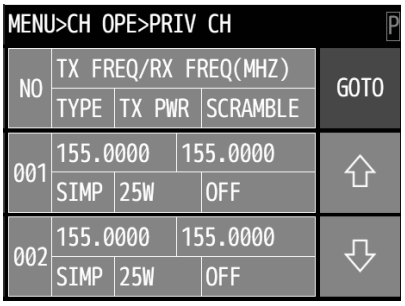


4.2.8 Communicating on a private channel

Private channels for assigned frequencies of fishing ship or other specially assigned frequencies are registered at the installation of equipment. Up to 200 channels are available for radiotelephone communications. (If required to add channels after installation, please contact JRC or our agent.)

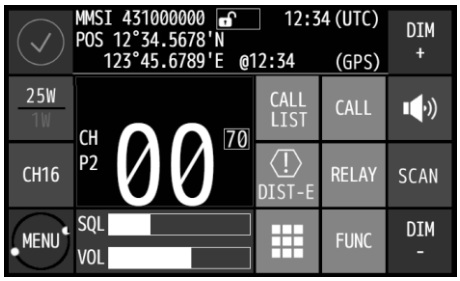
■ Procedure ■

1. In the main menu, touch the [CH OPE] → [PRIV CH] buttons.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the channel you want to set, then touch the [LIST] button.

   If you select PRIVATE CH 200, the status display appears as shown at right.

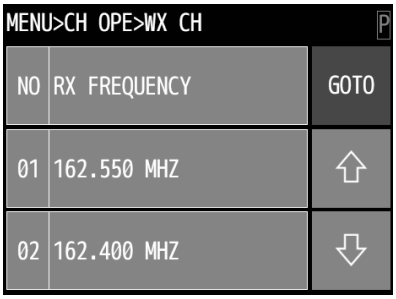


4.2.9 Receiving a weather channel

Weather channels are available to receive weather information on the North American coast.

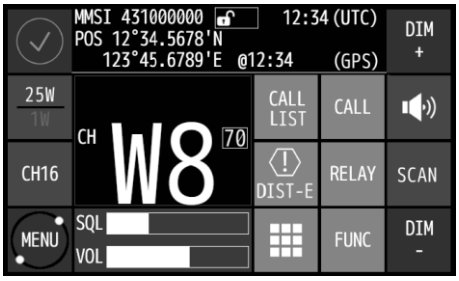
■ Procedure ■

1. In the main menu, touch the [CH OPE] → [WX CH] buttons.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the channel you want to set, then touch the [LIST] button.

   If you select channel 08, the status display appears as shown at right.



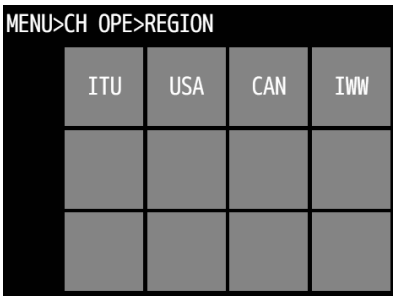
Note Disabled to transmit on weather channels.

4.2.10 Changing the channel region

This menu sets the channel region to ITU, USA, Canada (CAN), or Inland Waterway (IWW).

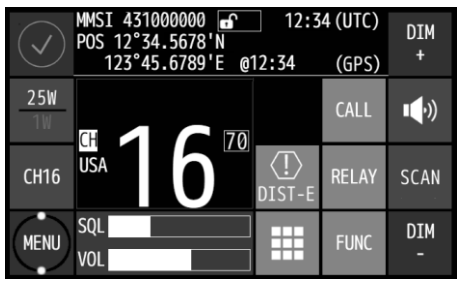
■ Procedure ■

1. In the main menu, touch the [CH OPE] → [REGION] buttons.



2. Touch the menu button of the region mode you want to select.

   When selected the USA channel, the screen becomes as shown at right.



Note When set to the Inland Waterway (IWW), changed a few functions as follows.

- Enabled the ATIS function automatically and sends the ATIS code over the voice channel when releasing the PTT key. Also, if pressed the PTT key continuously, sends the ATIS code every five minutes automatically.
- The scan, dual watch, and triple watch functions are prohibited.

- When operating the DSC menus, a popup screen is displayed to notice that the DSC usage is not allowed on Inland Waterways.

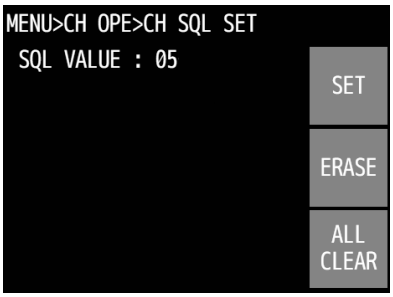
4.2.11 Squelch settings of each channel (preset squelch)

The adjusted squelch value can be stored with respect to each channel as a preset squelch. The handling of the preset squelch is as follows.

- If stored the squelch value, the preset squelch is always set just after the channel selection.
- While the preset squelch has been set, "PSQL" is indicated on the status display.
- If turned the SQL control after setting the preset channel, the preset value is canceled immediately and the SQL control is available.
- The preset squelch value can be cleared with respect to each channel or each channel region.

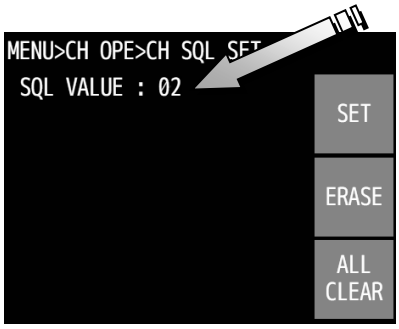
■ Procedure ■

1. After setting a channel to preset the adjustment value for the squelch, in the main menu, touch the [CH OPE] → [CH OP] → [CH SQL SET] buttons.



2. Turn the SQL control to the appropriate position.

   The SQL VALUE as shown at right is changed according to the position of the knob.



3. Touch the [SET] button to complete the preset for the squelch.

Note

- To delete a preset squelch, set that channel and then touch the [ERASE] button in the CH SQL SET menu above.
- To clear the preset squelch values for all the channels in a set region, touch the [ALL CLEAR] button in the CH SQL SET menu above.

4.3 Basic DSC operations

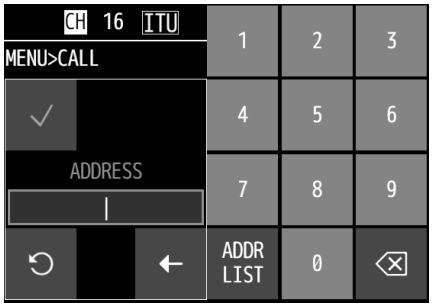
When calling stations, the DSC is also available for a routine/ safety/ urgency or a distress call in addition to the calling by radiotelephone described above. This section describes the procedures for basic DSC routine calls and for the AIS-linked DSC calls.

4.3.1 Routine calls to an individual station

A DSC routine call to the station to be called is initiated as follows.

■ Procedure ■

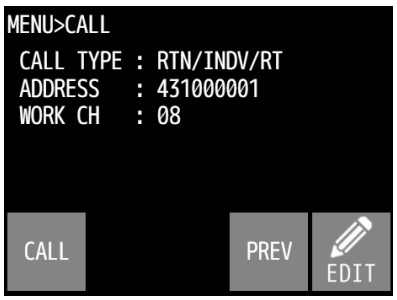
1. Touch the [CALL] button.



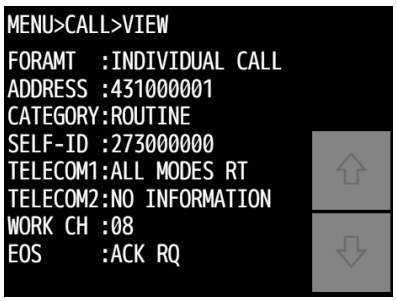
   - It can also be displayed by touching [MENU]→[CALL]→[EDIT]→[ADDR].
   - Press the [ADDR LIST] button to display the alphabetically sorted list of stations that have been registered. Use the [↑]/[↓] buttons or the [SEARCH] button to display the channel you want to call, then touch the [LIST] button to select it.
   - Use the numeric keypad to manually input the ADDRESS (MMSI) you want and then touch the [✓] button to confirm it. If you input all the digits it is automatically confirmed.

Note Register channels to the station list in the CALL LIST menu (MENU > SETUP).

2. After an ADDRESS is confirmed, touch the [CALL] button to make a call.

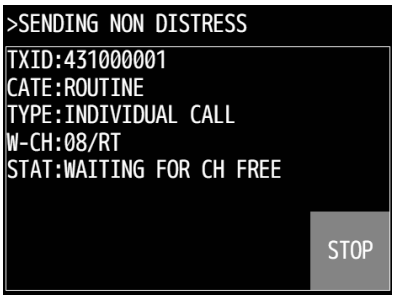


   - If inputting the ship's address, the Work CH is selected automatically. Furthermore, in the case of the coast station call, the message does not include the working channel because the working channel is decided by the coast station.
   - To check the details of the message, touch the [PREV] button to open a screen as shown on the right (below).



3. The operating display is appeared and initiates the DSC call

After checking the channel free condition, sends the message and waits for the acknowledgement.

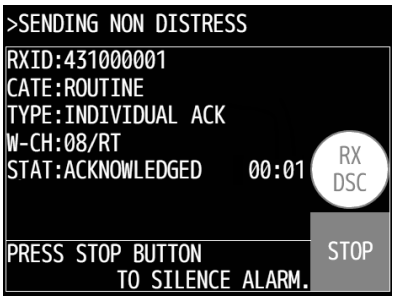


Note The following operations are possible while you wait for acknowledgement.

- RTRY: Resends the message.
- INF: Indicates the message contents.
- HLD: Makes the event on hold.
- END: Terminates the event.

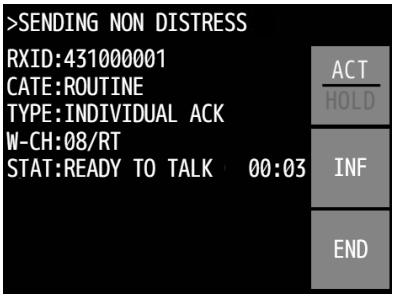
4. When acknowledgement is received, the received mark flashes and the alarm sounds.

- Touch the [STOP] button to stop the alarm.
- The working channel is set automatically.



5. After setting the working channel, start communications using the handset.

- The screen as shown at right is displayed.
- When completed the communications, return the handset to the cradle.



Note If the station is unable to comply with the call, own station (caller) may receive one of the following responses may be received. In these cases, if possible according to the message, wait and retry the calling again later. (* is for the coast station only.)

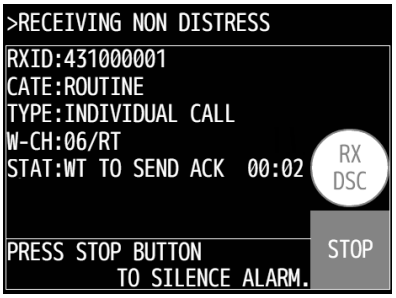
Message	Content
NO REASON	No reason.
CONGESTION*	The marine exchange center is congested.
BUSY	Busy.
QUEUE	The call has been queued.
BARRED	The station is closed.
NO OPER	Existing no operator.
TEMP NO OPER	The operator is temporarily away.
EQP DISABLED	The equipment has been disabled.
UNABLE CH	The proposed channel cannot be used.
UNABLE MODE	The proposed mode cannot be used.

4.3.2 Receiving routine individual calls

When receiving an individual DSC call from a coast or ship station, perform the following procedures as appropriate according to the message.

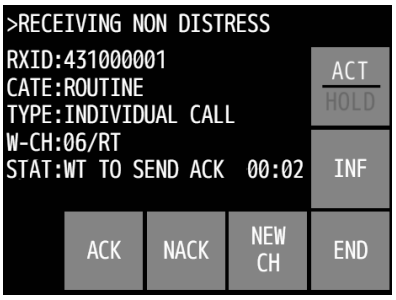
■ Procedure ■

1. The receiving screen is displayed, the received mark flashes, and the alarm grows louder gradually.



   This example message contains the following information.
   - Message type: Routine individual call
   - Caller's MMSI: 431000001
   - Object: All modes RT on CH06

2. Press the [STOP] button to stop the alarm and display the screen at right.

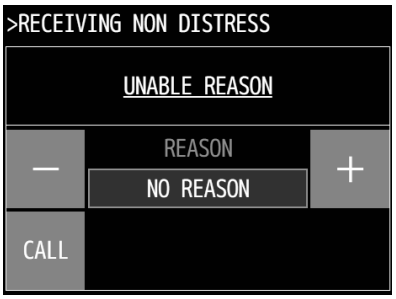


   The operation menu buttons are displayed.

3. Select a process with the operation menu buttons.

   The options are provided as below.

   ACK: Transmits acknowledgement
   NACK: Transmits non-acknowledgement
   Note) Select the reason for not acknowledging from the UNABLE REASON screen at right by using the [+]/[-] buttons.
   (NO REASON, BUSY, BARRED, NO OPER, TEMP NO OPER, EQP DISABLED, UNABLE CH, UNABLE MODE, QUEUE)



   NEW CH: Transmits an acknowledgement over a specified transmission frequency
   END: Terminates the transmission
   INF: Displays the received message
   ACT/HOLD: Holds or releases hold on the transmission that is in progress

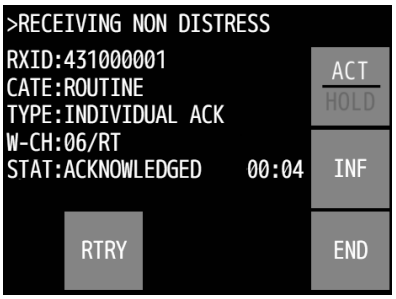
:

4. To acknowledge you "Accept" a call, touch the [ACK] button.

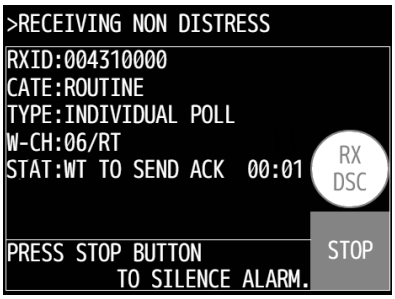
   - Lifting the handset off hook also transmits an acknowledgement in the same way as the [ACK] button.
   - The equipment waits for the channel free condition as shown at right. And after that, the acknowledgement is sent immediately.

5. After sending an acknowledgement, the working channel is set to communicate.

   Start communicating using the handset.



Note When a polling call is received, it appears as in the diagram below, the receiving mark flashes, and the alarm grows louder gradually. In this case, after silencing the alarm, select ACK to acknowledge it.



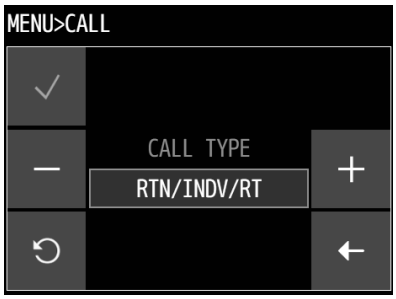
Furthermore, if there is no transmission in progress, the acknowledgement for this call is automatically transmitted if auto acknowledgement for this POLLING call is set to ON in the AUTO ACK menu (MENU>SETUP>DSC OPE).

4.3.3 Routine group calls

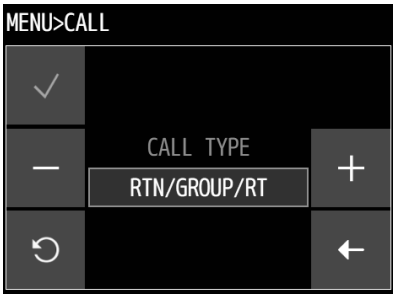
For radiotelephone broadcasting, a DSC routine call to a group of stations is available.

■ Procedure ■

1. In the main menu, touch the [CALL] → [EDIT] → [CALL TYPE] buttons.



2. Use the [+]/[-] buttons to set the CALL TYPE as shown at right to RTN/GROUP/RT, and then touch the [✓] button.

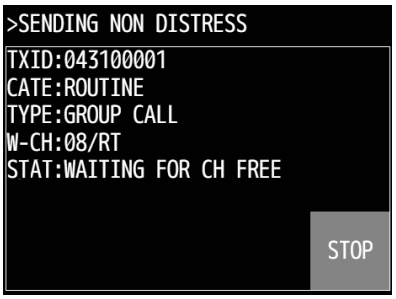


3. Touch the [EDIT]→[ADDR] buttons and input the group ID that you want to call, and then touch the [✓] button.

   The working channel is set automatically.

4. Touch the [CALL] button and transmit a group call.

   After checking the channel free condition, sends the message.



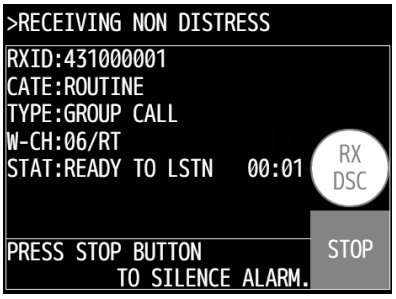
5. After sending the message, the working channel is set and the DSC calling procedure is finished.

   Start broadcasting using the handset.

4.3.4 Receiving routine group calls

■ Procedure ■

The receiving screen at right is displayed, and the receiving mark flashes and the alarm grows louder gradually.



If no transmission was just done, the received call starts immediately in progress and the work channel is set automatically. Additionally, this receiving alarm stops automatically in 10 seconds, but you can stop it manually by touching the [STOP] button.

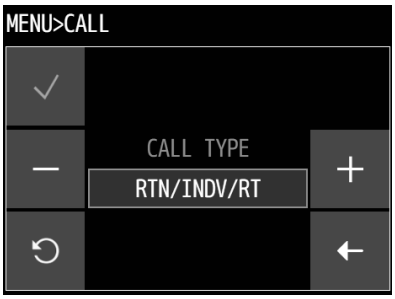
4.3.5 Communicating with a PSTN subscriber

The semi/auto mode is available to connect with a public telephone network (PSTN) via a coast station.

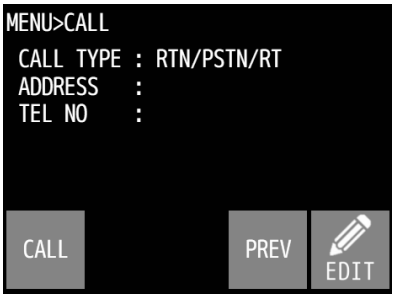
(1) Make a call to a PSTN subscriber

■ Procedure ■

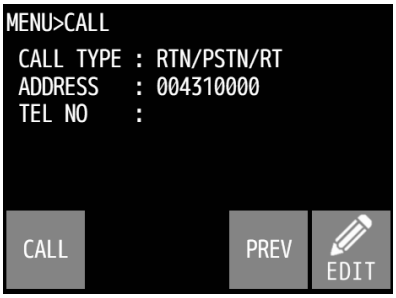
1. In the main menu, touch the [CALL] → [EDIT] → [CALL TYPE] buttons.



2. Use the [+]/[-] buttons to set RTN/PSTN/RT, and then touch the [✓] button.



3. Touch the [EDIT] → [ADDR] buttons, and then input the ID of the coast station you want to call, the same way as described above for doing a routine call.

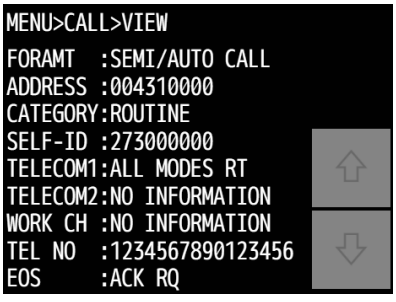


4. Touch the [EDIT]→[TEL NO] buttons and input the telephone number that you want to call, and then touch the [✓] button.

Press the [ADDR LIST] button to display the alphabetically sorted list of telephone numbers that have been registered. Use the [↑]/[↓] buttons or the [GOTO] button to display the number you want to call, then touch the [LIST] button to select it.

Note Register telephone numbers to the station list in the CALL LIST menu (MENU > SETUP).

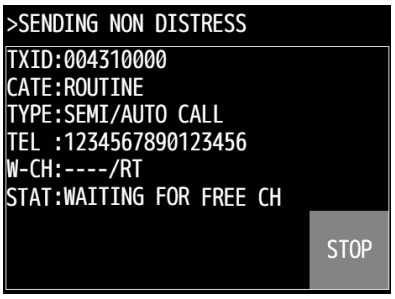
To check the details of the message, touch the [PREV] button to open a screen as shown on the right.



5. Touch the [CALL] button to transmit the call.

After checking the channel free condition, sends the message. After sending the call, waits for the acknowledgement for 5 sec.

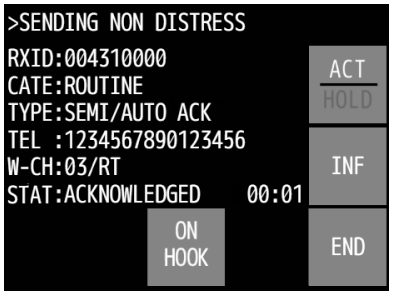
Note If received no response within 5sec, sends the call again. If there is still no response, this call is ceased.



6. After received the acknowledgement, the specified working channel is set.

After the channel changing, a start of call is sent.

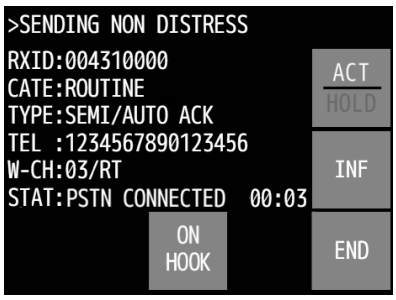
Note If the channel engaged signal is lost, this call is terminated.



7. The PSTN connection is completed.

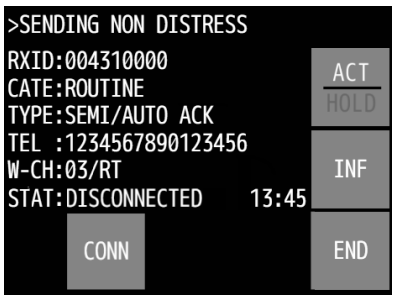
Lift the handset from the cradle and wait for the recipient answering the phone (the PSTN dial tone and ring tone from the handset is heard at this time). After answered the phone, the phone call charge is started.

Note If not answered within 1 minute, this call is terminated. (It may be similar in the case of bad radio link condition during communication.)



8. To finish the phone call, return the handset to the cradle.

Additionally, the duration is received from the coast station and is displayed as the DUR. The example at right shows 13 minutes and 45 seconds.

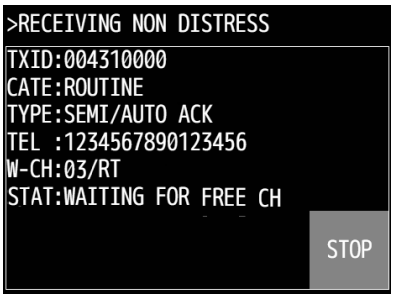


Note
- According to the coast station, the “unable to comply” acknowledgement mentioned above may be received at step 5.
- If a message saying "REASON: QUEUE" is displayed when you receive an unable to comply acknowledgement, you can continue the operation from step 5 by selecting WAIT when you receive a ring-back call. (However, if receiving no call within 15 minutes after receiving "Queue", the ring back mode is canceled. Also, if you press the [CH16] key, the ring-back mode is cancelled.)

(2) Receiving a call from a PSTN subscriber

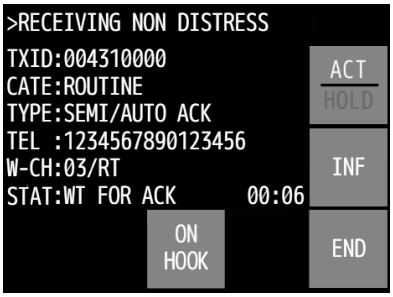
■ Procedure ■

1. When a PSTN call is received from a coast station, if you did not call immediately beforehand and you are not currently transmitting a call, then a screen like the one to the right appears as in progress and a response is sent immediately.



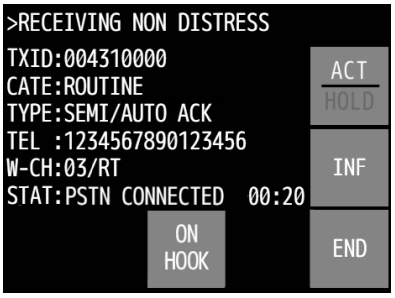
2. After sending the acknowledgement, the screen at right is displayed.

   - The alarm grows louder gradually.
   - The message at right shows the following information.
     - Coast station ID: 004310000
     - Categori: General calls for routine works
     - Type: Radiotelephone
     - Work Channel: CH03
     - Caller TEL No: 1234567890123456



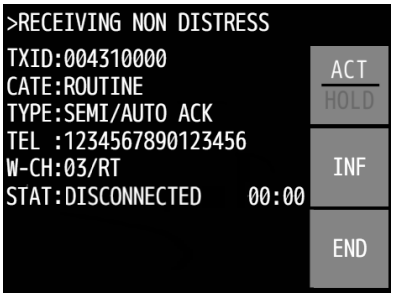
3. If able to comply, lift the handset from the cradle to send the start of call message to start the PSTN communication.

   - If not answered within 1 minute, the PSTN call is cancelled automatically.
   - If interrupted the receiving signal for 5 seconds during communication, the PSTN call is terminated.



4. When finished the phone call, return the handset to the cradle.

   Then an end of call is received from the coast station and the PSTN call is disconnected. However, the duration of the call will not be displayed for free of charge.



4.3.6 AIS-linked DSC calls

The AIS information (nearby ships call signs, names and identification numbers) is displayed as "Other ships list", and are available to call a listed ship via the DSC directly.

NOTE) To use this function, set the import condition to ON in [MENU]→[SETUP]→[AIS FUNC].

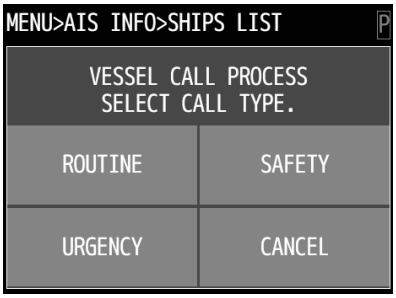
■ Procedure ■

1. In the main menu, touch the [AIS INFO] → [SHIPS LIST] buttons.

- The screen shown at right is displayed.
- The bearings (BRG) are based on the North-up.
- If Proximity check ([MENU]→[AIS INFO]→[PROX CHECK]) is ON, the list number of the targeted ship is blue..
- If there is no AIS information for other ships, "NO DATA" is displayed.

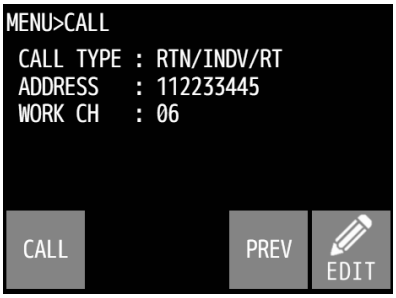
2. Use the [↑]/[↓] buttons or the [GOTO] button to display the ship to call with the DSC, then touch the [LIST] button.

The screen for selecting the category of the DSC call appears.



3. Select the category of DSC call from the routine, safety, or urgency buttons.

The screen at right is displayed. Touch the [CALL] button to call.



Note The rest of the procedure is the same with “4.3.1 Routine calls to an individual station” described above. And also, it is similar in the case of the SAFETY or URGENCY category.

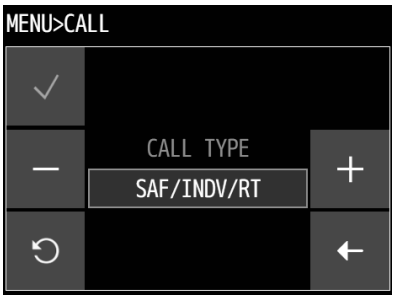
4.4 Emergency calls (DSC safety/ urgency/ distress calls)

In emergency, the DSC is available for safety/urgency/distress calls. For safety and urgency calls, either individual or all ships is selectable for the type of call. Also, there is a way to send distress alerts after selecting, or not selecting, the type of distress on the menu. In both cases, the dedicated DISTRESS button is used to send the distress alerts.

4.4.1 Safety or urgency calls to an individual station

■ Procedure ■

Individual safety and urgency calls are the same as a routine call as described above, except for touching [CALL]→[EDIT]→[CALL TYPE] in the main menu and then selecting SAF/INDV/RT or URG/INDV/RT.



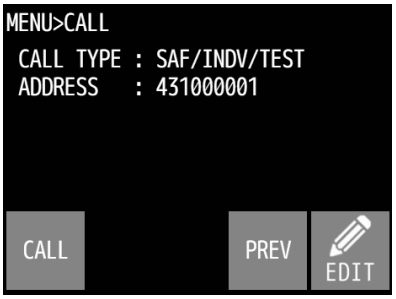
Note Both calls of the safety test and the safety position request are described later.

4.4.1.1 Special safety individual calls (test calls and position request calls)

(1) Safety test calls

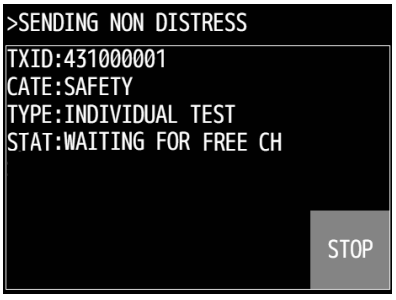
■ Procedure ■

1. Select SAF/INDV/TEST in CALL TYPE and input an address.



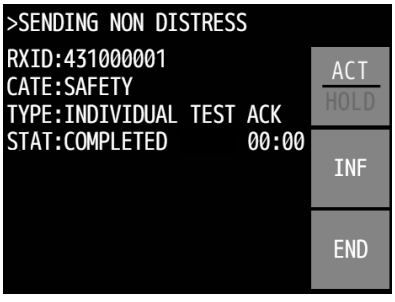
Note The [TEST CALL] button on the main menu is a shortcut menu for test calls.

2. Touch the [CALL] button to transmit the test call.



The screen at right is displayed to check the channel free, and then the safety test call is sent.

3. When acknowledgement is received, the receiving mark flashes and the alarm sounds. After silencing it with the [STOP] button, a received screen as shown at right appears.

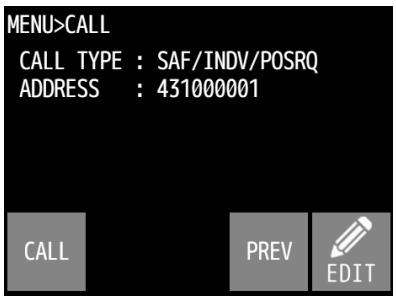


The safety test call process is now complete. However note that even though the call is sent normally, the acknowledgement may not be received from the called station for some reason.

(2) Safety position request calls

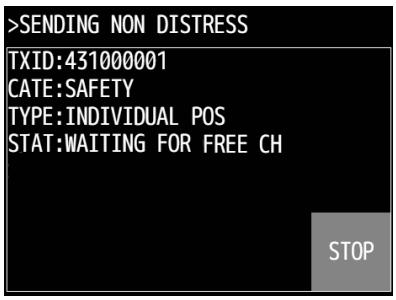
■ Procedure ■

1. Select SAF/INDV/POSRQ in CALL TYPE and input an address.



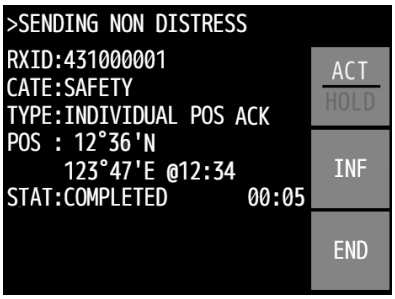
2. Touch the [CALL] button to transmit the position request call.

   After checking the channel free, the safety position request call is sent and the screen at right is displayed.



3. When acknowledgement is received, the receiving mark flashes and the alarm sounds. After silencing it with the [STOP] button, a received screen as shown at right appears.

   The position data of the station is indicated in the Position field usually, and this procedure is complete. However note that even though the call is sent normally, the acknowledgement may not be received from the called station for some reason.



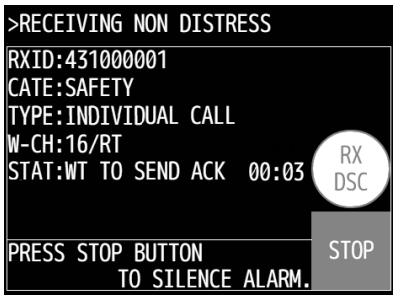
4.4.2 Receiving safety or urgency individual calls

When receiving an individual DSC call from a coast or ship station, according to the message, perform the following procedures as appropriate.

■ Procedure ■

The receiving screen at right is displayed, and the receiving mark flashes and the alarm grows louder gradually.

- If no procedure exists, starts operating the received message as the active procedure automatically.
- In the case of an urgency call, the alarm is stopped by pressing the [STOP] button.
- After that, similar as the routine individual calls mentioned above except to use CH16 basically.



4.4.2.1 Receiving special safety individual calls

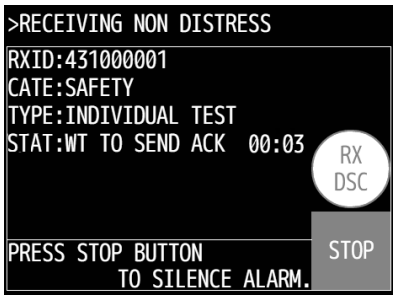
(test calls and position request calls)

(1) Receiving safety test calls

■ Procedure ■

The receiving screen at right is displayed, and the receiving mark flashes and the alarm grows louder gradually.

- If there was no immediate previous transmission, and TEST in the AUTO ACK menu (MENU>SETUP>DSP OPE) is ON, then automatic acknowledgement is done.
- To do a manual acknowledgement, stop the alarm with the [STOP] button, and then touch the [ACK] button.

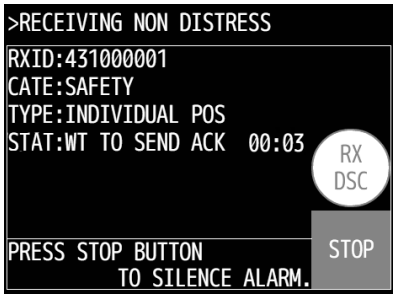


(2) Receiving safety position request calls

■ Procedure ■

The receiving screen at right is displayed, and the receiving mark flashes and the alarm grows louder gradually.

- If there was no immediate previous transmission, and POSITION RQ in the AUTO ACK menu (MENU>SETUP>DSP OPE) is ON, then automatic acknowledgement is done.
- To do a manual acknowledgement, stop the alarm with the [STOP] button, and then touch the [ACK] button.
- To transmit a non-acknowledgement, touch the [NACK] button.



4.4.3 Safety or urgency all ships calls

The DSC safety all ships calls can be made as follows.

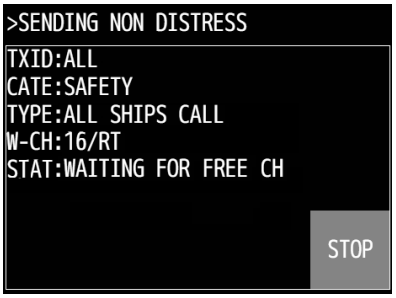
■ Procedure ■

1. In the main menu, touch the [CALL] → [EDIT] → [CALL TYPE] buttons. Select SAF/ALL/RT or URG/ALL/RT and then press the [✓] button.

   Change the working channel, if required.

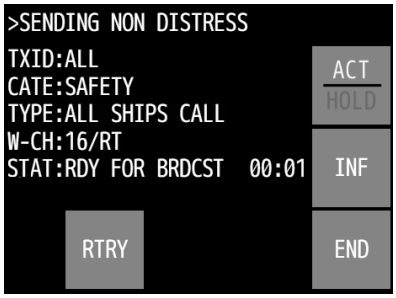
2. Touch the [CALL] button to transmit.

   After checking that the channel is free, the message is sent.

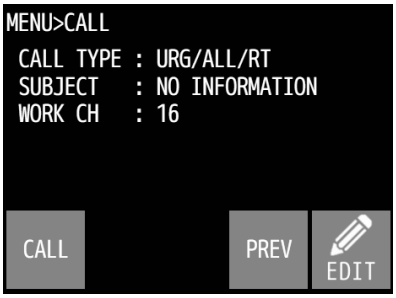


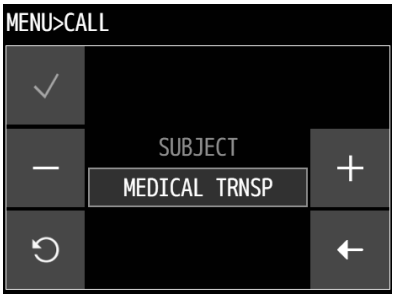
3. After sending the message, the working channel is set and the DSC calling procedure is finished.

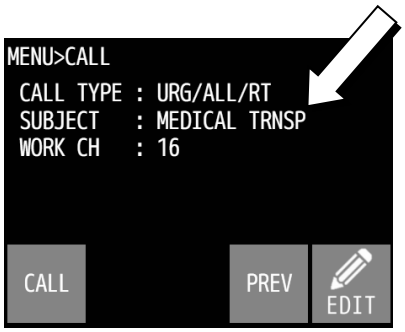
   Start broadcasting using the handset.



Note For an urgency call, touch the [EDIT]→[SUBJECT] buttons for a special subject, then use the [+]/[-] buttons to select a subject and enter it with the [✓] button. You can indicate you are a medical transport (MEDICAL TRNSP) or a neutral ship (NEUTRAL SHIP).





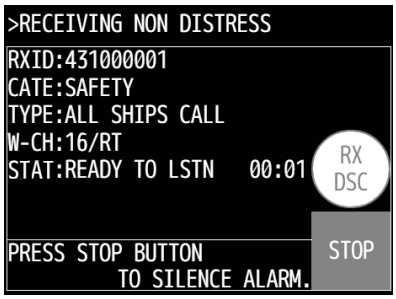


To use this function, you must set the MDCL USE menu (MENU>SETUP> DSP OPE>) or the NEUT USE menu (MENU>SETUP>DSP OPE) to ON after powering on the equipment.

4.4.4 Receiving safety or urgency all ships calls

■ Procedure ■

The receiving screen at right is displayed, and the receiving mark flashes and the alarm grows louder gradually.



- If no procedure exists, starts operating the received message as the active procedure automatically.
- When the working channel is changed, the popup screen is displayed to notice it.
- To stop the urgency alarm, touch the [STOP] button.

Note If you have received an urgency call, use the [INF] button to confirm the topic of the message received in the transmission as either medical transport (MEDICAL TRNSP), neutral ship (NEUTRAL SHIP) or no information (NO INFORMATION).

4.4.5 Distress alerts

When in distress, press the dedicated DISTRESS button to send a distress alert. The distress alerts transmit own MMSI, ships position, time of the position, and the nature of distress.

⚠ CAUTION

Do not test the distress alert as doing so may inconvenience local shipping and Rescue Centers.

When sending a distress alert, follow the instructions of the ship's captain or officer in charge.

If a false distress alert is transmitted accidentally, use the [CANCEL] button to cancel transmission of the distress alert. And then report the false distress alert to a nearby RCC (Rescue Coordination Center, in Japan, inform the nearest Japan Coast Guard.) Information to be reported:

Ship's name, type, nationality, and ID number, the date/time, location and reason why the false distress alert was transmitted. Also, report the unit model name and manufacture number/date, if possible.

4.4.5.1 Quick distress alerts

The following describes the procedure to send a distress alert immediately without using menus. In this case, the nature of distress in the message is sent as "UNDESIGNATED" by default. Further, if no information for the position and the time of position obtained within 23.5 hours, these information is composed automatically as "9999999999" and "8888" respectively.

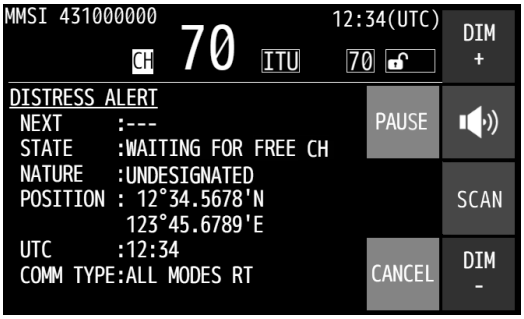
■ Procedure ■

1. Open the DISTRESS button cover on the controller.

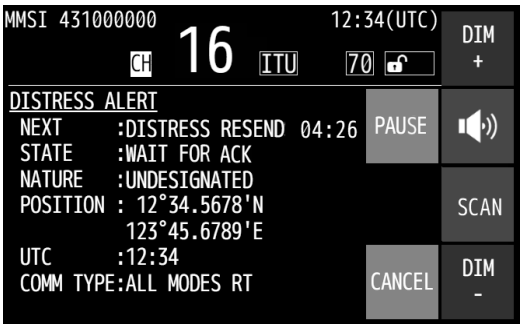
2. Press and hold the DISTRESS button for at least 3 seconds until the countdown is completed.

3. The distress alert is sent.

The time required to complete the transmission is about two seconds.



4. After sending the distress alert, wait for the acknowledgement in the condition of the activated distress transmission procedure.



- Unless an acknowledgement is received or the distress alert is cancelled manually, the distress alert repeats automatically in a variable interval every 3.5 to 4.5 minutes. (The time until next sending is shown at Next.)
- During this time, you can retransmit a distress alert manually by pressing the DISTRESS button again or using the radiotelephone.
- Option menus are available as follows.

  PAUSE: Makes the distress mode pause.

  CANCEL: Starts the distress alert cancelling procedure, which is needed to send the DSC acknowledgement and to broadcast from the own ship

5. When acknowledged, the screen at right is displayed.

- The receiving mark blinks and the alarm sounds.
- Press the [STOP] button to silence the alarm and then transmit using the handset.
- First, the responding station will call on the CH16. Then acknowledge the receipt as follows.
  - Say "MAYDAY",
  - Say "this is",
  - Own ship's MMSI and call sign, position, nature of distress, and rescue requests

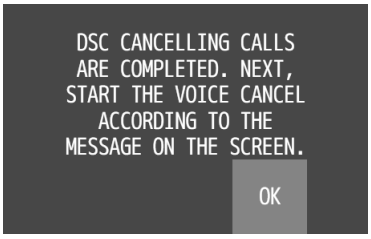
Note

If cancelling the distress alert since a false distress alert is transmitted accidentally, perform the distress alert cancelling procedure as follows.

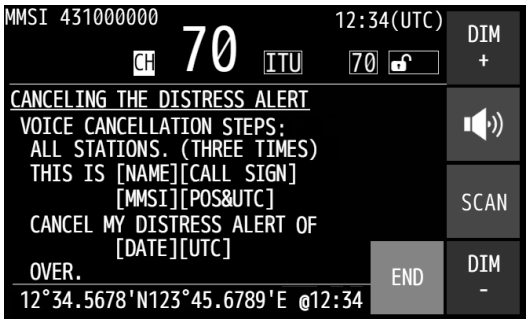
1. Touching the [CANCEL] button in the transmission screen for the distress alert opens the popup screen shown at right.

2. Touch the [CONT] button.
   Sends the distress acknowledgement to own ship.

3. After DSC acknowledgements are complete, the popup screen shown at right appears.



4. According to the guidance on the screen, broadcast to cancel the distress alert.



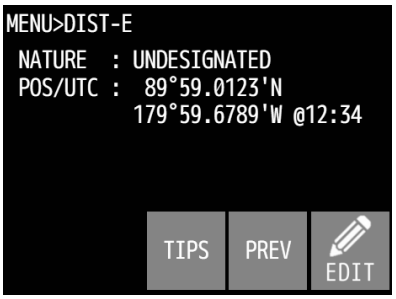
5. Touch the [END] button when the broadcast to cancel the distress alert is complete.
   The distress mode ends.

4.4.5.2 Distress alerts from the menu

The following describes the procedure to send a distress alert with the nature of distress selected in the menu. Also, if there is no valid information regarding the position and the time of position, the manual input is available in that menu.

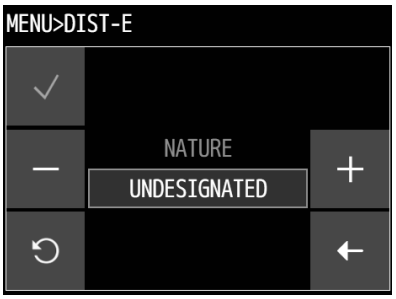
■ Procedure ■

1. In the main menu, touch the [DIST-E] button.



The nature of distress is displayed as UNDESIGNATED as a default value. If the position information is input automatically by a GPS type device, or has already been input manually, that information is also displayed.

2. Touch the [EDIT]→[NATURE] buttons.



Use the [+]/[-] buttons to select the nature of distress from those below and then use the [✓] button to enter it.

Nature of distress	Contents
FIRE	Fire, explosion
FLOODING	Flooding
COLLISION	Collision
GROUNDING	Grounding
LISTING	Listing, in danger of capsizing
SINKING	Sinking
DISABLED	Disabled and adrift
UNDESIGNATED	Undesignated distress
ABANDONING	Abandoning ship
PIRACY ATTACK	Piracy/armed robbery attack
MAN OVERBOARD	Man overboard

If the valid position and time of the position are already displayed, skip to step 6 because no entry is needed.

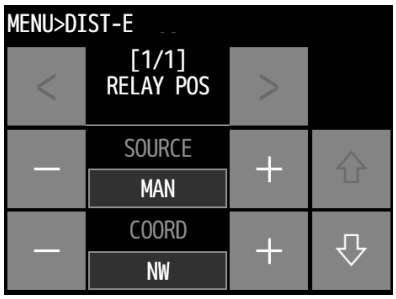
3. Touch the [EDIT]→[POS] buttons.

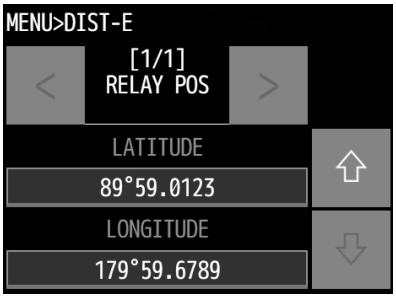
Use the [↑]/[↓] buttons to display the setting items and use the [+]/[-] buttons to select a value, and then use the [✓] button to enter it. You can adjust the various setting items in the following ranges.

SOURCE: Select how to acquire position information from below.
GPS (GPS or other navigational equipment)/MAN (manual input)/CL (not displayed)

COORD: Select the coordinates from below.
NE, NW, SE, SW

LATITUDE: Manually input the latitude.
LONGITUDE: Manually input the longitude.

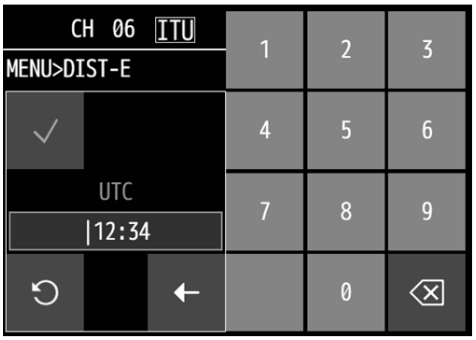


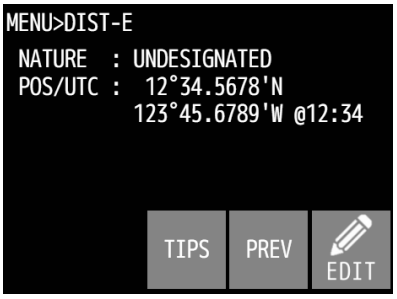


4. Touch the [EDIT]→[UTC] buttons.

Input the date acquired from the position information.

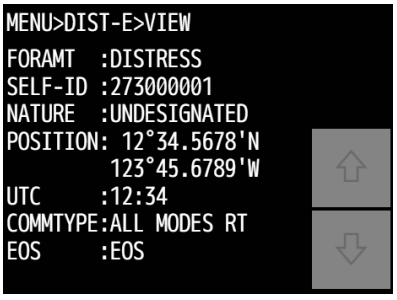
Use the [✓] button to enter the setting.





5. To view the details of the message being transmitted, touch the [PREV] button.

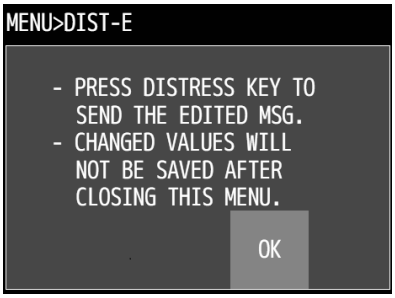
After confirming, use the [←] button to return to the previous screen.



6. Open the DISTRESS button cover.

7. Press and hold the DISTRESS button for at least 3 seconds until the countdown is completed.

Note
- The rest of the procedure is the same as described in the "Quick distress alert".
- The precautions about operations of this screen using the [TIPS] button in procedure 4 as follows.



4.4.5.3 Receiving distress alerts

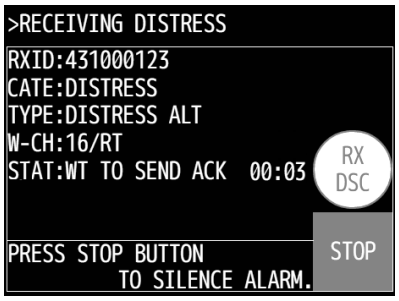
When a distress alert is received from another ship, displays the event immediately with the specific two-tone alarm sound.

⚠ WARNING

If a distress alert is received, make sure to inform the ship's captain or officer in charge. Doing so may save the lives of the crews and passengers on the ship in distress.

■ Procedure ■

1. When a distress alert is received, the distress message is displayed.



   - The receiving mark blinks and the alarm gradually grows louder. Also, the message for this example is shown below.
   - If no procedure exists, starts operating the received message automatically.

2. Touch the [STOP] button to stop the alarm and display the screen at right.

   - The screen at right is displayed. Keep watch for at least 5 minutes, and then notify the coast station as appropriate.
   - Select a process with the buttons.

     [ACK]: Sends the acknowledgement to the distress alert.
     [RLY]: Sends the distress relay.
     [INF]: Indicates the received distress message.
     [ACT/HOLD]: Holds or releases hold on the transmission that is in progress.
     [END]: Terminates the procedure.

Note

- The distress acknowledgement is normally sent from a coast station. However after consulting with the RCC or a coast station and being directed, it is possible to acknowledge the ship in distress from your own ship.
- After sending the acknowledgement, start communicating with the ship in distress according to the following procedure.
  - Say "MAYDAY".
  - Repeat the identity (MMSI) of the ship in distress 3 times
  - Say "This is..."
  - Repeat the identity (MMSI) of your ship 3 times
  - Say "RECEIVED MAYDAY".

- The distress relay calls may be received without receiving the distress alert. In this case, keep watch the CH16 and handle the message using the displayed options as appropriate.

4.4.6 Distress relay calls on behalf of someone else (DROBOSE)

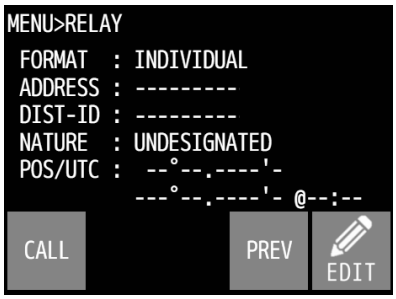
If another ship is in distress but is itself unable to make a distress alert, and the master of the ship considers that further help is necessary, the distress relay call on behalf of the ship can be transmitted using "DSC drobose call" menu. In this case, compose a distress relay call format by inputting the MMSI (if known), the ship's position and the time of position (if known), and the nature of distress to send to all ships or a coast station.

⚠ CAUTION

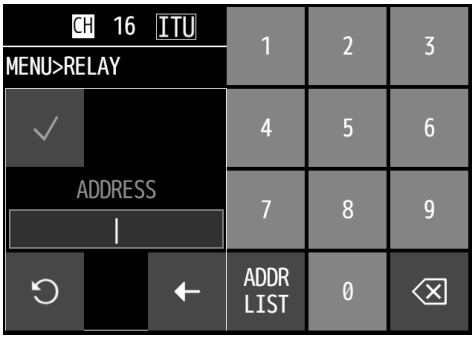
When transmitting these calls, absolutely do not operate the DISTRESS button. Doing so may cause a false distress alert.
(Transmission can be sent via the [CALL] button displayed on the screen.)

■ Procedure ■

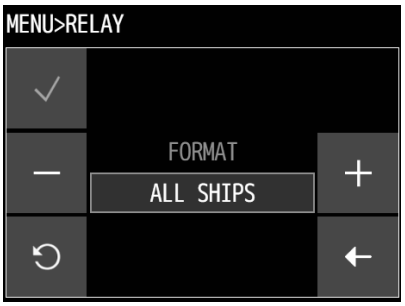
1. In the main menu, touch the [RELAY] button.



2. To individually call a coast station, touch the [EDIT]→[ADDR] buttons, input your MMSI, and use the [✓] button to enter the settings.



If sending an all ships call, use the [EDIT]→[FORMAT] buttons to select ALL SHIPS and use the [✓] button to enter the settings. Also, after you touch the [EDIT] button the [ADDR] button is hidden.

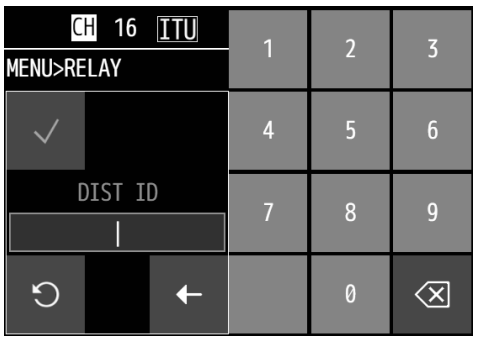


3. Input the distress ID (MMSI), nature of distress, position and time if you know them, and then enter the settings with the [✓] button.

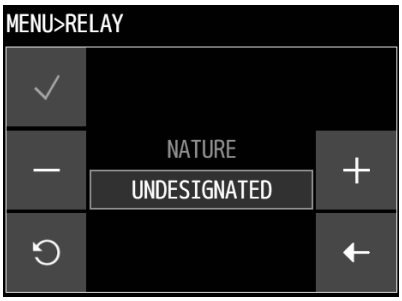
   Distress ID: [EDIT]→[DIST ID] buttons
   Nature of distress: [EDIT]→[NATURE] buttons
   Position: [EDIT]→[POS] buttons
   Time: [EDIT]→[UTC] buttons

The nature of distress is selectable from below.

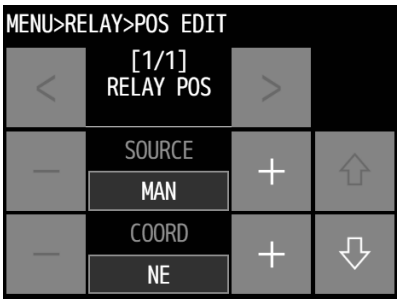
Nature of distress	Contents
FIRE	Fire, explosion
FLOODING	Flooding
COLLISION	Collision
GROUNDING	Grounding
LISTING	Listing, in danger of capsizing
SINKING	Sinking
DISABLED	Disabled and adrift
UNDESIGNATED	Undesignated distress
ABANDONING	Abandoning ship
PIRACY ATTACK	Piracy/armed robbery attack
MAN OVERBOARD	Man overboard
EPIRB EMISSION	Received DSC VHF EPIRB signal

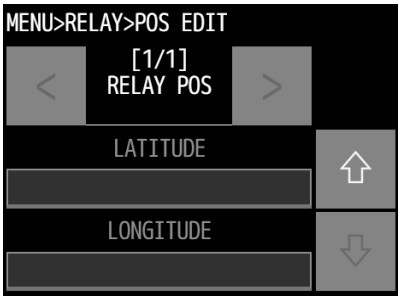


Distress ID

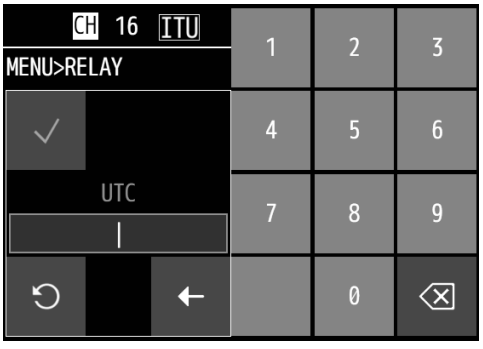


Nature of distress





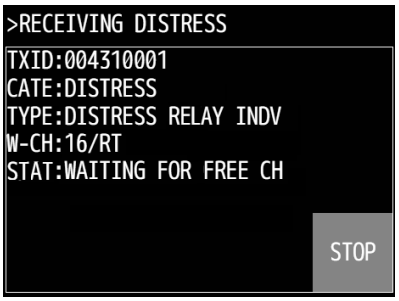
Position



Time

4. After inputting the information, touch the [CALL] utton.

After checking the channel free, starts sending the drobose call and the procedure displaying the screen as shown at right.



5. When receiving the acknowledgement from the coast station, the screen shows as shown at right.

- The receiving mark blinks while the alarm sounds.
- After touching the [STOP] button to stop the alarm, do the distress call.

Note In the case of receiving the drobose call, the call is handled as the distress relay call because the message form of the drobose is just the distress relay message.

4.5 DSC call log

Received DSC messages are classified as distress messages and as other messages. The 20 most recent messages for both types of received and transmitted are saved in the log.

⚠ CAUTION

In order to avoid accidental distress message treating, received distress messages will be erased automatically after 48 hours elapsed since the reception. Accordingly, if such messages cannot be read out, it is NOT a malfunction.

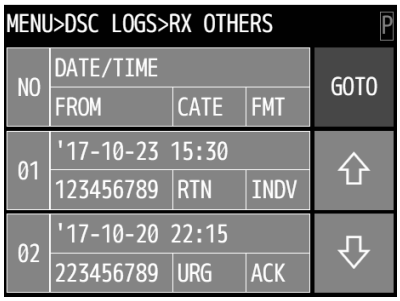
4.5.1 Received distress messages

Received messages regarding distress alerts and the acknowledgements, distress relay calls and the acknowledgements are displayed in this received distress message log. However when receiving a distress alert containing the same 5 messages, only one of those is stored.

■ Procedure ■

1. In the main menu, touch the [DSC LOGS] →[RX DIST] buttons.

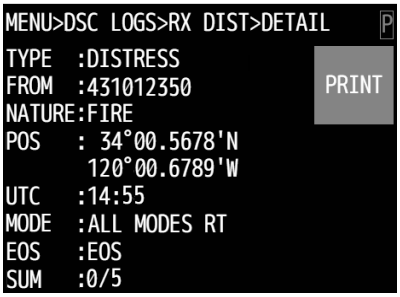
   - In the event of a message that has a receiving error (ECC error), "ECC ERROR" appears in the TYPE field.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the message, and then touch the [LIST] button.

   The selected message is displayed.

   - "SUM" displays the number of distress transmissions.



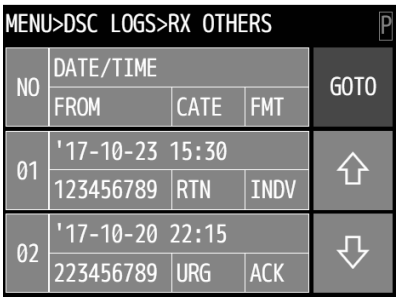
4.5.2 Received other messages

Received messages regarding routine, safety, and urgency calls or the acknowledgements is displayed in this received other message log.

■ Procedure ■

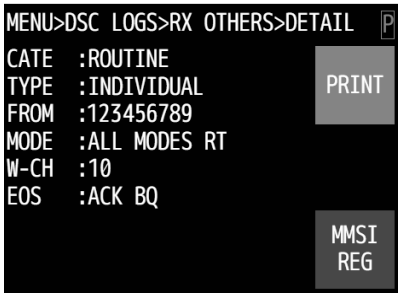
1. In the main menu, touch the [DSC LOGS] →[RX OTHERS] buttons to display it.

   ➢ In the event of a receiving error (ECC error), "ERR" is indicated in the CATE (category) field.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the message, and then touch the [LIST] button.

   Display the details of the message of the number you touched.
   Also the [MMSI] button is used for the registration of the caller's ID.

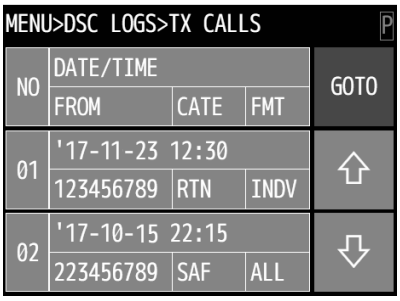


4.5.3 Transmitted messages

Every transmitted message is displayed in this transmitted message log.

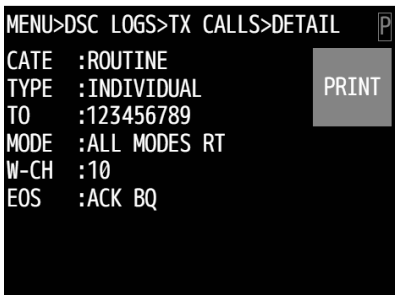
■ Procedure ■

1. In the main menu, touch the [DSC LOGS] →[TX CALLS] buttons.



2. Use the [↑]/[↓] buttons or the [GOTO] button to display the message, and then touch the [LIST] button.

   The selected message is displayed.



4.6 Other features

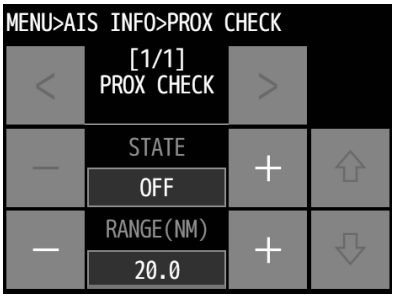
In addition to the features described above, the equipment contains useful some features as below.

4.6.1 Notification of registered ships by the AIS

If your system is linked to AIS and the following settings and the AIS FUNC menu (MENU>SETUP) are set so that this information can be used, then you can use the auxiliary screen to immediately notify nearby ships that are pre-registered.

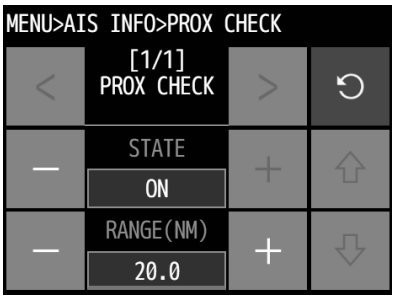
■ Procedure ■

1. In the main menu, touch the [AIS INFO] → [PROX CHEC] buttons.

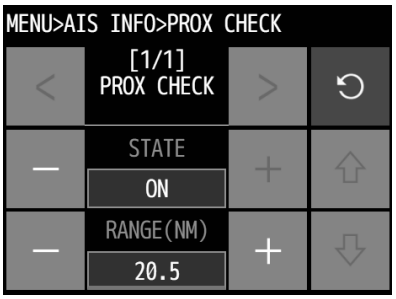


Note The example at right shows the factory default setting.

2. Change the STATE to ON using the [+]/[-] buttons.

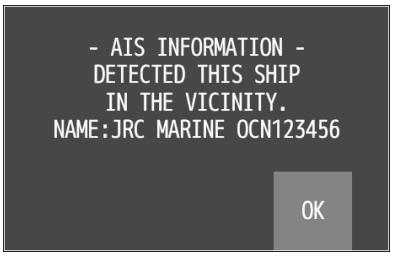


3. Use the RANGE (NM) [+]/[-] or editing buttons to change the range (radius) in which ships are detected from 0.1 to 99.9 NM.



4. Finally, touch the [✓] button to register.

Note When AIS detects a ship that is an AIS registered ship, you are notified by the popup screen as shown at right.
However, if the AIS information does not contain the ship's name, the NAME line is replaced by the MMSI number.



4.6.2 Playback of received voice

When the squelch is open, incoming audio is automatically recorded (up to 480 seconds), and can be replayed to confirm audio communications. Recorded audio is divided into multiple tracks depending on the time for the squelch open/close, and stored until power off. If the total recorded time of all tracks reaches 480 seconds, the oldest recorded track is overwritten.

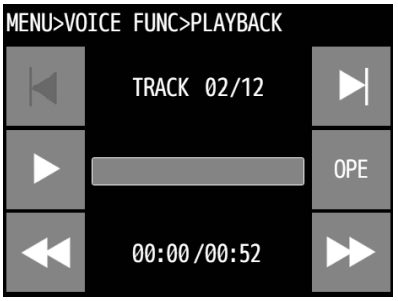
(1) Replay and stop operations

■ Procedure ■

1. In the main menu, touch the [VOICE FUNC] → [PLAY-BACK] buttons.

   - If existing any recorded tracks, replays the latest track immediately.
   - The example at right shows the following.
     - Replaying track number: 1
     - Total track numbers: 12
     - Counter value (elapsed time): 2 seconds
     - Recorded time of the track: 36 seconds

2. After finishing the playback of a track, the next track is displayed and the playback mode stops.



Operating procedure

- Shows the previous track.
- Shows the next track.
- Plays the track that is shown.
- Pauses the track that is being played.
- OPE Shows the operation buttons (SAVE, ERASE).
- Rewinds the track that is being played.
- Fast forwards the track that is being played.

(2) Fast forward and rewind operations

During playback, the fast forward or rewind is available by the following procedure.

■ Procedure ■

1. Touch ▶▶ or ◀◀ during playback.
   - Touching ▶▶ fast forwards and increases the counter value.
   - Touching ◀◀ rewinds and decreases the counter value.
2. Touching ▶ starts playback from the time on the counter.

(3) Temporary track saving

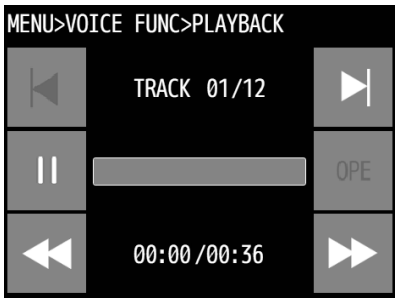
Normally, when the total recorded time of all tracks reaches 480 seconds, the oldest track is overwritten by a new track. However the track can be saved temporarily using the following procedure until power off.

■ Procedure ■

1. In the stop mode, use ⏮ or ⏭ to display the track you want to temporarily save.

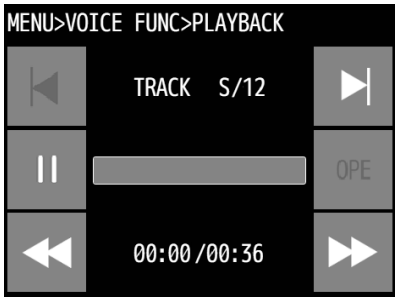
   The example at right shows the case of track 1 selected.

   Note Only 1 track can be saved.



2. Touch the [OPE] → [SAVE] buttons.

   - A beep sounds when saving is complete, and the track number changes from "01" to "S", as is shown at right.
   - The saved track is registered as the last number. In the example at right, it is track 12.



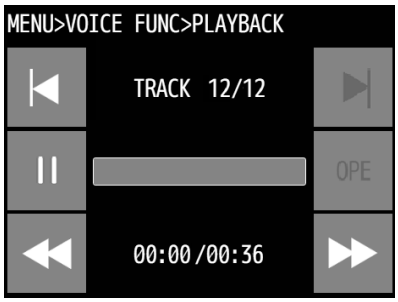
   Note When completed the saving, the subsequent track numbers is shifted down by 1.

(4) The saved track deletion

To delete a saved track, perform the following procedure. (Powering off deletes all tracks.)

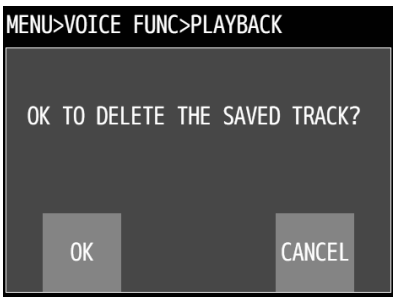
■ Procedure ■

1. In the stop mode, use |◀ or ▶| to display the track you want to delete.



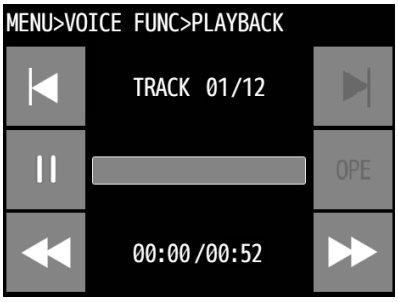
2. Touch the [OPE] → [ERASE] buttons.

   The confirmation message is appeared.



3. After confirming the message, touch the [OK] button to delete the saved track.

   After deleting is complete, track 1 appears, as shown at right.

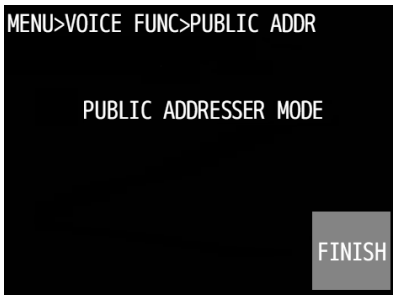


4.6.3 Public Address function with an external speaker (option)

If an external speaker (NVS-423R) is connected, the Public Address function is available to make an announcement over the external speaker. While the Public Address function is in use, incoming audio will not be recorded when the squelch is opened.

■ Procedure ■

1. Lift the handset from the cradle and then touch the [MENU]→[VOICE FUNC]→[PUBLIC ADDR] buttons.



   - The PA mode is started and enabled to make an announcement over the external speaker.
   - Press PTT key to talk.
   - To finish the public address function to display the status display, replace the handset on hook. (If you touch the [FINISH] button and exit, the screen returns to the previous screen.)

Note In this mode, radio wave is not transmitted by PTT.

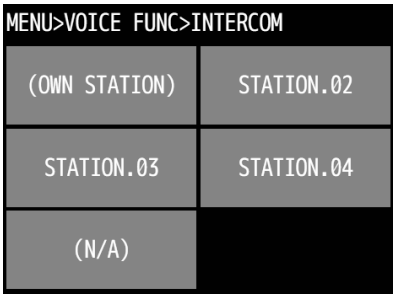
4.6.4 Intercom

If multiple controllers (NCM-980) are connected, you can use the handset to talk between the main unit and a controller or between two controllers. While the intercom function is in use, incoming audio will not be recorded when the squelch is opened.

(1) Calling and talking

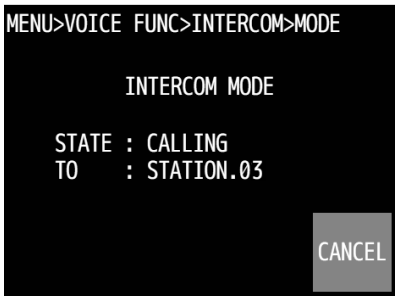
■ Procedure ■

1. Lift the handset from the cradle and then touch the [MENU]→[VOICE FUNC]→[INTCOM] buttons.



- The main unit and controllers list is displayed.
- The example at right shows that the following controllers are connected.
  - Address 1: Calling main unit
  - Address 2: Station.02
  - Address 3: Station.03
  - Address 4: Station.04
  - Address 5: Not connected

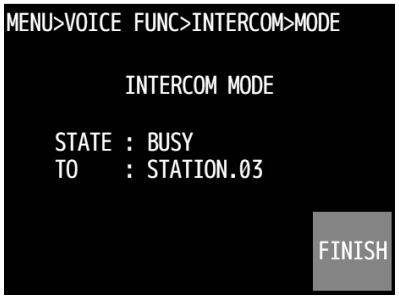
2. Touch the button of the controller you want to call.



- The screen at right is displayed and the intercom call is started.
- Putting the handset on-hook during a call, ends intercom mode, and returns you to the status display.
- Touching the [CANCEL] button during a call, ends intercom mode, and returns you to the screen in step 1.

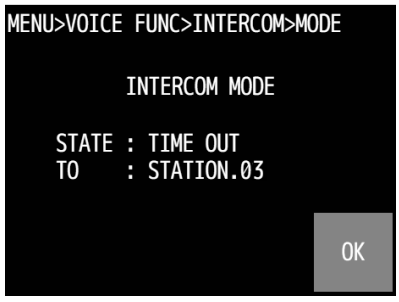
Note

- If the handset of the recipient is left off-hook, the call is not started and the screen at right is displayed. Touching the [FINISH] button at this point returns you to the screen in step 1.

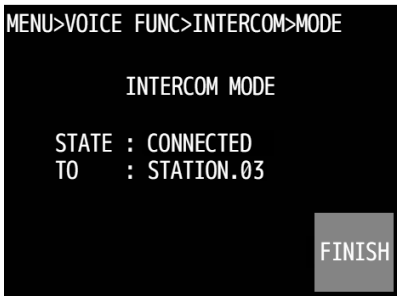


.

- If not answered within 30 seconds, the screen at right is displayed. Then touch the [OK] button returns you to the screen in step 1.



3. After answered the phone, the screen shown at right is displayed and enabled to start the communication.

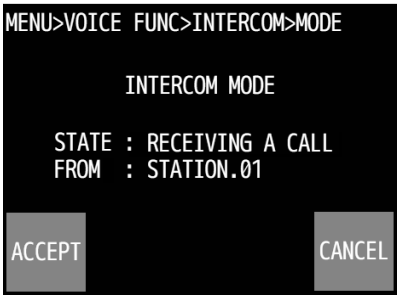


- Press PTT key to talk.
- To finish the intercom, replace the handset on hook.
- Touching the [FINISH] button at this point returns you to the screen in step 1.

(2) Receiving a call from another controller

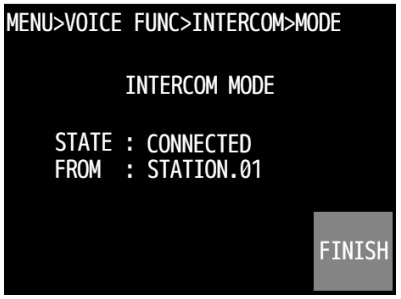
■ Procedure ■

1. If received an intercom call, the screen at right is displayed and the ringing is started.



   If not answer within 30 seconds, the screen returns to the previous screen. Also, if you touch the [CANCEL] button, the screen returns to the previous screen. Touch the [ACCEPT] button to enter the CONNECTED state.

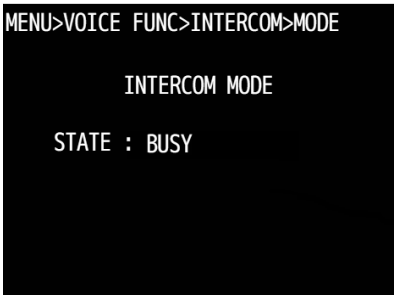
2. When answering to the call, lift the handset and start the communication.



   - Press PTT key to talk.
   - To finish the intercom, replace the handset on hook.
   - Touching the [FINISH] button at this point returns you to the screen in step 1.

Note

- The OCC mark remains displayed even while talking, because the called controller (recipient) is in monitor mode.
- While using the intercom function between two of controllers, if the other controllers are connected, those screens display as shown at right.



4.6.5 Talk with a Bluetooth device (option)

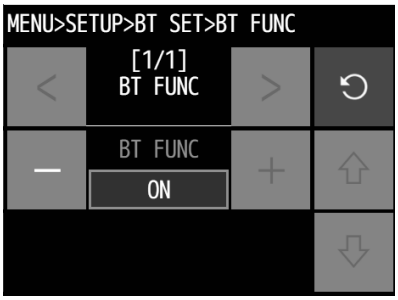
You can connect the optional Bluetooth device to the main unit via Bluetooth and then make calls. Refer to the instruction manual of the device for instructions. In addition, the maximum time you can talk continuously is 5 minutes, so please retry the operation after 5 minutes. Also, if the PTT button of the handset is pressed during a call, the access right will be transferred to the handset, so it will not be possible to speak from the Bluetooth device.

(1) Pairing

■ Procedure ■

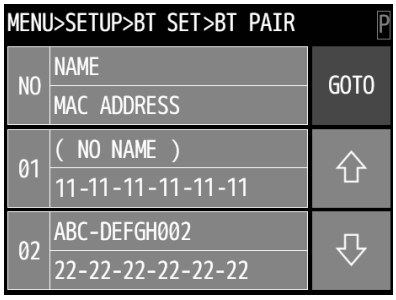
1. Put the Bluetooth device in pairing mode (refer to the instruction manual of the device for instructions).

2. If the or is not displayed on the main unit, in the main menu on the main unit, touch the [SETUP] → [BT FUNC] buttons and change to ON using the [+] button and then touch the [✓] button to register,



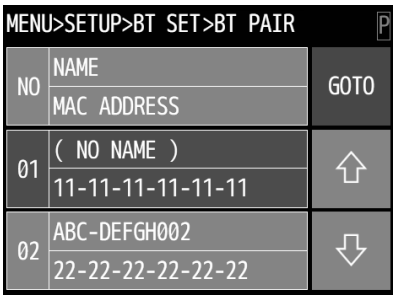
.

3. In the main menu on the main unit, touch the [SETUP] → [BT SET]→ [BT PAIR] buttons.



   - The "SEARCHING DEVICE AUTOMATICALLY." popup screen appears.
   - When the search is complete, the names of Bluetooth devices and the MAC address appear.
   - If nothing is found, "NO DATA" is displayed.
   - Devices that are paired appear at the top (01) and the background turns blue.
   - Pairing information can be registered for only one device. If you register a second device, the information for the first device is deleted.

4. Use the [↑]/[↓] buttons or the [GOTO] button to display the device you want to pair, then touch the [LIST] button.



   - If pairing is successful, the appears.

Note If pairing does not finish, please retry the operation..

(2) Making calls

1. Turn on the power to the paired Bluetooth device.

2. Press and hold the PTT button while you talk. Release the PTT button to hear the other party.

5. SETTINGS & REGISTRATIONS

This chapter describes the procedure for settings and registrations for the date and time manually, the contact lists for DSC calls, advanced DSC settings, and other settings for the equipment.

5.1 Date and time setting

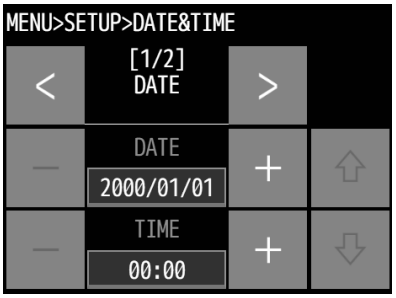
Normally, the date and time are updated automatically if importing GPS information. But if necessary, input these parameters manually as follows.

⚠ CAUTION

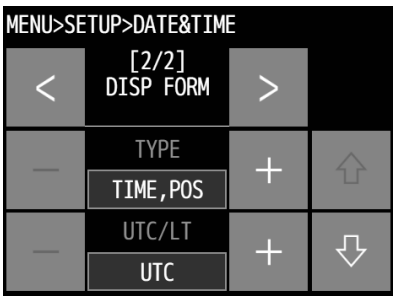
The time that is set here is the present time, and is not reflected in the time in the POS/TIME (MENU>SETUP) menu (time for the position information when the ship is in said position).

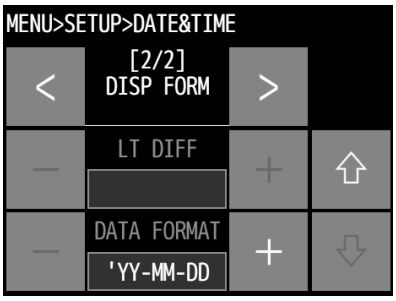
■ Procedure ■

1. In the main menu, touch the [SETUP] → [DATE&TIME] buttons.



2. Display the page you want to set with the [<]/[>] buttons. Show the items you want to set with the [↑]/[↓] buttons, and then make changes using either the [+]/[-] buttons or the [Edit] button.





➢ You can adjust the setting items in the following ranges.

• [1/2] DATE

DATE: Set the date.

TIME:Set the time.

• [2/2] DISP FORM

TYPE: Select the information shown on the status display from below.

- "TIME, POS": Displays both the present time and position.
- "TIME": Displays only the present time.
- "POS": Displays only the present position.

UTC/LT: For the time shown on the status display, select either universal time coordinated (UTC)

or local time (LT (+), LT(-)).

LT DIFF: Select the time difference to use for calculating the local time to display.

DATA FORMAT: Select a date format to use for the DSC saved message lists, alarm history, etc., from below.

- " 'YY-MM-DD": Displays January 23, 2017 as '17-01-23.
- " MMM DD,'YY": Displays January 23, 2017 as Jan 23,'17.
- " DD MMM,'YY": Displays January 23, 2017 as 23 Jan,'17.

3. Finally, touch the [✓] button to confirm.

5.2 Own ship position and time setting

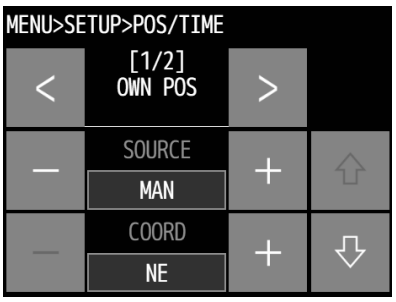
Normally, the ship's position and the time are updated automatically if importing GPS information. But if necessary, input these parameters manually as follows.

⚠ CAUTION

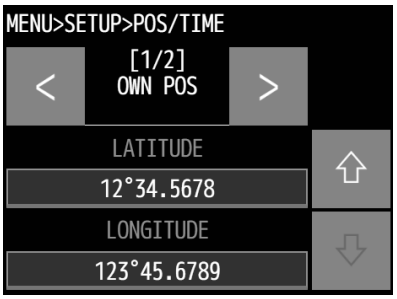
The time that is set here is the time for the position information when the ship is in said position, and is not reflected in the time for the PRE TIME (present time) in the DATE & TIME (MENU>SETUP) menu.

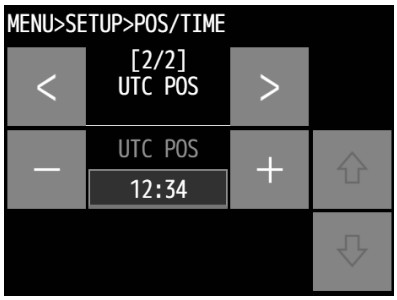
■ Procedure ■

1. In the main menu, touch the [SETUP] → [POS/TIME] buttons.



2. Display the page you want to set with the [<]/[>] buttons. Show the items you want to set with the [↑]/[↓] buttons, and then make changes using either the [+]/[-] buttons or the [Edit] button.





➢ You can adjust the setting items in the following ranges.

• [1/2] OWN POS

SOURCE: Select how to acquire position information from below.
GPS (GPS or other navigational equipment)/MAN (manual input)/CL (not displayed)

COORD: Select the coordinates from below.
NE, NW, SE, SW

LATITUD: Manually input the latitude.

LONGITUDE: Manually input the longitude.

• [2/2] UTC POS

UTC POS: Input the date acquired from the position information.

3. Finally, touch the [✓] button to confirm.

Note

- After the position and the time information are input manually, that information is not overwritten with an external device, such as a GPS, automatically.
- To be able to do automatic updates with the information input from the GPS or other navigational equipment after manual input, make GPS the SOURCE.
- If the position and the time information are not received within 10 minutes after powering on, or after 10 minutes elapsed since interrupted, the alarm screen may appear. Further, regardless of either manually or automatically if not updated the position and the time within 4 hours after the last entry, the alarm screen also appears.

5.3 Settings for each device

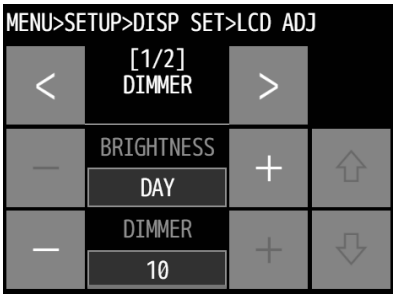
The following describes setting the screen's clarity, the handset's receiving volume, etc.

5.3.1 LCD adjustment

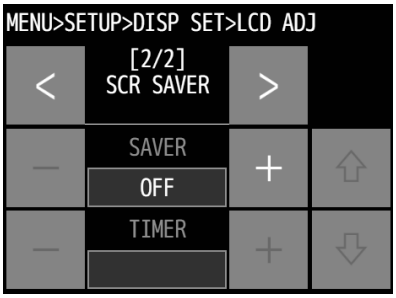
The LCD conditions for viewability are adjustable as follows.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [LCD ADJ] buttons.



2. Display the items you want to adjust with the [<]/[>] buttons. Use either the [+]/[-] buttons or the [Edit] button to select them.



   ➢ Set each item within the ranges given below.
   - [1/2] DIMMER
     - BRIGHTNESS: DAY/DUSK/NIGHT
     - DIMMER: 0 - 14
   - [2/2] SCR SAVER
     - SAVER: ON/OFF
     - TIMER: 1 - 999 seconds

3. Finally, touch the [✓] button to confirm.

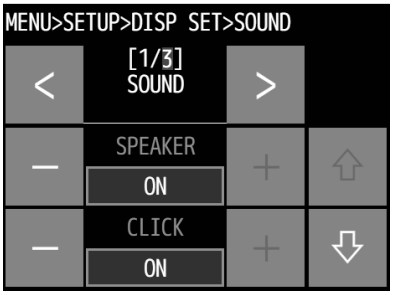
Note When set to 0 with the DIMMER function, only the buttons at the 4 corners are enabled.

5.3.2 Sound settings

The sound settings such as the click beep are adjustable as follows.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [SOUND] buttons.



2. Display the page you want to set with the [<]/[>] buttons. Show the items you want to set with the [↑]/[↓] buttons, and then make changes using either the [+]/[-] buttons or the [Edit] button.

   ➢ Set each item within the ranges given below.

   • [1/3] SOUND
   - SPEAKER: ON/OFF
   - CLICK: ON/OFF
   - PHONE-F LEV: 1 - 8
   - PHONE-R LEV: 1 - 8 *Is not shown on the controller.

   • [2/3] SOUND
   - NOTIF LEV: 1 - 8

   • [3/3] SOUND
   - EQUALIZER: 1 - 6 *Equalizer function does not operate for setting value 1.

3. Finally, touch the [✓] button to confirm.

5.3.3 User key assignment

The User (the FAVORITE button and the function buttons that are displayed when the FUNC button on the Status display is touched) key can be used as the programmable key for the shortcut menu key of the desired hierarchical menus, or for the key of the special functions (see the following * marked descriptions).

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [KEY ASSIGN] buttons.

Note Touching the [FAVORITE] button while in the factory default settings shows the above menu.

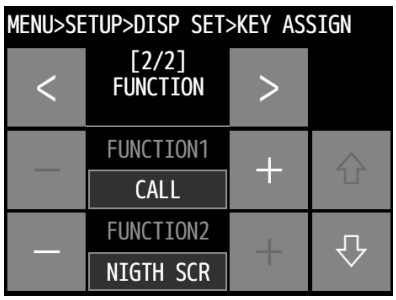
2. Using the [+]/[-] buttons, select the menu to register to the [FAVORITE] button.

Finally, touch the [✓] button to confirm.

The assignable menus and functions are as follows.

1	CALL	MENU	21	ALARM INFO	MENU>MAINT
2	RELAY	MENU	22	SYSTEM INFO	MENU>MAINT
3	DIST-E	MENU	23	DSC AF CHECK (DSC AF)	MENU>MAINT
4	TEST CALL	MENU	24	DATE&TIME	MENU>SET UP
5	DSC LOGS	MENU	25	POS/TIME	MENU>SET UP
6	SHIPS LIST	MENU>SET UP>CALL LIST	26	DISP SET	MENU>SET UP
7	PROX CHECK	MENU>AIS INFO	27	BT SET	MENU>SET UP
8	PLAYBACK	MENU>VOICE FUNC	28	CALL LIST	MENU>SET UP
9	PUBLIC ADDR	MENU>VOICE FUNC	29	DSC OPE	MENU>SET UP
10	INTCOM	MENU>VOICE FUNC	30	AUTO ACK	MENU>SET UP>DSC OPE
11	SCAN	MENU>CH OPE	31	GROUP ID	MENU>SET UP>DSC OPE
12	DUAL WATCH	MENU>CH OPE	32	INACTV T/O	MENU>SET UP>DSC OPE
13	TRIPLE WATCH (TRPL WATCH)	MENU>CH OPE	33	PRN PROP	MENU>SET UP
14	CH LIST	MENU>CH OPE>MEMORY CH	34	CH MONITOR	*Open the squelch temporarily
15	PRIV CH	MENU>CH OPE	35	BT SWITCH	*Turn on / off the Bluetooth sound output
16	WEATHER CH	MENU>CH OPE	36	DAY SCREEN	*Invert black and white on the screen
17	REGION	MENU>CH OPE			
18	CH SQL SET	MENU>CH OPE			
19	SELF DIAG	MENU			
20	DSC LOOP	MENU>SELF DIAG			

3. To register an item to the FUNC button, use the [<]/[>] buttons and display page [2/2].



Use the [↑]/[↓] buttons to display the FUNC number you want to assign, and then select the function with the [+]/[-] buttons. The functions and menus that can be registered are the same as those for the FAVORITE button. And you can register "NONE" (no registration).The positions of the buttons are as follows.

FUNC 1	FUNC 2	FUNC 3
FUNC 4	FUNC 5	FUNC 6
FUNC 7	FUNC 8	FUNC 9
FUNC 10	FUNC 11	

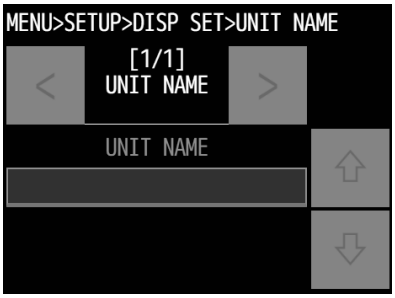
Finally, touch the [✓] button to confirm.

5.3.4 Name the device

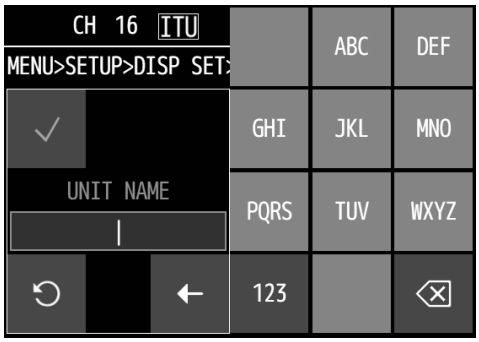
The main unit and multiple controllers can be named respectively to make identification easier.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [UNIT NAME] buttons, to show the UNIT NAME menu.



2. Touch the [Edit] button to display the text input screen.



- Up to 10 alphanumeric characters available.
- The initial value is STATIONX (X: ID1 - 5).
- The following characters are available.
  - Alphabet (capital and small letters)
  - Numbers 0 - 9
  - Spaces and the following symbols
    SP [ ] _ " # % & ' ( ) ? @ + - / = : ; < >
    (*SP: space)

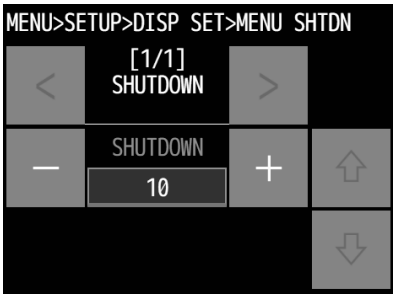
3. Finally, touch the [✓] button to register.

5.3.5 Menu shutdown timer setting

Do the following settings for closing the menu automatically when the device is left alone with the menu displayed.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [MENU SHTDN] buttons.



2. Use the [+]/[-] buttons or the [Edit] button to make changes.

   The range for settings using the [+]/[-] buttons is OFF or 01 - 60 (minutes). Select OFF when you do not want the menu to automatically close. When using the [Edit] button, input 00. In this case, OFF is displayed after setting.

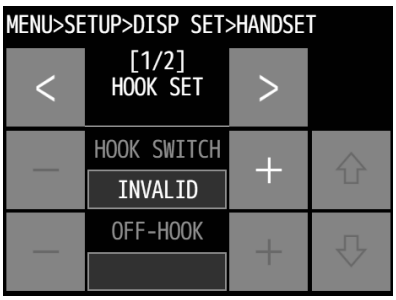
3. Finally, push the [✓] button to confirm.

5.3.6 Setting the handset

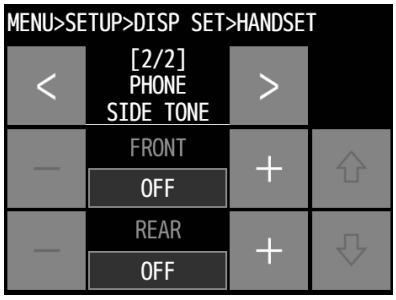
You can disable handset detection via the hook switch so as not to set to CH16 when returning the handset to the cradle (HOOK SWITCH). (As a factory default setting, the hook switch is set to “Valid”.) You can also set the feedback (PHONE SIDE TONE).

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [HANDSET] buttons.



2. Display the page you want to set with the [<]/[>] buttons, and then use the [+]/[-] buttons to select it.



   - The setting items are as follows.
     - [1/2] HOOK SET
       - HOOK SWITCH: VALID/INVALID *1,2
       - OFF-HOOK: ON/OFF
     - [2/2] PHONE SIDE TONE *3
       - FRONT: ON/OFF
       - REAR: ON/OFF

*1: When setting this menu to VALID and also setting "OFF-HOOK" to ON, if the handset is left off hook for one minute, the pop-up "REMAINING IN THE OFF-HOOK CONDITION." will be displayed.

*2: When setting to INVALID, the setting values for "OFF-HOOK" are not displayed.

*3: Feedback. When using the controller, "REAR" is not displayed.

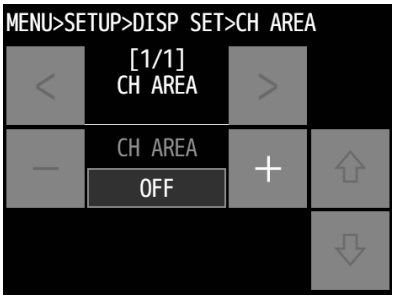
3. Finally, touch the [✓] button to confirm.

5.3.7 Setting the channel area

Do the following settings for displaying the numeric key pad (input 0 - 9) for selecting channels when the channel display area is touched on the status display.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [CH AREA] buttons.



2. Change the setting to ON using the [+]/[-] buttons.

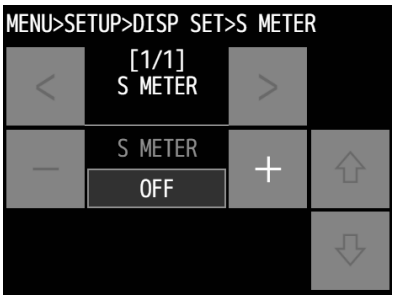
3. Finally, touch the [✓] button to confirm.

5.3.8 Setting the S meter display

Do the following settings for displaying the S meter on the status display.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [DISP SET] → [S METER] buttons.



2. Change the setting to ON using the [+]/[-] buttons.

3. Finally, touch the [✓] button to confirm.

5.4 Creating contact lists

The following describes the procedure to create the contact lists for a coast station or ship station call, or for a group call via DSC. Additionally, the PSTN number list can be created using the similar procedure.

(1) Making a new list (Example: Coast station list)

■ Procedure ■

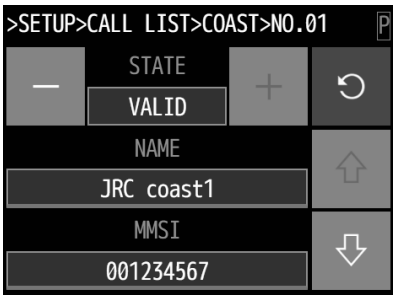
1. In the main menu, touch the [SETUP] → [CALL LIST] buttons.

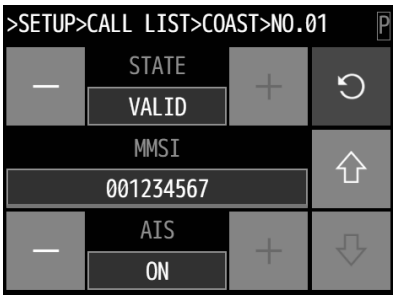
2. Touch the button of the station list to create or edit.

   The example at right shows the coast station list.
   The following is the procedure in the case of the coast station list, but is essentially the same with the case of the ship station list, the group list, or the PSTN number list.

3. Using either the [↑]/[↓] buttons or the [GOTO] button, display the station list to create or edit, and then touch the [LIST] button for that number.

   The image to the right is an example of when NO.01 is selected and NAME and MMSI is input. The image below that is an example of when AIS detection is ON.





   - The setting items are as follows.
     - STATE: VALID/INVALID *1
     - NAME: Maximum of 14 characters
     - MMSI: 9 digits *2
     - AIS: ON/OFF *3

   *1: The setting values for NAME, MMSI, and AIS are not displayed when INVALID is selected.

   *2: For coast station lists, "00" is inserted automatically at the beginning and the field is ready for the rest of the numbers to be entered. ("0" is inserted automatically at the beginning of group lists.)

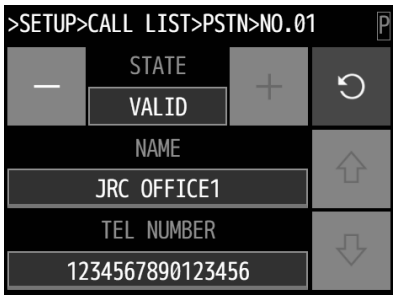
   *3: Turn this ON to activate detection (proximity check) of this wireless station via AIS.

   - If you are registering NAME and MMSI, touch the [Edit] button and input the values for each one. Use the [+]/[-] buttons if you are changing the STATE or turning the AIS to ON or OFF.

4. Finally, touch the [✓] button to register.

➢ Follow the same procedure above to create the radio station list.

Note
- The maximum registerable number is 80 for each of the coast station list, the ship station list, and the PSTN number list, and is 20 for the calling group list.
- Telephone numbers that can be registered to the telephone number list are between 1 and 16 digits. An example of the screen that is displayed during registration is shown below.

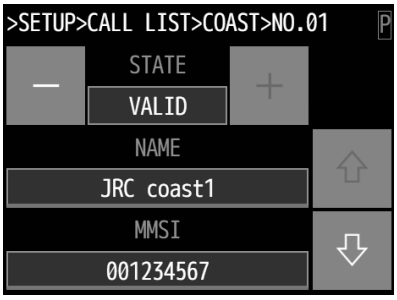


(2) Revising a list (Example: Coast station list)

■ Procedure ■

1. In step 2 above, select the number to change by touching the [LIST] button.

The example at right shows the case of the No.1 selected to revise the content.



2. If you want to change the NAME or the MMSI, touch the [Edit] button, do changes, and confirm using the [✓] button for each one. Use the [+]/[-] buttons if you are changing the STATE or turning the AIS to ON or OFF.

3. Finally, touch the [✓] button to register the change.

Note
- If you are deleting the details of a registered number, change the STATE to INVALID, touch the [✓] button, and then touch the [OK] button.
- If you are deleting all the details of a categorized list you have selected (coast station, ship station, group, or telephone), display ALL CLEAR that is shown at the bottom of the list, and touch the [ALL CLEAR] button. Then, touch the [OK] button.

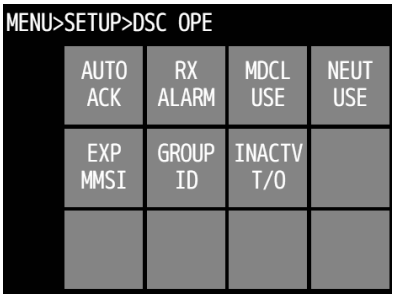
5.5 Advanced settings for DSC

The following describes the procedure for the advanced DSC settings such as automatic acknowledgement, as well as creating a PSTN number list.

■ Menu screen ■

In the main menu, touch the [SETUP] → [DSC OPE] buttons.

The following describes the procedures from this screen.



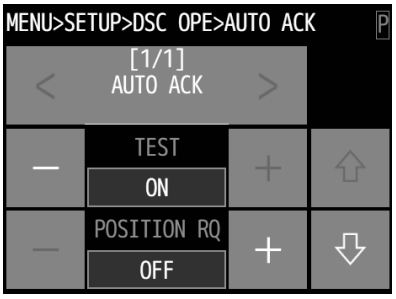
5.5.1 Automatic acknowledgement

If the DSC is set to automatic acknowledgement mode, and if there are no active transmissions, automatic acknowledgement can be done when the following DSC calls are received.

- Safety test call
- Safety position request call
- Routine polling call
- Individual call requesting communication without valid frequency (*)
  (*) In this case, the “unable to comply” acknowledgement is sent.

■ Procedure ■

1. When setting automatic acknowledgement, touch the [AUTO ACK] button.



2. Display the call you want to set with the [↑]/[↓] buttons, and then use the [+]/[-] buttons to turn it ON.

   ➢ The setting items are as follows.
   - TEST :ON/OFF
   - POSITION RQ :ON/OFF
   - POLLING :ON/OFF
   - INDIVUDUAL :ON/OFF

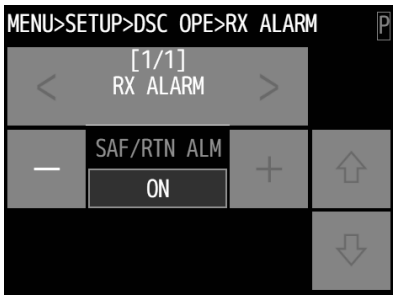
3. Finally, touch the [✓] button to register.

5.5.2 Disabling receiving alarms for routine and safety calls

The aural alarm for routine and safety calls can be disabled as follows. The factory setting is default “ON”

■ Procedure ■

1. Touch [RX ALARM] to disable the receiving of alarms.
2. Use the [+]/[-] buttons to turn it OFF.
3. Finally, confirm the changes with the [✓] button.



5.5.3 Disabling receiving alarms for routine and safety calls

The following describes the procedure to set the condition so that an urgency all ships call containing the additional subject of either "Medical transportation" or "Neutral nationality" can be sent. It is useful for the situation when sailing dangerous waters such as in areas of political instability, and needed to inform receivers of the additional information if any of the following apply.

- Own ship is performing medical transportation and protected under the 1949 Geneva Convention.
- Own ship is of neutral nationality in accordance with ITU resolution 18 (Mob-83).

Additionally, note that this setting returns to the default setting (OFF) if the power is turned off.

■ Procedure ■

Turn either MDCL USE (medical use) or NEUT USE (neutral use) to ON when making an urgency call.

- Medical use:[MENU]→[SETUP]→[DSC OPE]→[MDCL USE]
- Neutral use: [MENU]→[SETUP]→[DSC OPE]→[NEUT USE]

5.5.4 Expanded MMSI registration

⚠ CAUTION

Always set the expanded MMSI in the bridge of the vessel to zero (0). If setting to another value other than zero, DSC calls may not be received.

If there are multiple DSC devices having the same 9-digit MMSI on board a ship, setting the 10th digit of the MMSI number to a non-zero value is available to distinguish them in the case of routine individual calls.
The handling of 10-digit MMSI is as follows.

- When sending a routine individual call, the caller ID (own ship station's MMSI) is 10-digit MMSI.
- When receiving a routine individual call, the DSC having the identical address only treats the message, i.e. mainly the DSC having "0" as the 10th digit of MMSI receives an individual call addressed to the own station.
- When sending an acknowledgement to a received individual call, the address of the call is entered the caller's ID of the individual call as it is, i.e. if the 10th digit of the caller's ID is not "0", the address is 10-digit MMSI automatically.

■ Procedure ■

Change the setting values for EXP MMSI (expanded MMSI) when setting the 10th digit of the MMSI.

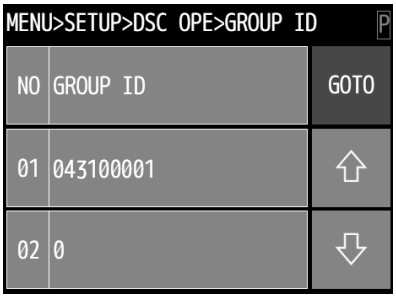
- Expanded MMSI: [MENU]→[SETUP]→[DSC OPE]→[EXP MMSI]

5.5.5 Registering the ship's group ID

Register the group ID (group ship ID number) for receiving group calls.

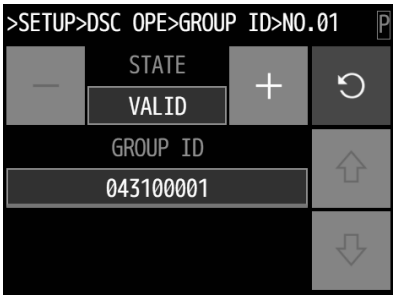
■ Procedure ■

1. Touch the [GROUP ID] button.



2. Using either the [↑]/[↓] buttons or the [GOTO] button, display the group ID to register or change, touch the [LIST] button, and then input the group ID (leftmost digit fixed to 0).

   - Up to 20 groups can be registered.
   - If you are disabling the details of a registered number, change the STATE to INVALID, touch the [✓] button, and then touch the [OK] button.
   - If you are deleting all of the registration, display ALL CLEAR that is shown at the bottom of the list, and touch the [ALL CLEAR] button. Then, touch the [OK] button.



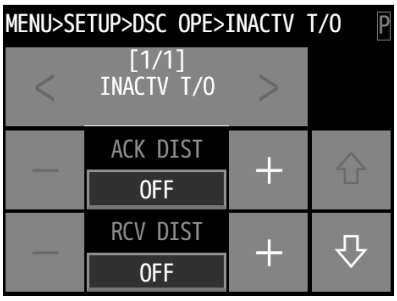
3. Finally, touch the [✓] button to register.

5.5.6 Setting the inactivity timer (for procedures on hold)

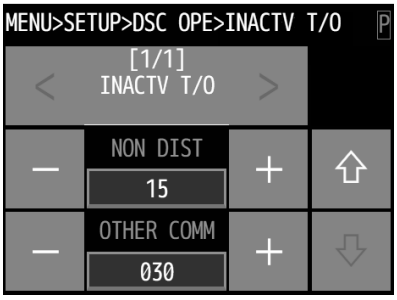
When making a procedure on hold, the procedure is automatically terminated after the time set as follows.

■ Procedure ■

1. Touch the [INACTV T/O] button.



2. Display the transmission category you want to set with the [↑]/[↓] buttons, and then make changes using either the [+]/[-] buttons or the [Edit] button.



- The setting items are as follows.

  ACK DIST: The acknowledged distress alert events sent from the own ship.
  (Setting range: 00 (OFF) to 60 minutes)

  RCV DIST: The distress events of other ships.
  (Setting range: 00 (OFF) to 60 minutes)

  NON DIST: Routine, safety and urgency events.
  (Setting range: 00 (OFF) to 60 minutes)

  OTHER COMM: Communications without using DSC.
  (Setting range: 010 to 600 seconds; this timer cannot be set to OFF.)

3. Finally, touch the [✓] button to register.

5.6 Other settings

The following describes the procedure to set the conditions regarding the AIS information import, the printer property, and preset squelch with respect to each channel.

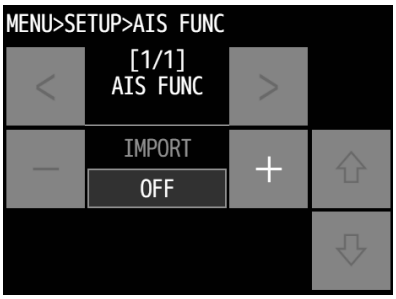
5.6.1 Enabling the AIS function

When connecting the AIS to use the information for such as a DSC call, set the import condition to ON as follows.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [AIS FUNC] buttons.

   Note The factory setting is default “ON”.



2. Turn the setting to ON using the [+]/[-] buttons.

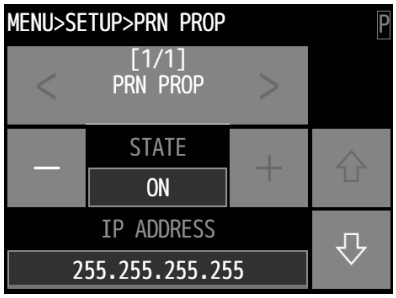
3. Finally, touch the [✓] button to register.

5.6.2 Setting printer properties

When connecting the printers, configure the conditions, as follows.

■ Procedure ■

1. In the main menu, touch the [SETUP] → [PRN PROP] buttons.



   - The setting items are as follows.

   STATE: Set the print function to ON or OFF.
   (Setting range: ON, OFF)

   IP ADDRESS: Set the printer's IP address.
   (Setting range: 000.000.000.000 to 255.255.255.255)

   PORT: Set the printer's port.
   (Setting range: 00000 to 65535)

   DATA OUT: Set the printing method for DSC messages.
   (Setting range: AUTO, MANUAL)

   DIRECTION: Set the direction to print text.
   (Setting range: INVERT, UPRIGHT)

2. Display the items to change with the [↑]/[↓] buttons, and then make changes using either the [+]/[-] buttons or the [Edit] button.

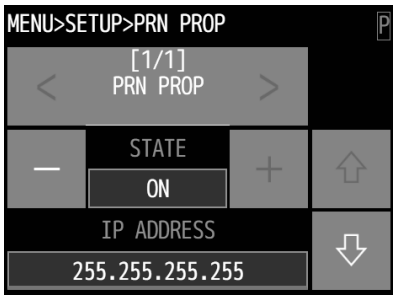
3. Finally, touch the [✓] button to register.

5.6.3 Setting the controller status when external power is turned on

When the external power supply is turned on to the main unit, set how to make the state of the controller. Set it to ON when turning on the controller power supply, and set it to OFF to set the controller power supply to the previous state. This function is only for the controller. The [INTERLOCK] button is not displayed on the main unit.

■ Procedure ■

1. In the main menu, touch the [SETUP] →[DISP SET]→ [INTERLOCK] buttons.



Note The factory setting is default “ON”.

2. Use the [+]/[-] buttons to select them.

3. Finally, touch the [✓] button to register.

6. MAINTENANCE & INSPECTION

The performance and lifetime of the equipment depend on the appropriate maintenance. This chapter describes the maintenance and inspection, self diagnosis, and outline of adjustment.

6.1 General maintenance & inspection

In order to operate the equipment under optimum conditions, it is vital to perform regular inspections and also, to keep accurate records. Inspections enable problems to be identified before they become major malfunctions.
The following inspections should be made regularly.

Inspection sequence	Inspection items	Procedure
1	Antenna system	Check that antennas and the connectors are secure.
2	Squelch operation	Turn the SQL control on the device with access right fully counterclockwise. Check for noise from the speaker. Check that the noise is suppressed by turning the SQL control clockwise.
3	Receiver condition checked by speaker output.	Check that the voice level and noise level are not abnormally loud or soft.
4	Handset PTT switch	Press PTT and check that the TX mark is displayed on the screen and the unit transmits immediately.
5	Transmission and reception checked by performing radio communication.	Check that normal conversation is possible.

6.2 Self diagnosis inspection

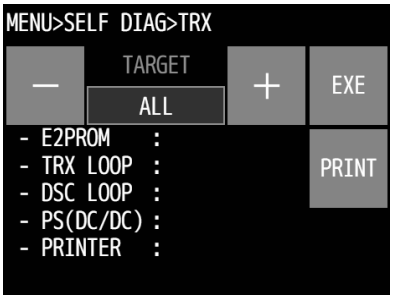
The following describes the procedure to perform inspections through self-diagnosis.

■ Procedure ■

1. In the main menu, touch the [SELF DIAG] button.

2. Select either the [TRX] and [DISP] buttons or the [DSC LOOP] button.

   - If you selected the [TRX] button, the screen at right is displayed.
   - The [DSC LOOP] button is a shortcut menu for selecting DSC LOOP on the screen at right.



3. Use the [+]/[-] buttons to select the test mode (TARGET), and then touch the [EXE] button to perform the self-diagnosis.

   The [EXE] button becomes the [CANCEL] button, and the test begins.

   The following test modes are available.

TRX:	ALL (all modes) MEMORY (E2PROM) TRX LOOP DSC LOOP PS (PS(DC/DC)) PRINTER
DISP:	ALL (all modes) MEMORY (E2PROM,EMMC,SDRAM) LCD SOUND

Note
- The only time you can select PRINTER in test mode is when the printer setup (MENU>SETUP>PRN PROP) is ON.
- To cancel the self-diagnosis once it has begun, touch the [CANCEL] button.
- The results of the self-diagnosis are saved as history. You can browse the latest 10 logs from MENU>SELF DIAG>TRX LOG or from MENU>SELF DIAG>DISP LOG.
- The self-diagnosis test contents and results are as shown below.

Menu	Test Item	Contents	Results
TRX	E2PROM	・E2PROM の書込・読出	OK : 正常 NG : 異常
	TRX LOOP	• Loop1 (TX-RX) loopback test • Loop2 (TX-WKR) loopback test	OK: Normal NG-LOOP1: LOOP1 error NG-LOOP2: LOOP2 error NG-LP1/LP2: LOOP1 & 2 error NG-TXVCO: TX VCO error NG-RXVCO: RX VCO error NG-WKRVCO: WKR VCO error NG-TRXVCO: VCO error of TX & RX NG-TX/WKRVCO: VCO error of TX & WKR NG-RX/WKRVCO: VCO error of RX & WKR NG-ALLVCO: All VCO error NG-LP2/RX: RX VCO & LOOP2 error NG-LP1/WKR: WKR VCO & LOOP1 error
	DSC LOOP	•DSC1 (TX-WKR) loopback test •DSC2 (WKR-RX) loopback test	OK: Normal NG-TX/WKR: DSC1 error NG-WKR/RX: DSC2 error NG-ALL: DSC1 & 2 error
	PS (DC/DC)	•DC/DC PWR output voltage check	OK: Normal NG: Error
	PRINTER	• Printout test for printer	- Only data output to the printer is done. Check the print results. - After output is complete, "DONE" appears.
DISP	E2PROM	• E2PROM read/write	OK: Normal NG: Error
	EMMC	• EMMC read/write	OK: Normal NG: Error
	SDRAM	• SDRAM read/write	OK: Normal NG: Error
	LCD	• Screen display test	- The fill display for all dots shows for 2 seconds each in the order of white → black → red → green → blue; this is done twice. Check for missing dots. - After the test is complete, "DONE" appears.
	SOUND	• Sound test	- Check aurally that a single tone sounds for 30 seconds.. - After the test is complete, "DONE" appears.

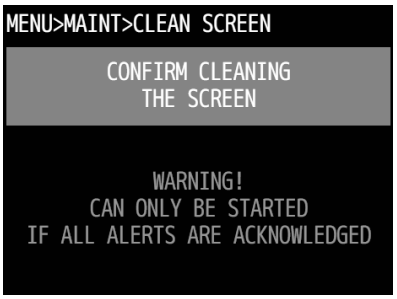
6.3 Cleaning the touch panel

The touch panel becomes unresponsive for 60 seconds, no matter what button you touch. Use this function when wiping the surface of the touch panel. However, the [DISTRESS] button and the [PWR] button are enabled.

■ Procedure ■

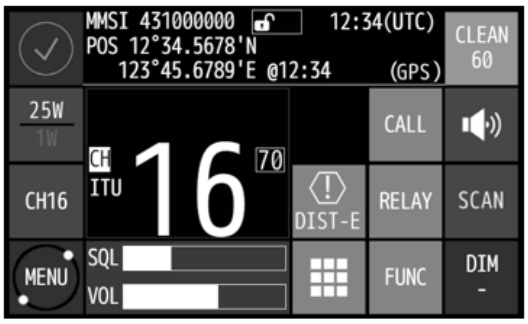
1. In the main menu, touch the [MAINT] → [CLEAN SCREEN] buttons.

   This can be started only after all alerts have been acknowledged.



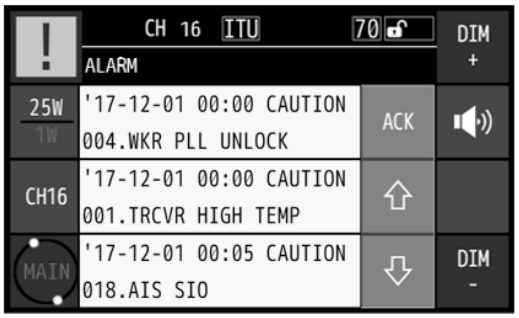
2. Touch the [CONFIRM CLEANING THE SCREEN] button.

   The regular screen appears, and the [DIM+] button in the upper right side changes to the CLEAN 60 display. The touch panel is unresponsive, no matter what button is touched, while it counts down from 60 to 01.
   After 60 seconds have passed, the regular screen appears.



6.4 System alarm indication

If errors regarding the equipment are detected, the screen immediately shows the alarm information as follows.

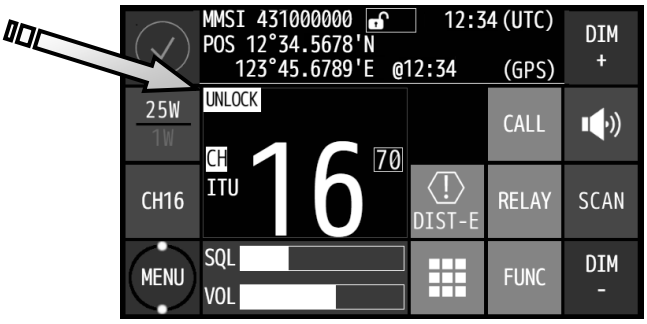


Note

- According to the alarm type, some features and functions may be automatically restricted.
  The alarm information is formatted as follows.

  [Alarm Date and Time], [Alarm Category]
  [Alarm Number], [Popup Information]

- Alarm categories are CAUTION only,.
- Scroll using the [↑]/[↓] buttons if there are more than 3 alarms.
- By touching the [ACK] button, the screen will be restored.
- When occurring 002.TRX PLL alarm, a blinking UNLOCK mark is additionally indicated. In this case, that mark is remained as shown below until restored to the normal condition.



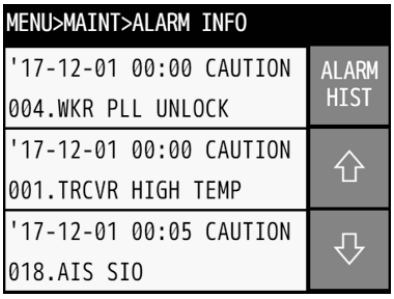
6.4.1 Alarm list

The following list shows the types of system alarm and contents.

Alarm Number	Display	Contents	Troubleshooting Procedure
001	TRCVR HIGH TEMP	Detected a temperature in the main unit that is higher than the specified values.	Stop transmission, or reduce the power to 1W
002	TRX PLL UNLOCK	Detected PLL Unlock in the transmitter or receiver.	*Please contact JRC or our agency.*
004	WKR PLL UNLOCK	Detected PLL Unlock in the CH70 watch keeping receiver.	*Please contact JRC or our agency.*
005	TRCVR MEMORY	Detected a memory error in the main unit.	*Please contact JRC or our agency.*
006	CTRL1 MEMORY	Detected a memory error in controller 1.	*Please contact JRC or our agency.*
007	CTRL2 MEMORY	Detected a memory error in controller 2.	*Please contact JRC or our agency.*
008	CTRL3 MEMORY	Detected a memory error in controller 3.	*Please contact JRC or our agency.*
009	CTRL4 MEMORY	Detected a memory error in controller 4.	*Please contact JRC or our agency.*
011	CTLR1 SIO	Detected a serial communication error in controller 1.	*Please contact JRC or our agency.*
012	CTRL2 SIO	Detected a serial communication error in controller 2.	*Please contact JRC or our agency.*
013	CTRL3 SIO	Detected a serial communication error in controller 3.	*Please contact JRC or our agency.*
014	CTRL4 SIO	Detected a serial communication error in controller 4.	*Please contact JRC or our agency.*
016	GPS SIO	Detected the GPS communication error.	*Please contact JRC or our agency.*
017	AIS SIO	Detected the AIS communication error.	*Please contact JRC or our agency.*
018	BAM SIO	Detected the BAM communication error.	*Please contact JRC or our agency.*
019	PRINTER	Detected an error in the printer.	Check the printer power or the LAN.
020	MMSI LOST	The MMSI has not been registered yet, or has been lost.	*Please contact JRC or our agency.*
021	OWN CTLR ID	Detected an ID error in the controller displaying this alarm.	*Please contact JRC or our agency.*
022	OWN CTLR SIO	Detected a communications error in the controller displaying this alarm.	*Please contact JRC or our agency.*
024	TRCVR PS (DC/DC)	Detected DC/DC power supply error.	*Please contact JRC or our agency.*
026	ABNORMAL RF POWER	Detected an error in the automatic power control (APC) or in a nearby circuit.	*Please contact JRC or our agency.*
027	POWER-OFF FAILURE	Detected malfunction regarding power supply control circuit in the main unit.	*The external power source, and then please contact JRC or our agency.*
028	DMC SIO	Detected the DMC communication error.	*Please contact JRC or our agency.*
029	MFD SIO	Detected the MFD communication error.	*Please contact JRC or our agency.*

6.4.2 Viewing the alarm history

You can check the history of alarms that occurred in the past.



■ Procedure ■

1. In the main menu, touch the [MAINT] → [ALARM INFO] buttons.

   If an alarm is occurring, the screen at right is displayed.

   If no current alarm, "NO DATA" is displayed.

   .

Note

- The displayed alarm information is formatted as follows..

  [Date and Time], [Alarm Category]
  [Alarm Number], [Popup Information]

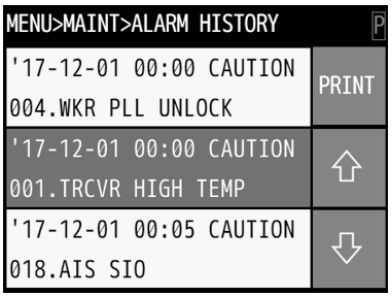
- Alarm categories are CAUTION only,.

2. If you are checking the history of alarms that occurred in the past, touch the [ALARM HIST] button here.

   A popup screen opens. Select [OK].

3. The alarm history is displayed.

   A maximum of 100 histories have been saved. Use the [↑]/[↓] buttons to scroll as needed.



Note

- The displayed alarm history is formatted as follows.
- .

  [Alarm and Recovery Date and Time], [Condition After Alarm]
  [Alarm Number], [Popup Information]

- Alarm categories are CAUTION, NORMAL(Recovery).

6.5 Checking the setup condition

The system information can be confirmed for use in maintenance and inspection.

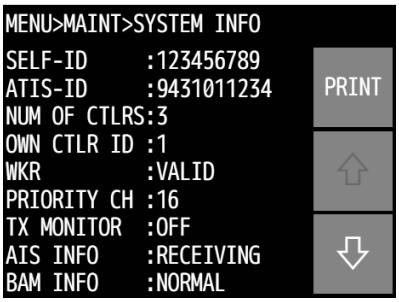
6.5.1 System information

The following describes the procedure to display such as the ID numbers or peripheral connection conditions.

■ Procedure ■

6. In the main menu, touch the [MAINT] → [SYSTEM INFO] buttons.

   Use the [↑]/[↓] buttons to scroll as needed.



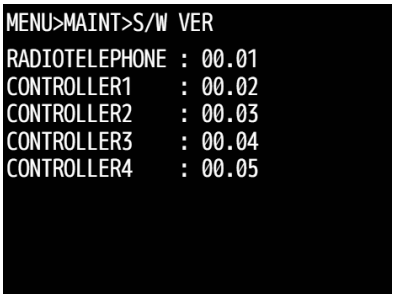
Note The confirmable information is described below.

Item Name	Contents	Notes
SELF-ID	Own ship's identification number (MMSI)	
ATIS-ID	The ATIS number for European inland waterways	
NUM OF CTLRS	The number of connected controllers	
OWN CTLR ID	The address number of this controller	
WKR	The setting status to use the watch-keeping receiver	Default setting: Valid
PRIORITY CH	The registered priority channel number	Default setting: CH16
TX MONITOR	The setting status to monitor communications of a controller at the other controllers and the external speaker	Default setting: ON
AIS INFO	The AIS connection status (RECEIVING/DISRUPTED/INVALID)	
BAM INFO	The BAM connection status (NORMAL/CS ERROR/INVALID)	
SYSTEM S/N	Device's serial number	
GROUP-ID xx	The identification number of the group own ship belongs to	xx: 01 - 20
PRN FUNC	ON/OFF settings for printer functions	Initial value: OFF
PRN PORT	Printer's port number	
UDP IP ADDR	Device's UDP IP address	
ETH IP ADDR	Device's IP address	
ETH MAC ADDR	Device's MAC address	
BT PAIRING	Names of devices paired with Bluetooth	
BT MAC ADDR	Bluetooth's MAC address	

6.5.2 Software version

In the main menu, touch the [MAINT] → [S/W VER] buttons to confirm the software version the equipment is running.

The software versions of the RADIOTELEPHONE (JHS-800S) and CONTROLLER (NCM-980) are displayed as shown at right.

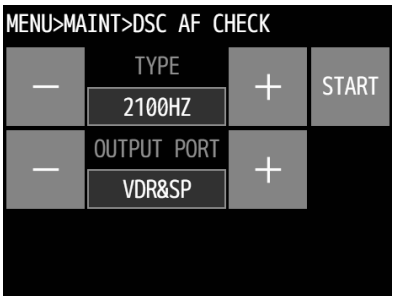


6.6 DSC AF inspection

DSC AF modulation frequencies can be checked for periodic inspections etc.

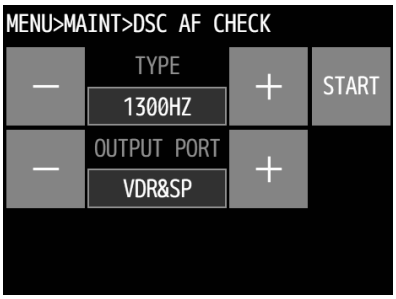
■ Procedure ■

1. In the main menu, touch the [MAINT] → [DSC AF CHECK] buttons.



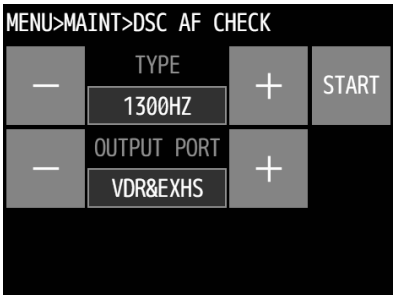
2. Using TYPE's [+]/[-] buttons, select the type of DSC modulated signal.

   The following types are selectable.
   - 2100 Hz: Space frequency (B)
   - 1300 Hz: Mark frequency (Y)
   - DOT: Dot pattern



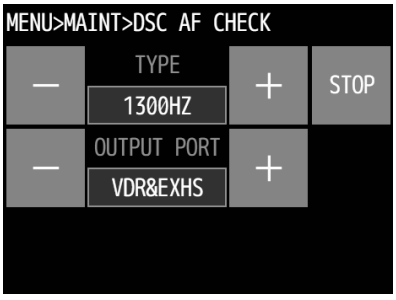
3. Using OUT PORT's [+]/[-] buttons, select the output destination for the DSC modulated signal.

   The following output ports are selectable.
   - VDR&SP: VDR output and internal speaker
   - VDR&EXHS: VDR output and external handset
   - VDR&EXSP: VDR output and external speaker terminal



4. Touch the [START] button to output a DSC modulated signal.

   The [START] button becomes a [STOP] button.
   To stop the signal, touch the [STOP] button.



6.7 Troubleshooting

⚠ WARNING

This unit is also used for the distress communication, in addition to usual communication. Contact JRC or our agent if any problem is observed in this unit on usual operation or inspection. Do NOT ignore or leave any problems of this unit.

Always use the specified fuse when replacing a fuse. Using a different fuse may result in fire or malfunction.

Do not open the equipment to inspect or repair it. Inspection or repairs by anyone other than a specialized technician may result in fire, electrical shock, or malfunction. If internal inspection or repair is necessary, contact our service center or agents.

6.7.1 Procedures for locating malfunctions

1) First, check the power supply voltage, fuses, and connectors.
2) If there are no problems with the above, use a tester to check for errors.

The following table shows the instruments required for effect repairs and the severity of the malfunctions.
If required to locate the malfunction, with the exception of qualified service personnel, perform the following No. 1 and 2 only.

No.	Type of Malfunction	Examples
1	Faults requiring no instrument to locate	• Blown power supply fuse • Faulty contacts • Broken antenna cables • Defective switches, volume, etc. • Other problems that can be visually detected
2	Malfunctions that can be fixed with a tester and repaired	• Power supply voltage confirmation • Breaks in internal wiring
3	Malfunctions requiring special instrument	• Crystal oscillator frequency error • Decrease in transmitting power and reception sensitivity • Decrease in transmitter modulation level • Malfunctions in semiconductors, ICs, and similar equipment

6.7.2 Guide to locating faults

Use the following table as a guide to locating the causes of malfunctions in the equipment.
Additionally when contacting JRC or our agency, please provide the malfunction condition.

No.	Symptom	Typical causes
1	Nothing appears on the screen.	• Abnormal power supply voltage • Main unit's power supply fuse is blown • Defective power supply switch, display circuit, or control circuit • Defective controller cable
2	TX is displayed but no voice is transmitted.	• Malfunction in the handset • Malfunction in the controller cable • Malfunction in the AF signal transmission circuit
3	TX is not displayed, and transmission is not possible.	• Malfunction in the handset PTT switch • Malfunction in the hook detection circuit • Malfunction in the transmission circuit
4	Reception sensitivity is poor.	• Antenna damage • Break or short circuit of antenna cable • Faulty contact in antenna connectors
5	No sound from the speaker even when squelch is opened without reception.	• Malfunction in the speaker • Defective SQL control circuit or harness • Malfunction in the receiver circuit
6	Noise is output from the speaker, but own ship cannot receive any calls.	• Antenna damage • Break or short circuit in antenna cable • Faulty contact in antenna connectors • Malfunction in the receiver
7	Turning SQL does not suppress noise.	• Malfunction in the SQL control • Malfunction in the receiver

Note The following are not faults.

Symptom	Possible causes	Handling
No response from other station via radiotelephone or DSC call.	No operator in that station, or unavailable to respond due to other duties.	Wait and retry later.
Can do PWR button operations and adjust the sound and brightness with the main unit or the controller, but cannot do operations with the radiotelephone.	Operations are limited due to no access right.	Press OPE to obtain the access right and after that, retry the operation.
Cannot obtain the access right even when pressing OPE on a main unit or controller with no access right when there are multiple controllers connected.	The main unit or another controller is in use for communicating or a controller with higher priority is performing menu operations.	After operations are complete on the main unit or other controller, do the operations to obtain the access right.
If the system is left on a screen other than the status display for a while, returns to the status display.	After leaving the specified period, the inactivity timer would be activated and returned to the status display.	Regulated specification by ITU-R M.493-13. (Do not leave the equipment during menu operation.)
The received distress call log have erased without operating.	Received distress calls are automatically deleted after 48 hours.	Regulated specification by IMO A.803(19).
Noise comes out of the portable radiotelephone when it comes close to a transceiver display or a controller.	This is due to the effect of the slight high frequency noise that is generated from the lighting circuit for the transceiver's LCD or the controller's LCD.	Either turn off the lighting for the controller screen, or keep the portable radiotelephone at least 1 m away.

6.7.3 Consumables

The following shows consumables. Please contact JRC or our agency to order parts.

Location	Description	Model (Part number)	Replacement guide
NKG-980 PRINTER	Printer paper	5ZPGF00001	Indicating red mark on the paper edge

6.7.4 Repair units/parts

The repair units and replacement part units are as follows.

● JHS-800S MARINE VHF RADIOTELEPHONE

Name	Unit/Part Name	Notes
CONTROL UNIT	CDJ-2800	
RF UNIT	CMN-2801	
POWER UNIT	CBD-2800	
POWER CABLE	CFS-810	
FUSE	0997015.WXN	For POWER CABLE(CFS-810)

● NCM-980 VHF CONTROLLER (optional)

Name	Unit/Part Name	Notes
CONTROL UNIT	CDJ-9800	
POWER UNIT	CBD-9800	
CAN CABLE	CFS-830	

● NBD-865 AC/DC POWER SUPPLY (Option)

Name	Unit/Part Name	Notes
FUSE	ATC-15 (manufactured by Bussmann)	32 VDC, 15 A INPUT FUSE

6.7.5 Regular replacement parts

The following shows the part to be replaced regularly. Please contact JRC or our agency to order it.

Part Name	Model Name	Replacement Period
Panel unit	CML-980	LCD backlight: Approx 20,000 to 30,000 hours of continued use at maximum brightness Touch panel: Approx 10 million times (2 times / second) of continued use (key stroke)

7. AFTER-SALES SERVICE

★ Warranty

The warranty period is determined by JRC's warranty regulations, but is normally 1 year from the date of purchase. Additionally, the warranty except for the body text is submitted to contractual agreements.

★ Repair Part Inventory Period

Parts necessary for proper functioning of this equipment will be kept available for 10 years after product discontinuation.

★ When Requesting Repairs

If you think there might be a malfunction, thoroughly read the items in "6.7 Troubleshooting" and check once again.

If the problem is due to a defect, immediately stop use of the system and contact the store at which you purchased the system, or one of our branches.

- During the warranty period, if a malfunction occurs with the equipment while in standard usage in accordance with this instruction manual, we or our agencies will repair the malfunction at no charge at the store where the equipment was purchased or another location specified by JRC. If the malfunction occurs due to improper usage, fault, or any external abnormal condition such as fire, pollution, abnormal voltage, natural disaster (ex. thunder storms, earthquake) etc., JRC will repair the equipment for a fee. Furthermore, regardless of the warranty period, orders of consumables will be charged.

- After the warranty expires, we will repair the malfunction for a fee, if repair is possible.

- Please inform us of the following :
  - ☆ Product name, model name, manufactured date, serial number
  - ☆ As much information as you can provide about the malfunction. (Alarm number, whether transmission is possible or not, etc.)
  - ☆ Your company or organization name, address, and phone number

★ Periodical Maintenance Recommendation

Depending on usage conditions, with extended use, the performance of this equipment may degrade over time, and externally installed parts such as the antenna may degrade due to vibration, so we recommend periodical maintenance in addition to the standard maintenance.

Please contact the store where you purchased the equipment, or one of our branches, to request periodical maintenance. Periodical maintenance requires a service charge.

If you have any questions regarding after-sales service, please contact the store where you purchased the equipment, or one of our branches.
Refer to the inside of the back cover for contact numbers and locations.

8. DISPOSAL

Observe all rules and regulations of the local authorities when disposing of this equipment.

9. SPECIFICATIONS

9.1 JHS-800S Marine VHF Radiotelephone

● General Specifications

Transmission frequency	Simplex/semi-duplex: 155.000 MHz - 163.500 MHz
Reception frequency	Simplex/semi-duplex: 155.000 MHz - 163.500 MHz
Number of channels	ITU/USA/Canada/IWW channels: Maximum 65 ch Weather channels: 10ch Private channels: Maximum 200ch Memory channels: Maximum 10ch
Channel spacing	25 kHz
Communication modes	Simplex and semi-duplex press talk system
Type of emission	Radiotelephone communications: F3E (G3E) DSC/ATIS: F2B (G2B)
Antenna impedance	50Ω unbalanced
Transmission/reception switching interval	300ms or less
Channel switching interval	5sec or less
Interface	IEC61162-1 Ed.4 (2010-11) (GPS/BAM/DIM) IEC61162-2 Ed1 (1998-09) (AIS/BAM/DIM)) IEC61162-450 Ed.1 (2011-06) (GPS/AIS/BAM/DIM/RMS/DMC) 600 Ω balanced (VDR) 600 Ω unbalanced (Ext SP)
Main controls	DSC call transmission (sending and receiving), communication channel settings, transmission power settings, squelch adjustment, volume adjustment, screen adjustment
Performance criteria	IMO A.803 (19), A.694 (17), MSC.68 (68), MSC/Circ.862 IEC 60945 Ed.4(2002-08)
Power supply voltage	24 VDC (19.2 VDC - 31.2 VCD)
Current consumption	25 W when transmitting Maximum 4.5A (DC24V) When receiving Maximum 1.5A (DC24V)
Operating temperature range	-25°C to +55°C
Storage temperature range	-40°C - +80°C
Humidity resistance	No abnormalities after left for 10 hours at +40°C, 93% RH
Vibration resistance (3 Axis)	2 Hz - 13.2 Hz amplitude ±1 mm, ±10% (Maximum acceleration of 7 m/s^2 at 13.2 Hz) 13.2 Hz - 100 Hz fixed maximum acceleration of 7 m/s^2 Vibration resistance test for over 2 hours at each resonance point Over 2 hours at 30 Hz when no resonance points
Continuous operation (Phone)	No abnormalities after operating continuously for 8 hours
Continuous operation (DSC, WKR)	No abnormalities after operating continuously for 24 hours
Category type of the weather resistance	Waterproofed handset connection box: Exposed Other units: Protected
Protection rating	IP56
Dimensions and mass	240mm (W) x 96mm (H) x 135.6mm (D) [excluding projections] Approx. 2.1 kg

● Transmitter

Antenna output power	6 W - 25 W (when reducing: 0.5 W - 1 W)
Deviation of antenna power	Within +20% and -50%
Oscillation method	Frequency synthesizer
Modulation method	Frequency modulation
Carrier frequency error	±1.5kHz or less
Maximum frequency deviation	±5kHz or less
Occupied bandwidth	16kHz or less
Pre-emphasis characteristics	6dB/oct within +1dB, -3dB
Overall distortion	10% or less
Adjacent channel power	-70 dB or 0.2 µW or less
Unwanted emissions in the out-of-band domain	3.125µW or less
Unwanted emissions in the spurious domain	3.125µW or less
Spurious emissions (EN300 338, EN301 925)	9 kHz - 1 GHz; 0.25 µW or less 1 GHz - 4GHz; 0.25 µW or less
Residual modulation	-40dB or less

● Receiver

Receiving system	Double superheterodyne
1st IF	58.05 MHz
2nd IF	450 kHz
Local oscillation frequency	Receiving frequency + 58.05 MHz
Local oscillation method	Frequency synthesizer
Frequency accuracy	±10 x 10^{-6} or less
Sensitivity (phone)	6dB µV or less (SINAD=20dB)
Sensitivity (DSC)	1% or lower symbol error rate at 0dB µV
Selectivity	6dB bandwidth: 12kHz or more, 70dB selectivity: 25kHz or less
Signal-to-Noise ratio	40dB or more
Audio output variance	3dB or less
De-emphasis characteristics	6dB/oct, within +1dB, -3dB
Co-channel selectivity	-10 - 0dB
Adjacent channel selectivity	70 dB or more
Desensitization effect (phone)	82 dBµV or more
Desensitization effect (DSC)	4.47 mV during interference input; 1% or lower character error rate
Spurious response (phone)	80 dB or more
Spurious response (DSC)	4.47 mV during interference input; 1% or lower character error rate
Intermodulation characteristics (phone)	74 dB
Intermodulation characteristics (DSC)	2.5 mV during interference input; 1% or lower character error rate
Blocking characteristics	90dBµV or more
Radiation	9 kHz - 1 GHz: 2 nW or less 1 GHz - 4 GHz: 20 nW or less
Squelch mute	-40dB or less
Squelch open level	+6dBµV or less
Overall distortion	10% or less

● CH70 Watch Keeping Receiver

Receiving frequency	156.525 MHz (CH70)
Receiving system	Double superheterodyne
1st IF	50.85 MHz
2nd IF	450 kHz
Local oscillation frequency	Receiving frequency + 50.85 MHz
Local oscillation method	Frequency synthesizer
Local oscillation frequency variance	±10 x 10^{-6} or less
Sensitivity	1% or lower symbol error rate at 0dB μV
Selectivity	6dB bandwidth: 12kHz or more, 70dB selectivity: 25kHz or less
De-emphasis characteristics	6dB/oct, within +1dB, -3dB
Co-channel selectivity	BER is less than 10-2 when -8 dB of interference is added
Adjacent channel selectivity	4.47 mV during interference input; 1% or lower character error rate
Desensitization effect	4.47 mV during interference input; 1% or lower character error rate
Spurious response	4.47 mV during interference input; 1% or lower character error rate
Intermodulation characteristics	2.5 mV during interference input; 1% or lower character error rate
Blocking characteristics	BER is less than 10-2 when 90 dB of interference is added
Radiation	9kHz - 2GHz: 2nW or less

● DSC/ATIS Modem

Modulation rate	600 Hz ±30 ppm
Modulation method	FSK
Modulation index	DSC: 2.0 ±10% or less ATIS: 1.0 ±10% or less:
Mark frequency (Y)	1300Hz ±10Hz or less
Space frequency (B)	2100Hz ±10Hz or less
DSC protocol	ITU-R Recommendation M.493-14 (Class A)
DSC operation standards	ITU-R Recommendation M.541-9, M.689-2, M.821-1, M.1080-0
ATIS protocol, operation standards	EN 300 698-1 V1.3.1

● Display control panel

Microphone input impedance	2.2kΩ balanced (NQW-980 use)
Standard modulation input	-40dBm
Audio output	Built-in speaker (4 Ω): 2.5W (5W @1kHz) Handset phone (150 Ω): 1 mW or more
LCD	5-inch TFT color, 800x480 pixels, LED backlight
Operation buttons	Touch panel, power button, DISTRESS button, volume control, SQL control

9.2 Channel assignment tables

(1) ITU Channels (ITU-RR Appendix18)

CH	TX (MHz)	RX (MHz)	Simplex	Semi-duplex	Notes
01	156.050	160.650		●	
02	156.100	160.700		●	
03	156.150	160.750		●	
04	156.200	160.800		●	
05	156.250	160.850		●	
06	156.300	156.300	●		For inter-ship communications
07	156.350	160.950		●	
08	156.400	156.400	●		For inter-ship communications
09	156.450	156.450	●		For inter-ship communications
10	156.500	156.500	●		For inter-ship communications
11	156.550	156.550	●		
12	156.600	156.600	●		
13	156.650	156.650	●		For inter-ship communications
14	156.700	156.700	●		
15	156.750	156.750	●		For inter-ship communications
16	156.800	156.800	●		Distress, Safety and Calling
17	156.850	156.850	●		For inter-ship communications
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		●	
27	157.350	161.950		●	
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		●	
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	●		For inter-ship communications
70	156.525	156.525	●		For DSC operation only
71	156.575	156.575	●		
72	156.625	156.625	●		For inter-ship communications
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	●		For inter-ship communications
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	●		

(2) USA Channels (FCC 47 CFR Part 80: 80.215, 80.371 and 80.373)

CH	TX (MHz)	RX (MHz)	Simplex	Semi-duplex	Notes
01A	156.050	156.050	●		
02					Unused
03					Unused
04					Unused
05A	156.250	156.250	●		
06	156.300	156.300	●		For inter-ship communications
07A	156.350	156.350	●		
08	156.400	156.400	●		For inter-ship communications
09	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 (momentary 25W)
14	156.700	156.700	●		
15		156.750			Transmission prohibited
16	156.800	156.800	●		Distress, Safety and Calling
17	156.850	156.850	●		
18A	156.900	156.900	●		
19A	156.950	156.950	●		
20	157.000	161.600		●	
20A	157.000	157.000	●		For inter-ship communications
21A	157.050	157.050	●		For USCG (General use prohibited)
22A	157.100	157.100	●		
23A	157.150	157.150	●		For USCG (General use prohibited)
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		●	
60					Unused
61					Unused
62					Unused
63A	156.175	156.175	●		
64					Unused
65A	156.275	156.275	●		
66A	156.325	156.325	●		
67	156.375	156.375	●		1W default (momentary 25W)
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	●		For inter-ship communications
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	●		For inter-ship communications, fixed at 1W
78A	156.925	156.925	●		
79A	156.975	156.975	●		
80A	157.025	157.025	●		
81A	157.075	157.075	●		General use prohibited
82A	157.125	157.125	●		General use prohibited
83A	157.175	157.175	●		For USCG (General use prohibited)
84	157.225	161.825		●	
85	157.275	161.875		●	
86	157.325	161.925		●	
87	157.375	161.975		●	
88	157.425	157.425	●		For inter-ship communications

Note The "Unused" channels listed above cannot be set while in the USA channel mode.

(3) Canada Channels (INDUSTRY CANADA RBR-2)

CH	TX (MHz)	RX (MHz)	Simplex	Semi-duplex	Notes
01	156.050	160.650		●	
02	156.100	160.700		●	
03	156.150	160.750		●	
04A	156.200	156.200	●		For CCG (General use prohibited)
05A	156.250	156.250	●		
06	156.300	156.300	●		
07A	156.350	156.350	●		
08	156.400	156.400	●		
09	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
18A	156.900	156.900	●		
19A	156.950	156.950	●		For CCG (General use prohibited)
20	157.000	161.600		●	Fixed at 1W
21A	157.050	157.050	●		For CCG (General use prohibited)
21B		161.650	●		
22A	157.100	157.100	●		General use prohibited
23	157.150	161.750		●	
23B		161.750	●		
24	157.200	161.800		●	
25	157.250	161.850		●	
25B		161.850	●		
26	157.300	161.900		●	
27	157.350	161.950		●	
28	157.400	162.000		●	
28B		162.000	●		
60	156.025	160.625		●	
61A	156.075	156.075	●		For CCG (General use prohibited)
62A	156.125	156.125	●		For CCG (General use prohibited)
63A	156.175	156.175	●		
64	156.225	160.825		●	
64A	156.225	156.225	●		
65A	156.275	156.275	●		
66A	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	●		
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	●		
78A	156.925	156.925	●		
79A	156.975	156.975	●		
80A	157.025	157.025	●		
81A	157.075	157.075	●		For CCG (General use prohibited)
82A	157.125	157.125	●		For CCG (General use prohibited)
83A	157.175	157.175	●		For CCG (General use prohibited)
83B		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	●		

(4) IWW Channels (ETSI EN 300 698-1 V1.4.1)

CH	TX (MHz)	RX (MHz)	Simplex	Semi-duplex	Notes
01	156.050	160.650		●	
02	156.100	160.700		●	
03	156.150	160.750		●	
04	156.200	160.800		●	
05	156.250	160.850		●	
06	156.300	156.300	●		For inter-ship communications, fixed at 1W
07	156.350	160.950		●	
08	156.400	156.400	●		For inter-ship communications, fixed at 1W
09	156.450	156.450	●		
10	156.500	156.500	●		Fixed at 1W
11	156.550	156.550	●		Fixed at 1W
12	156.600	156.600	●		Fixed at 1W
13	156.650	156.650	●		Fixed at 1W
14	156.700	156.700	●		Fixed at 1W
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		●	
27	157.350	161.950		●	
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		●	
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	●		Fixed at 1W
72	156.625	156.625	●		For inter-ship communications, fixed at 1W
73	156.675	156.675	●		
74	156.725	156.725	●		Fixed at 1W
75	156.775	156.775	●		Fixed at 1W
76	156.825	156.825	●		Fixed at 1W
77	156.875	156.875	●		For inter-ship communications, 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		●	
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	●		

(5) Weather Channels (FCC Rule 47CER80.371(c) and 80.373(f))

CH	RX (MHz)	Notes
WX1	162.550	NOAA weather channel
WX2	162.400	NOAA weather channel
WX3	162.475	NOAA weather channel
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
WX0	163.275	NOAA weather channel (Assigned only)

(6) Private Channels (For fishing or specially assigned channels)

CH	Simplex/Semi-duplex	Frequency (MHz)
P001 - P200	Common to both simplex and semi-duplex	155.0000 - 163.5000

Note

- Register the frequencies in 10kHz, 12.5kHz or 25kHz steps.
- If TX and RX frequencies are different, the equipment is in semi-duplex mode.
- Private channels are registered at the installation of the equipment. If desired to add the other private channels after installation, contact JRC or our agency.

9.3 Options

(1) VHF Controller (NCM-980)

Communication speed	250kbps
Communication interface	CAN
Microphone input impedance	2.2kΩ balanced (NQW-980 use)
Standard modulation input	-40dBm
Audio output	Built-in speaker (4 Ω): 6 W or more Handset phone (150 Ω): 1 mW or more
LCD	5-inch TFT color, 800x480 pixels, LED backlight
Operation buttons	Touch panel, power button, DISTRESS button, volume control, SQL control
Dimensions and mass	240mm(W) × 96mm(H) × 54.36mm(D) [excluding projections] Approx. 0.9 kg

(2) AC/DC power supply (NBD-965)

Source voltage	100VAC - 120VAC or 200VAC - 240VAC (50/60Hz) and 24VDC (21.6VDC - 31.2VDC)
Output voltage	24 VDC (19.2 VDC - 31.2 VDC)
Maximum output current	8.5 A
Source switching function	Automatic switching to DC power when AC power is cut off (uninterrupted output) Automatic switching from DC to AC when AC power is restored
Temperature range for full performance	-25°C - +60°C
Operating temperature	-25°C - +60°C
Storage temperature	-30°C - +70°C
Humidity resistance	95% at 40°C with no condensation
Vibration resistance (3 axes)	2 Hz - 15.8 Hz amplitude ±1 mm 15.8 Hz - 100 Hz, acceleration 1 G Endurance test for over 2 hours at each resonance point Over 2 hours at 30 Hz when no resonance points All 3 axes
Continuous operation	No abnormality after operating continuously for 8 hours

(3) Printer (NKG-980)

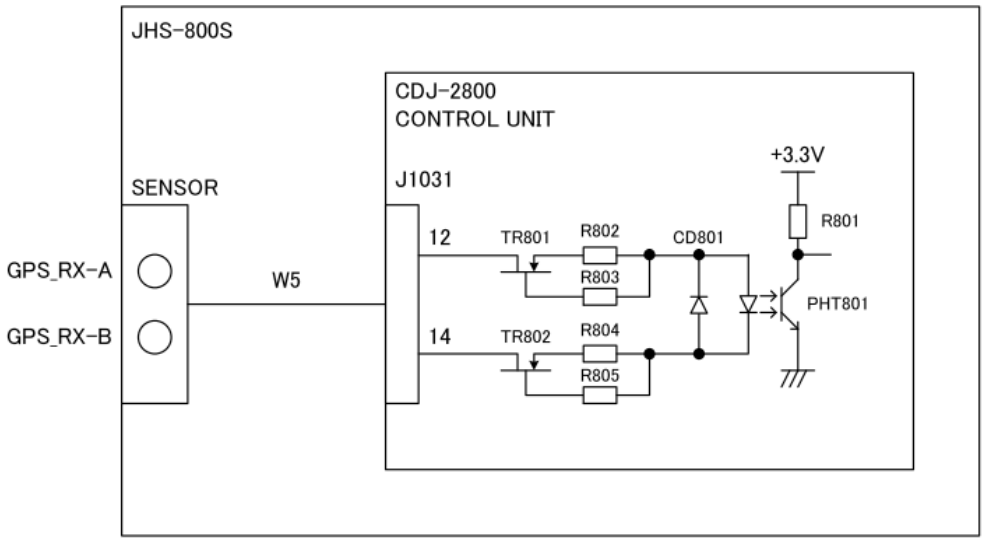
Printing system	Thermal line system
Communication interface	Ethernet, 10BASE-T/100BASE-TX
Maximum print speed	200 mm/sec or faster
Roll paper width	80 mm or 58 mm
Power voltage	22.8 V - 25.2 V (24 V ±5%)
Current consumption	Maximum 3.9A (DC 24V)

9.4 Peripheral interfaces

(1) GPS or other navigation aids interface

Serial	Interface standard	NMEA0183/IEC61162-1 Ed.4 (2010-11) compliant
	Protocol	4800bps, start 1bit, data 8bit, stop 1bit No parity
LAN	Interface standard Protocol	IEC61162-450 Ed.1 (2011-06) compliant
Input sentence		NMEA0183 V1.5: GGA/ GLL/ RMC V2.0: GGA/ GLL/ RMC/ ZDA V2.3: GGA/ GLL/ RMC/ GNS/ ZDA (Talker = "GP" or other)
Data type		Ship position & time information: GGA/ GNS/ GLL/ RMC Date information: ZDA/ RMC Equipment time information: ZDA/ GGA/ GNS/ GLL/ RMC

(1.1) Interface circuits (NMEA0183/IEC61162-1)



- Load requirements

  Current consumption: 2mA at 2V or less

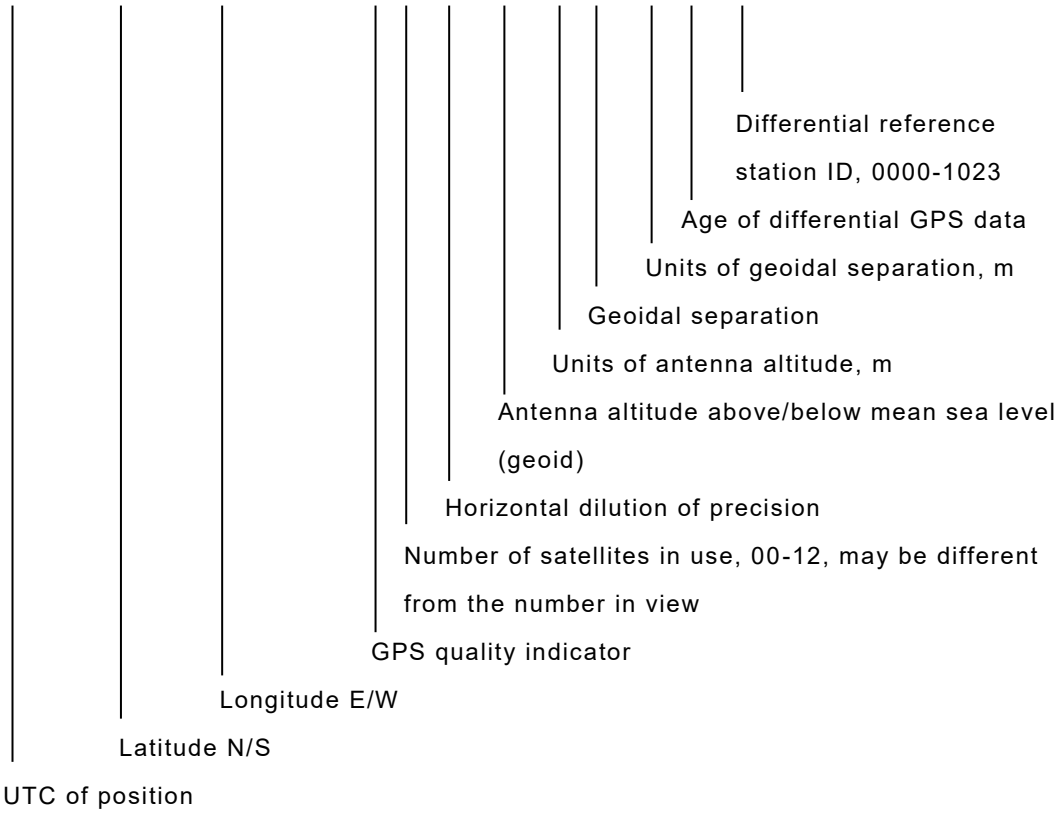
  Maximum input voltage: ±15V or more

  Recommended operating current: 2mA or more

(1.2) List of sentences and associated data fields

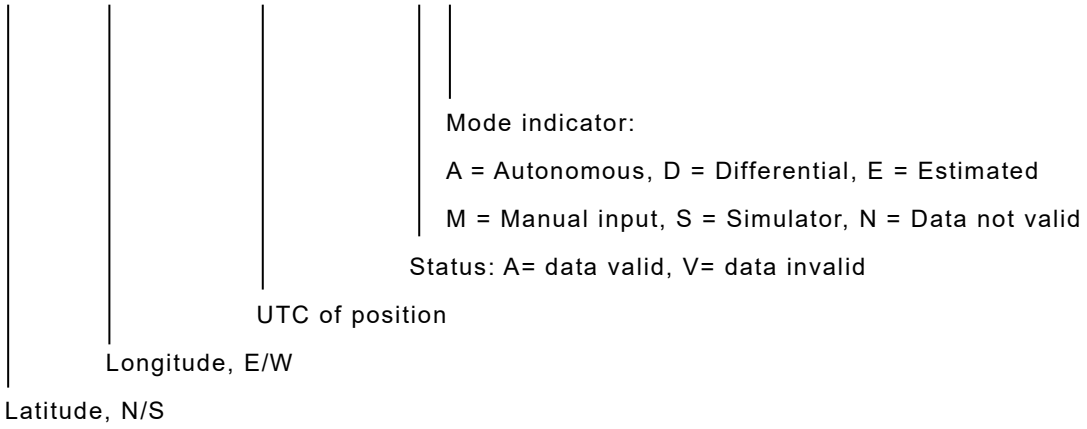
(1.2.1) GGA – Global positioning system (GPS) fix data

$--GGA, hhmmss, llll.ll, a, yyyyy.yy, a, x, xx, x.x, x.x, M, x.x, M, x.x, xxxx *hh<CR><LF>

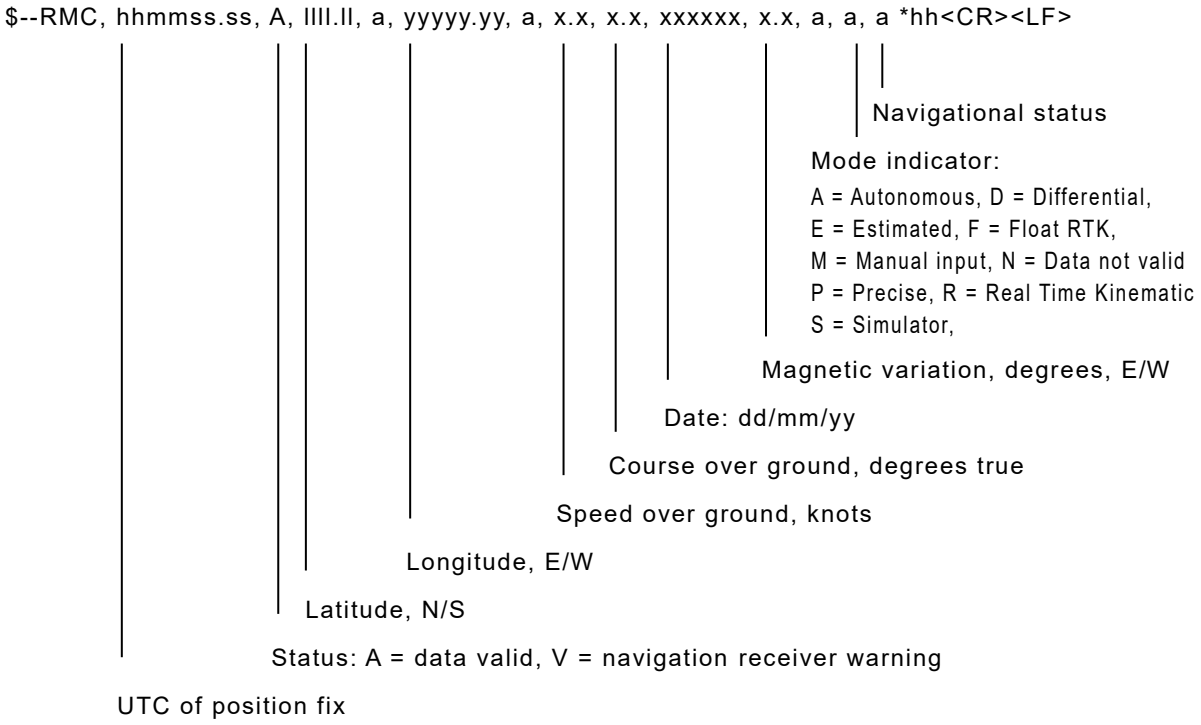


(1.2.2) GLL – Geographic position – Latitude/longitude

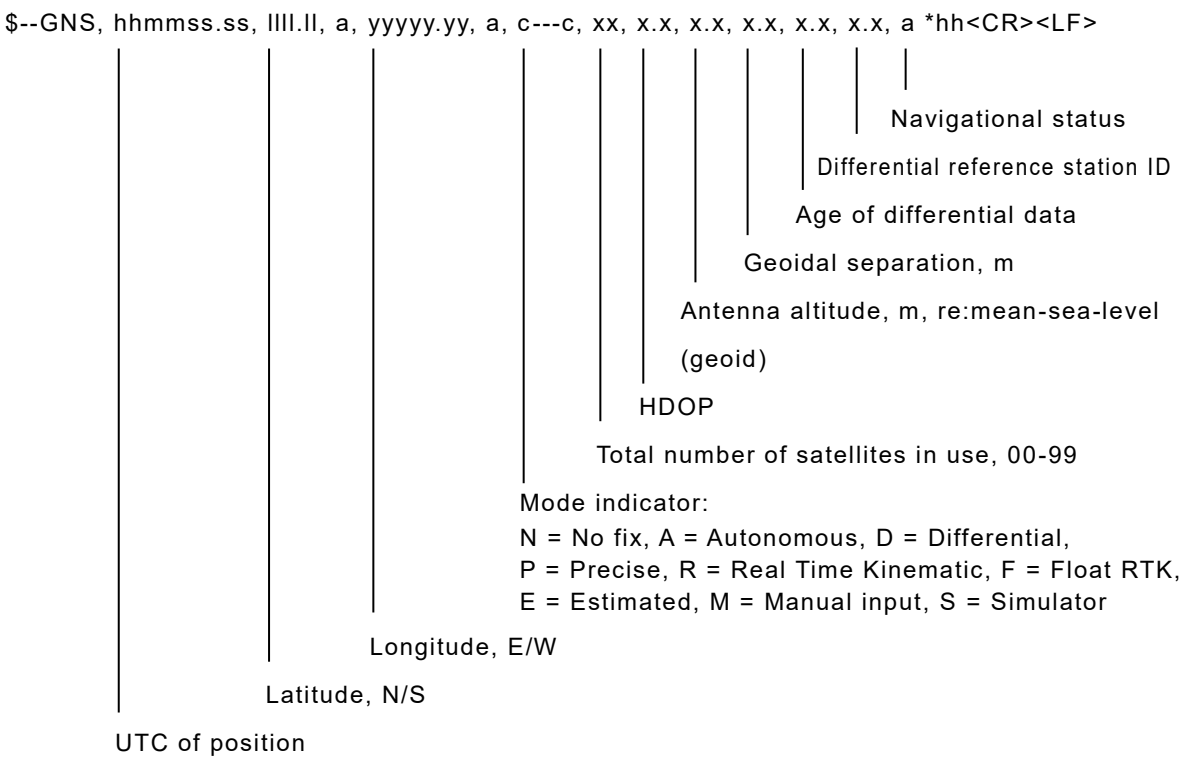
$--GLL, llll.ll, a, yyyyy.yy, a, hhmmss.ss, A, a *hh<CR><LF>



(1.2.3) RMC – Recommended minimum specific GNSS data

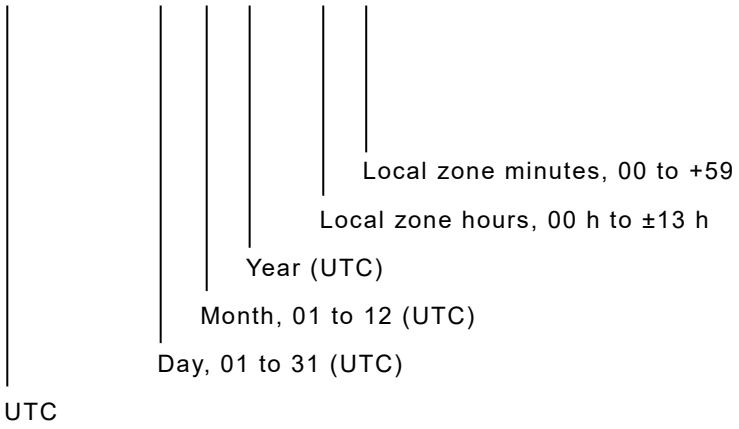


(1.2.4) GNS – GNSS fix data



(1.2.5) ZDA – Time and date

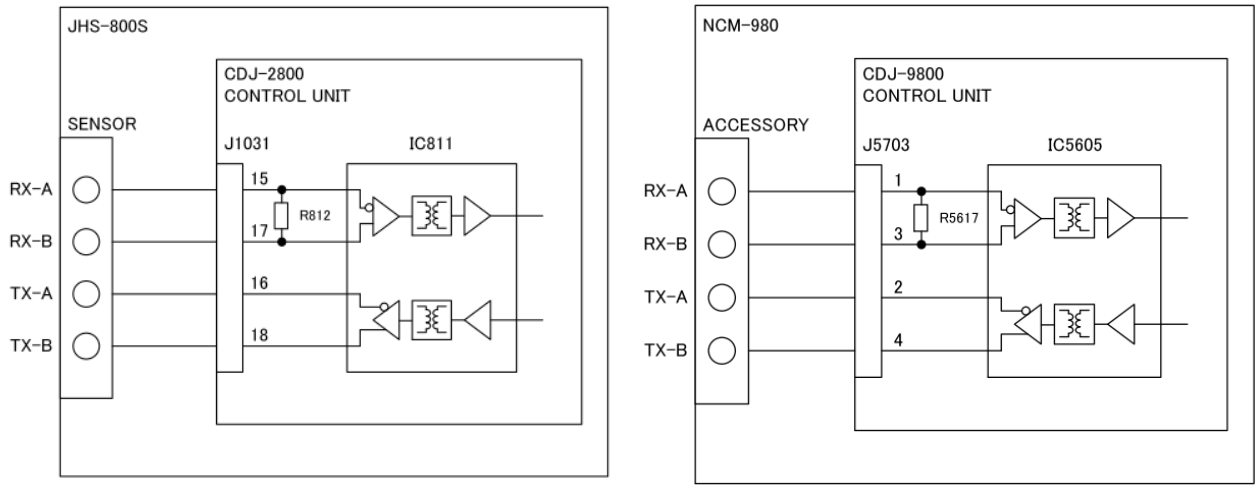
$--ZDA, hhmmss.ss, xx, xx, xxxx, xx, xx *hh<CR><LF>



(2) AIS interface

Serial	Interface standard	IEC61162-2 Ed.1 (1998-09) compliant
	Protocol	38.4kbps, start 1bit, data 8bit, stop 1bit No parity
LAN	Interface standard Protocol	IEC61162-450 Ed.1 (2011-06) compliant
Input sentence/message		VDM sentence: VDL1-5, 9, 18, 19 VDO sentence: VDL1-3, 18 ALR sentence: 003, 004, 026, 062, 065 (Talker = "AI" only)
Data type		Name and identification number of other ship Position information of other ship AIS type (Class A/B/Base station, SAR) Position data for own ship

(2.1) Interface circuits (IEC61162-2)



(NCM-980 peripheral devices are only DIM.)

- <RX>

  Input Current: ±70mA at ±7V

  Maximum differential input voltage: ±15V or more

- <TX>

  Maximum differential output voltage: ±3.6V

  Maximum output current: 200mA

(3) RMS interface

LAN	Interface standard Protocol	IEC61162-450 Ed.1 (2011-06) compliant
Output message		IEC61162-1 Ed.4 (2010-11) compliant proprietary sentence $PJRCL sentence (for RMS log saving) $PJRCM sentence (Device ID = "CV")
Data type		Device model name, serial number, self-diagnosis information, etc.

(4) BAM(MFD) interface

Serial	Interface standard	IEC61162-2 Ed.1 (1998-09) compliant
	Protocol	38.4kbps, start 1bit, data 8bit, stop 1bit No parity
LAN	Interface standard, Protocol	IEC61162-450 Ed.1 (2011-06) compliant
Input / Output sentence		ALC sentence (“Manufacturer mnemonic code” field is unused) (Interval is 20sec) ALF sentence (“Manufacturer mnemonic code” and “Escalation counter” fields are unused) ACN sentence (Only input) ARC sentence (“Manufacturer mnemonic code” field is unused) HBT sentence (Interval is 10sec) (Talker = "BN" or other, Device ID = "CV")
Data type		Alert state of a device

(5) DIM interface

Serial	Interface standard	IEC61162-2 Ed.1 (1998-09) compliant
	Protocol	38.4kbps, start 1bit, data 8bit, stop 1bit No parity
LAN	Interface standard, Protocol	IEC61162-450 Ed.1 (2011-06) compliant
Input / Output sentence		DDC sentence (Talker = "NL" or other, Device ID = "CV")
Data type		Equipment display brightness

10. OPTIONS OPERATION

10.1 Controller (NCM-980)

The controller has almost the same functions as the main unit's display and control panel. Any differences are described together in the explanation of the main unit. The main differences are as described below.

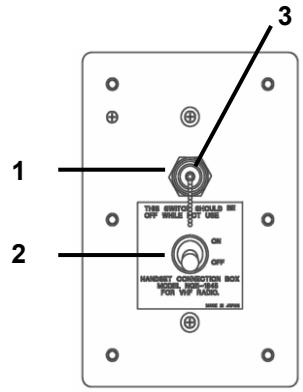
- Printing cannot be done from the controller. (Refer to "4.1 Operation overview".)
- There are no settings for external handsets. (Refer to "5.3.2 Sound settings" and "5.3.6 Setting the handset".)
- When selecting the [TRX] button with the self-diagnosis function, self-diagnosis of the connected main unit is performed. (Refer to "6.2 Self diagnosis inspection".)
- "5.6.3 Setting the controller status when turning on the external power" is only for the controller.

10.2 Handset connection box (NQE-1845/1846/1847B)

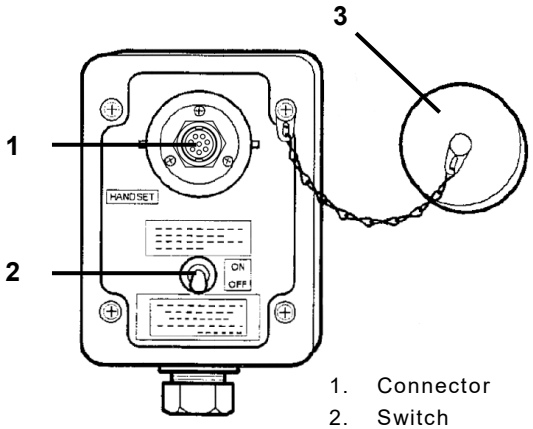
There are three types of handset connection boxes: a waterproof flush mount type for a wing console (NQE-1845), a waterproof wing installation type (NQE-1846) and an indoor flush mount type (NQE-1847B).

⚠ CAUTION

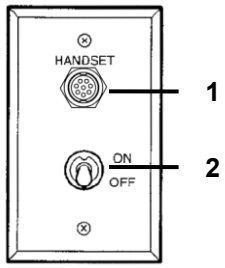
Close the water-resistant cap of the waterproof type handset box after use. Rain and sea breeze could cause connector malfunction. Also do not leave the handset above deck.



Waterproofed flush mount type for wing console (NQE-1845)



Waterproofed wing installation type (NQE-1846)



Indoor flush mount type (NQE-1847B)

1. Connector
2. Switch
3. Waterproof cap

■ Procedure ■

1. In the case of the waterproof type, remove the water-resistant cap.
2. Connect the handset (NQW-980) to the connector.
3. Turn ON the switch to start communications.

   The access right is obtained by turning on this switch.

   (This switch is equivalent to hook switch of the handset.)

Note
- Always turn off the switch when not in use.
- Even if the switch is turned on, while another controller with higher priority is in use, the access right will not be obtained.

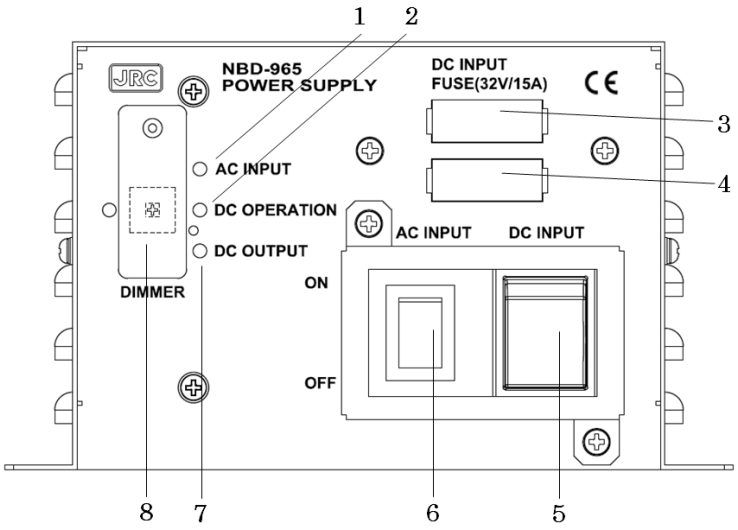
10.3 AC/DC power supply (NBD-965)

⚠ WARNING

Before replacing fuses of this unit, always turn off this AC/DC power switch and power source output to this unit.

Always use the specified fuse when replacing a fuse. Using a different fuse may result in fire or malfunction.

In addition to the DC fuse on the panel, there are also AC fuses inside the device. You should never replace the AC fuses because working inside the devices may result in fire or electric shock.
If an AC fuse blows, request repairs from JRC or our agency.



1. AC INPUT lamp
2. DC OPERATION lamp
3. DC fuse (+)
4. DC fuse (-)
5. DC switch
6. AC switch
7. DC OUTPUT lamp
8. Dimmer control

■ Procedure ■

1. Turn on both of the AC and DC switches.

If there is no AC power connected, only turn on the DC power switch.

2. Confirm that the DC OUTPUT lamp is lit.

If this lamp is lit, 24VDC power is being output properly.

Note

- If the switch is turned on but the DC OUTPUT lamp does not light, except for the dimmer control position, there may be a malfunction with the AC/DC input power voltage, or a fuse may have been blown.
- If only DC power is used, the DC OPERATION lamp will light. Be careful not to over discharge the battery.
- Use by inserting the breaker into the power supply line from the battery.
- Because you are stopping the power supply from the battery, cut the breaker that is inserted into the power supply line when stopping the engine for long periods of time, such as during long-term anchorage.

10.4 Printer (NKG-980)

⚠ CAUTION

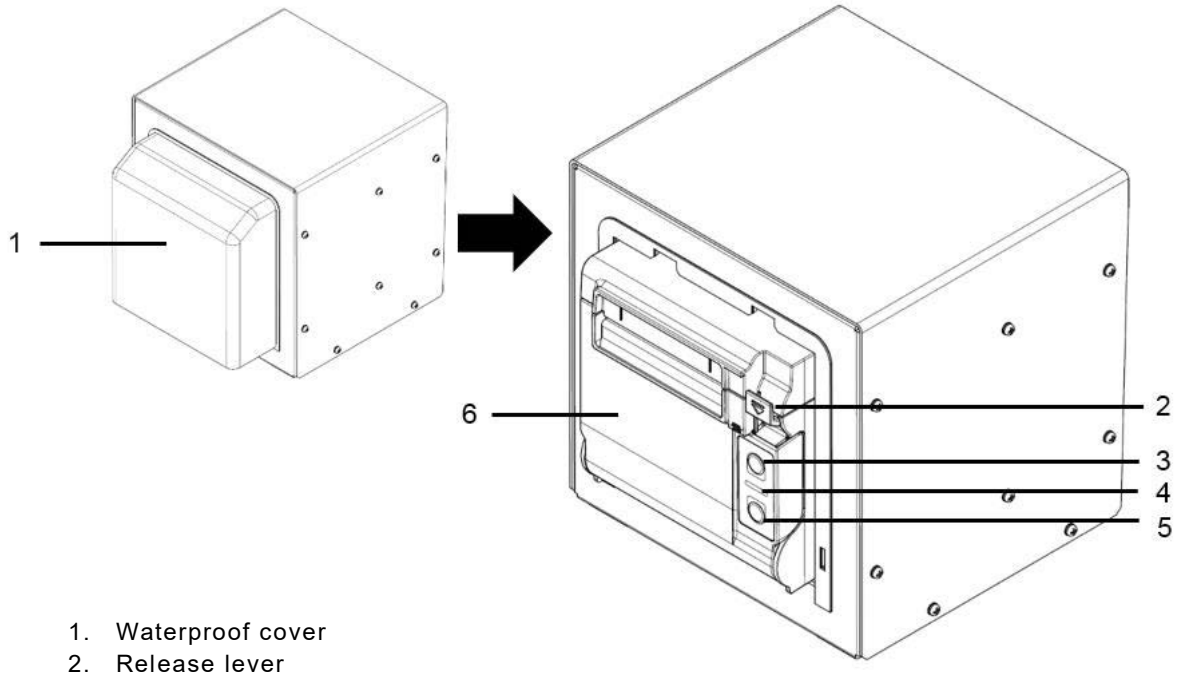
The thermal head of the printer may be very hot after printing. Do not touch it. Perform paper replacement and head cleaning only after waiting for the head to completely cool.

Do not put your finger etc. because there is a cutter blade at the paper discharge port. Also, do not touch the blade of the cutter when opening the paper cover.

The printing paper used in this printer is a heat sensitive paper. Take the following precautions when using this paper.

- Store the paper away from heat, humidity, or heat sources.
- Do not rub the paper with any hard objects.
- Do not place the paper near organic solvents.
- Do not allow the paper to come in contact with polyvinyl chloride film, erasers, or adhesive tape for long periods of time.
- Keep away the paper from freshly copied diazo type or wet process copy paper.

State with waterproof cover



1. Waterproof cover
2. Release lever
3. Feed button
4. Alarm lamp
5. Power button
6. Paper cover

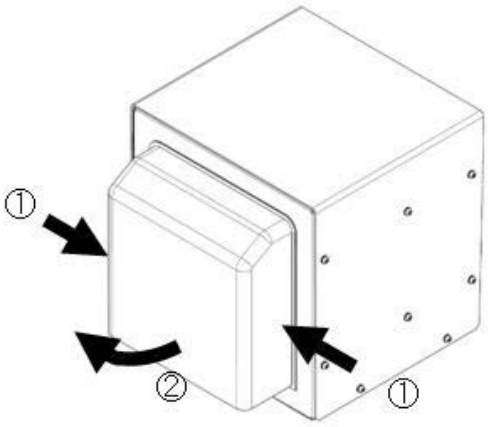
■ Removing the waterproof cover ■

1. **Press the side of the waterproof cover (arrow part) inward.**

   The paper cover will open.

2. **Lift the lower end of the waterproof cover forward and remove it.**

   .



■ Turning the power on / off ■

1. **Pull the release lever toward you.**

   Press and hold the power button.

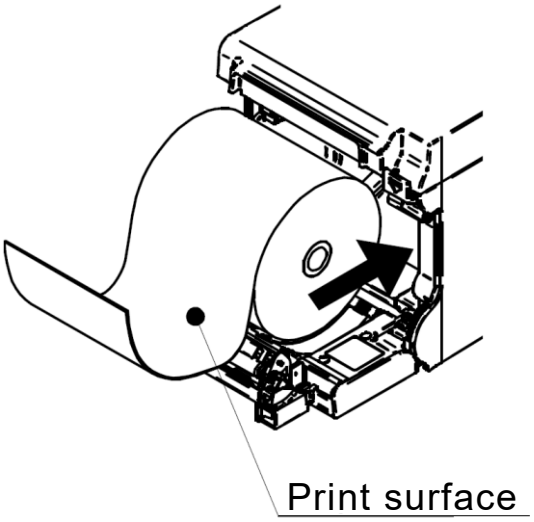
■ Loading the printer paper ■

1. **Pull the release lever toward you.**

   The paper cover will open.

2. **Insert the paper as shown at right.**

   Position the paper such that the edge extends outside the printer, and press the both sides of the paper cover to close it. When the paper cover is closed, paper feed and cutting of the leading edge of the paper are done automatically.



JUNE 2018 Edition 1