

FURUNO

OPERATOR'S MANUAL

VHF RADIOTELEPHONE

MODEL **FM-8900S**

ECF

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

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• FURUNO Authorized Distributor/Dealer

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IMPORTANT NOTICES

General

- This manual has been authored with simplified grammar, to meet the needs of international users.
- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty.
- All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

How to discard this product

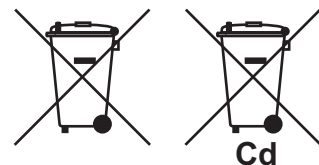
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (<http://www.eiae.org/>) for the correct method of disposal.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. Follow the instructions below if a battery is used. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.



In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.



SAFETY INSTRUCTIONS

The user must read the appropriate safety instructions before attempting to install or operate the equipment.



WARNING

Indicates a condition that can cause death or serious injury if not avoided.



CAUTION

Indicates a condition that can cause minor or moderate injury if not avoided.



Warning, Caution



Prohibitive Action



Mandatory Action



WARNING



Do not open the equipment.

Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment. Only qualified personnel should work inside the equipment.



Do not approach the antenna closer than listed below when it is transmitting.

The antenna emits radio waves that can be harmful to the human body.

RF power density on antenna aperture	Distance	Description required by
100 W/m ²	0.12 m	IEC 60945
10 W/m ²	0.39 m	IEC 60945
2 W/m ²	0.89 m	MPE by FCC

(MPE: Minimum Permissible Exposure)



Immediately turn off the power at the switchboard if water leaks into the equipment or the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.



Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.



Do not place liquid-filled containers on the top of the equipment.

Fire or electrical shock can result if a liquid spills into the equipment.



WARNING



Do not operate the equipment with wet hands.

Electrical shock can result.



Turn off the power immediately if you feel the equipment is behaving abnormally.

Turn off the power at the switchboard if the equipment becomes abnormally warm or is emitting odd noises. Contact a FURUNO dealer or agent for advice.



Make sure no rain or water splash leaks into the equipment.

Fire or electrical shock can result if water leaks in the equipment.



Use the proper fuse.

Use of the wrong fuse can cause fire or electrical shock.





Any repair work must be done by a licensed radio technician.




Improper repair work can cause fire or electrical shock.



Do not operate the [DISTRESS] key except in case of a life-endangering situation on your vessel.

Operating the [DISTRESS] key transmits the distress alert. Accidental transmission may prevent search and rescue operations for actual emergency. If the distress alert is accidentally transmitted, contact the nearest station to cancel the alert.

 CAUTION
<p> If the distress alert is accidentally transmitted, contact the nearest coast station and inform them of the accidental transmission, providing the following data:</p> <p>a) Ship's name b) Ship's call sign and DSC number c) Position at time of transmission d) Time of transmission</p>

 CAUTION
<p> Do not touch any part of the antenna when the equipment is transmitting.</p> <p>Electrical shock can result.</p>
<p> Do not apply strong pressure to the LCD, which is made of glass.</p> <p>Injury can result if the LCD breaks.</p>

WARNING LABELS

Warning labels are attached to the equipment. Do not remove any label. If a label is missing or damaged, contact a FURUNO agent or dealer about replacement.

 WARNING 
To avoid electrical shock, do not remove cover. No user-serviceable parts inside.
 警告 
感電の恐れあり。 サービスマン以外の方はカバーを開けないで下さい。内部には高電圧部分が多くあり、万ざさわると危険です。

Name: Warning Label 1
Type: 86-003-1011-3
Code No.: 100-236-233-10

	 DANGER
	Electrical shock hazard. Do not touch parts inside this cover.
	 危険
	感電の恐れあり。 カバーの内部には、絶対に触れないで下さい。

Name: Warning Label
Type: 14-055-4202-1
Code No.: 100-245-221-10



Name: High Temp Warning Label
Type: 05-089-2142-0
Code No.: 100-301-620-00

About the TFT LCD

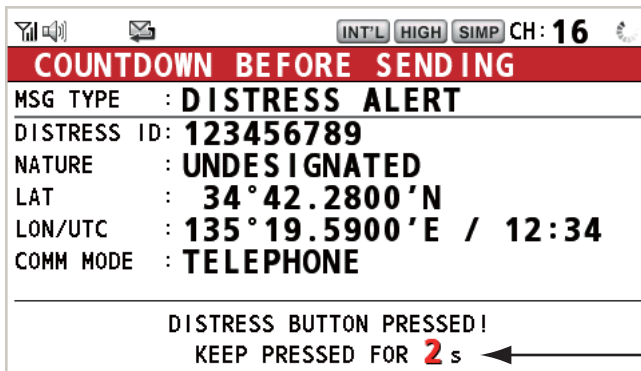
The TFT LCD is constructed using the latest LCD techniques, and displays 99.99% of its pixels. The remaining 0.01% of the pixels may drop out or blink, however this is not an indication of malfunction.

DISTRESS ALERT

How to send a distress alert

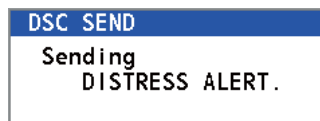
Below is the procedure for transmitting a distress alert via radiotelephone. Transmit the distress alert when a life-endangering situation occurs on your vessel.

1. Open the **DISTRESS** key cover then press and hold the **DISTRESS** key for four seconds. The following screen appears.

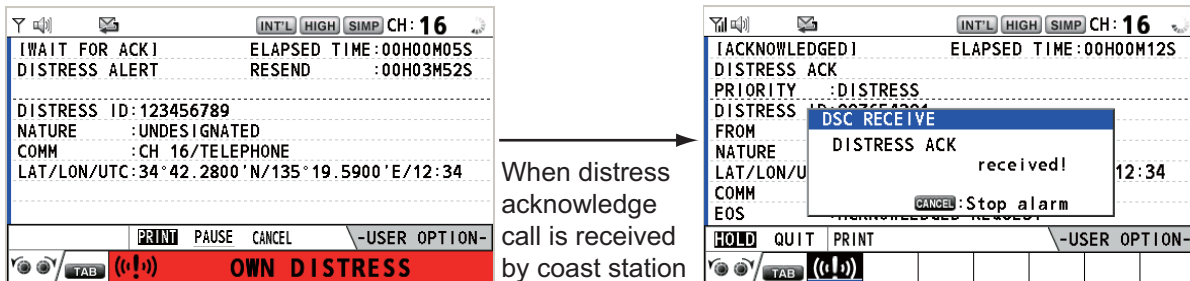


Countdown message

2. When the message "Sending DISTRESS ALERT." appears on the screen, release the **DISTRESS** key. The audio alarm sounds for two seconds.



After the distress alert has been sent, the following screens appear in order.



When distress acknowledge call is received by coast station

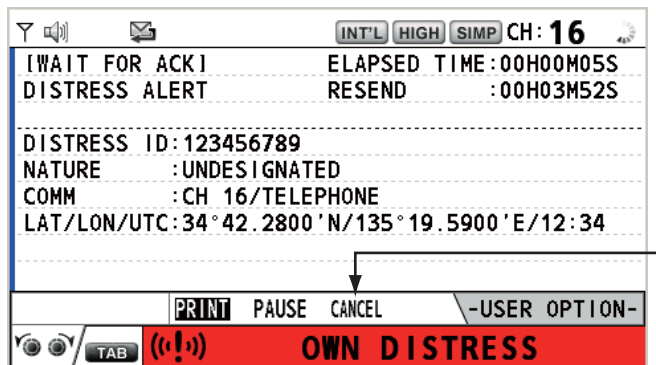
3. The audio alarm sounds. Press the **CANCEL** key to silence the audio alarm.
4. Communicate with the coast station via radiotelephone (CH16) as below.
 - a) Say "MAYDAY" three times.
 - b) Say "This is ..." name of your ship and call sign three times.
 - c) Give nature of distress and assistance needed.
 - d) Give description of your ship (type, color, number of persons onboard, etc.).

Note: If you do not receive the distress alert acknowledge call, the equipment automatically re-transmits the distress alert after 3 min 30 seconds to 4 min 30 seconds. Then the equipment awaits the distress alert acknowledge call. This is repeated until the distress alert is acknowledged.

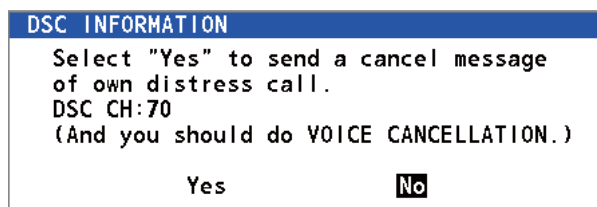
How to cancel the distress alert

You can cancel the distress alert while it is being sent or while waiting for its acknowledgement as follows.

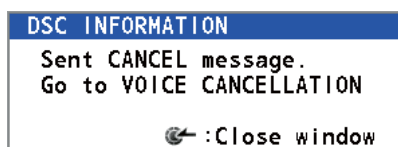
1. Rotate the **CHANNEL/ENTER** knob to select [CANCEL] in the user options area then push the knob.



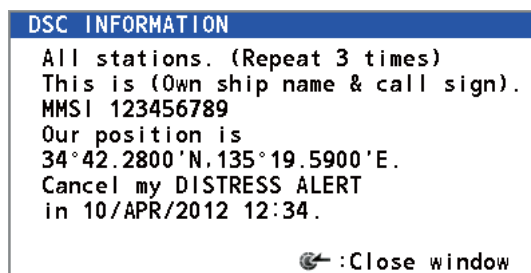
The following message appears on the screen.



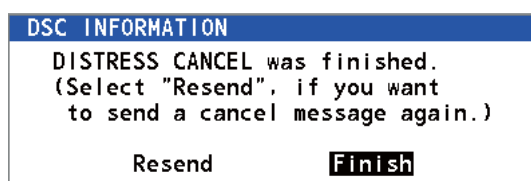
2. Rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob to send the distress cancel call on CH70. After transmitting the distress cancel call, the following message appears on the screen.



3. Push the **CHANNEL/ENTER** knob to erase the message. The following message appears on the screen.



4. Communicate with all ships via radiotelephone referring to the message at step 3.
5. Push the **CHANNEL/ENTER** knob. The following message appears on the screen.



6. With [Finish] selected, push the **CHANNEL/ENTER** knob.

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FOREWORD

A Word to the Owner of the FM-8900S

Congratulations on your choice of the FURUNO FM-8900S VHF Radiotelephone. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

Since 1948, FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

Your equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained. Please carefully read and follow the operation and maintenance procedures set forth in this manual.

We would appreciate feedback from you, the end-user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO equipment.

Features

The FM-8900S is a cost-effective all-in-one marine VHF radio system consisting of a 25 W VHF radiotelephone, a DSC modem, and a CH70 watchkeeping receiver. It complies with GMDSS carriage requirements for safety and general communications.

The FM-8900S offers semi-duplex voice communication on ITU channels in the marine mobile VHF band. The features include Scanning Dual Channels (DW) which allows a continuous watch on CH16 and another selected frequency.

Data is displayed on a large, easy-to-read color LCD. Operation is simplified by the use of few keys and easy-to-follow menus.

The built-in DSC function produces and receives digital selective callings for quick and efficient establishment of distress, urgency, safety and routine communications with other ships and coast stations that install any VHF DSC facilities.

Full Class-A DSC functions are provided for distress alert transmission and reception, as well as the general call formats (Individual telephone, All Ships, and Group call). Distress alert can be readily transmitted but an arrangement is provided to prevent accidental activation. The FM-8900S maintains a continuous watch on CH70 even while another VHF channel is in use. Aural and visual alarms are given to incoming DSC messages.

The main features are

General

- Fully meets the following regulations: EN 300 698-1, EN 301 925, ITU-R M.493-13, ITU-R M.541-9, ITU-R M.689-2, EN 300 338-1, EN 300 338-2.
- Automatic entry of position with manual override
- Optional printer can automatically print out DSC received messages and test results.

FOREWORD

DSC

- Distress, urgency, safety and routine calling
- File editing capability for readiness in case of emergency
- PSTN (Public Switched Telephone Network) capability standard
- Log stores 50 each of latest general, distress and transmitted messages, in separate memory blocks.
- Selectable an address from the AIS targets list with connection of FURUNO AIS Transponder/ Receiver

VHF

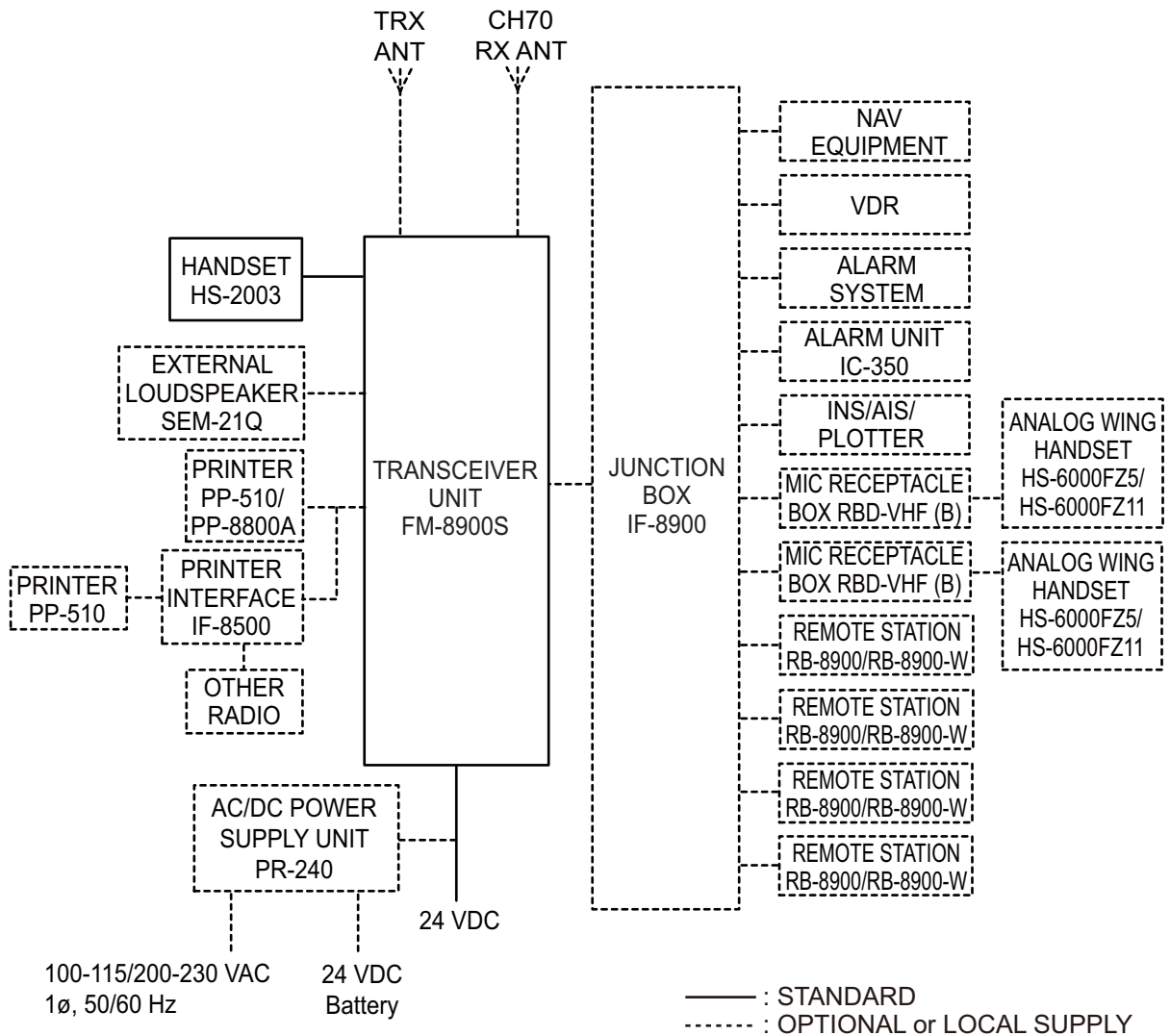
- Voice communication
- Scanning of channels on VHF
- Simplified setting of channel
- Replay of the latest receiving voice, which is automatically recorded, for 120 seconds
- Max. 4 remote stations (RB-8900) can be connected (not available for DSC function).

Program Number

Location	PC board	Program No.	Version
FM-8900S	MAIN (05P0843)	0550249	01.xx
HS-8900	HS CONT (05P0781B)	0550250	01.xx

xx: minor change

SYSTEM CONFIGURATION



Environmental category

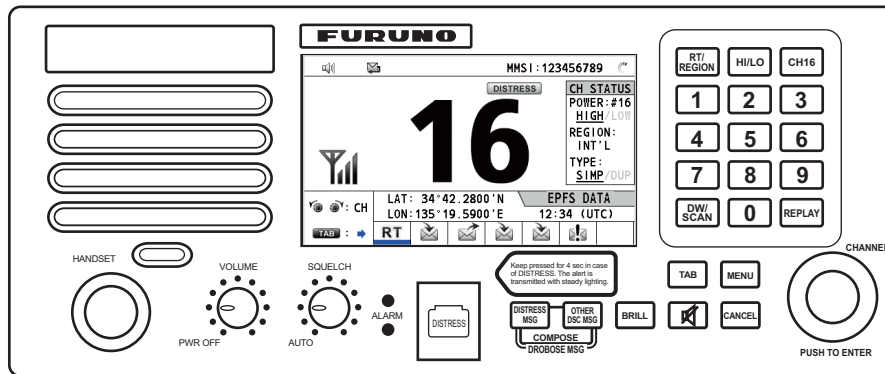
Antenna units: Exposed to the weather

All other units: Protected from the weather

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1. OPERATIONAL OVERVIEW

1.1 Controls



Transceiver unit

Description of controls for transceiver unit

Control	Function
VOLUME/PWR knob	<ul style="list-style-type: none"> Turns the power on or off. Adjusts the volume.
CHANNEL/ENTER knob	<ul style="list-style-type: none"> Rotate to select channel. Rotate to select menu items or change the page in multi-page screens (e.g., log data); push to confirm a selection.
SQUELCH knob	Rotate to adjust the squelch. The squelch mutes the audio output in the absence of an incoming signal. AUTO position automatically reduces white noise.
DISTRESS key	Press and hold down the key four seconds to transmit the distress alert.
DISTRESS MSG key	Composes DSC TX message for DISTRESS ALERT.
OTHER DSC MSG key	Composes DSC TX message except DISTRESS ALERT and DROBOSE (Distress Relay On Behalf Of Someone Else).
DROBOSE MSG key	Composes DSC TX message for DROBOSE (Distress Relay On Behalf Of Someone Else). Press the DISTRESS MSG key and the OTHER DSC MSG key simultaneously.
BRILL key	Adjusts the brilliance.
TAB key	<ul style="list-style-type: none"> Switches control to the tab area. Switches the session.
🔊 key	Turns the main speaker on or off.
MENU key	Opens/closes the menu.
CANCEL key	<ul style="list-style-type: none"> Cancels the creation of the DSC message currently being created. Silences the audio alarm. Erases error message and pop-up message. Returns previous layer in multi-layer menu. Erases character input.
RT/REGION key	<ul style="list-style-type: none"> Switches to the RT (radiotelephone) screen. Opens/closes the option window for channel region.
HI/LO key	Changes the output power to high (25 W) or low (1 W).
CH16 key	Switches to the RT (radiotelephone) screen and sets CH16.

1. OPERATIONAL OVERVIEW

Control	Function
0 to 9 keys	<ul style="list-style-type: none"> Enter alphabet, numeric or symbol. Direct selection of corresponding function on menu and applicable screens.
DW/SCAN key	<ul style="list-style-type: none"> Opens the option window for DW or SCAN. Cancels DW or SCAN in process.
REPLAY key	Opens the replay screen.
ALARM lamps	<p>Top: Flashes in red when receiving distress alert, distress and urgency messages.</p> <p>Bottom: Flashes in green when receiving safety and routine messages, and when daily test is completed.</p> <p>The flashing of a lamp for receiving a DSC message is in synch with the audio alarm.</p> <p>The flashing cycle for both top and bottom lamps is 200 msec (lighting) → 200 msec (off) → 200 msec (lighting) → 200 msec (off) → ...</p>

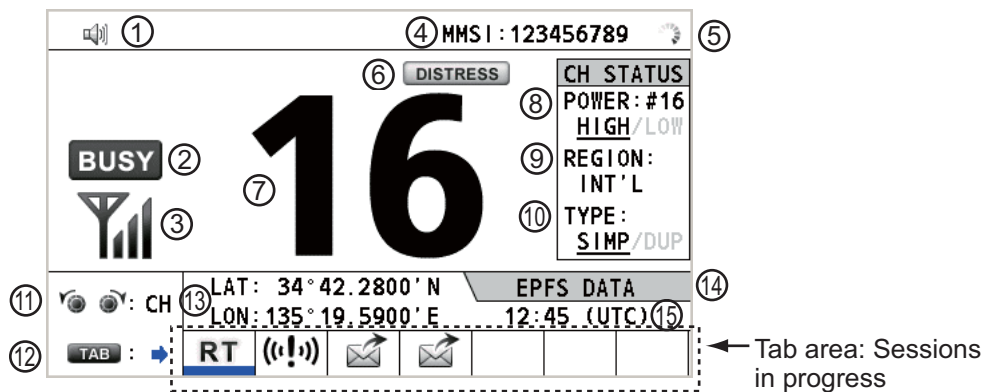
1.2 How to Turn On/Off the Power

Rotate the **VOLUME/PWR** knob clockwise to turn on the power. The RT screen appears.

To turn off the power, rotate the **VOLUME/PWR** knob counterclockwise to the OFF position.

1.3 Radiotelephone (RT) Screen

Turn the power on, or press the **RT/REGION** key to show the radiotelephone (RT) screen. This is where you set up the transceiver unit, and communicate by voice.



Radiotelephone (RT) screen on the transceiver unit

No.	Meaning
1	Loudspeaker on (🔊) or off (🔇)
2	This icon appears when the channel is busy.
3	Intensity of reception (This icon does not appear while transmitting.)
4	Own ship's MMSI (nine digits)
5	Spinner rotates when the equipment is functioning normally.
6	This icon appears when the frequency is for distress.
7	Channel
8	Output power ([HIGH], [LOW])
9	Channel region ([INT'L], [USA], [CANADA], [INLAND-W], [PRIVATE])

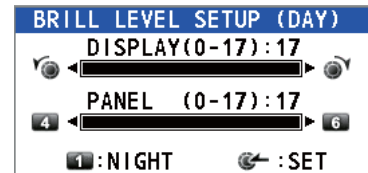
No.	Meaning
10	Channel type ([SIMP]: Simplex, [DUP]: Duplex)
11	Guidance: Rotate the CHANNEL/ENTER knob to select channel.
12	Guidance: Press the TAB key to switch the session.
13	Own ship's position (LAT: Latitude, LON: Longitude)
14	Method of data input [EPFS DATA]: The position and time data from EPFS. [EPFS (OFFLINE)]: Indicates no position data from EPFS for ten minutes. [EPFS (OLD)]: Indicates no position data from EPFS for four hours. [MANUAL INPUT]: Set the position and time data manually. [NO INFO]: No position and time data.
15	Time (UTC: universal time coordinated) of the position fix

1.4 How to Adjust the Brilliance of the Display and Panel

You can adjust the brilliance of the display and the panel for transceiver unit.

1. Press the **BRILL** key to show the [BRILL LEVEL SETUP] window.
If necessary, press the **1** key to switch the [DAY/NIGHT] mode.

Note: When switching the [DAY/NIGHT] mode with the **1** key, the [BRILL LEVEL SETUP] window closes. Press the **BRILL** key again to show the window.



2. To adjust the [DISPLAY] brilliance, rotate the **CHANNEL/ENTER** knob or press the **BRILL** key. (Default setting: 17 for [DAY], 7 for [NIGHT])
3. To adjust the [PANEL] brilliance, press the **4** (decrease the setting) or **6** (increase the setting) key. (Default setting: 17 for [DAY], 12 for [NIGHT])
4. Push the **CHANNEL/ENTER** knob to save the settings and close the window. To cancel the settings, press the **CANCEL** key instead of the **CHANNEL/ENTER** knob to close the window.

Note 1: The equipment keeps values for [DAY] and [NIGHT] separately.

Note 2: The window closes automatically when there is no operation for four seconds.

Note 3: When you turn on the power with the display brilliance set to 0, the setting automatically changes to 1.

1.5 How to Select the Channel Region, Channel

Channel region

You can select the channel region by the **RT/REGION** key or the [REGION] menu.

By the RT/REGION key

1. Press the **RT/REGION** key to open the [REGION] option on the RT screen.
2. Rotate the **CHANNEL/ENTER** knob to select the channel region desired then push the knob.



1. OPERATIONAL OVERVIEW

By the [REGION] menu

See paragraph 5.3.1.

1. Press the **MENU** key to open the [MENU] screen.
2. Rotate the **CHANNEL/ENTER** knob to select [CH MODE] then push the knob.
3. Rotate the **CHANNEL/ENTER** knob to select [REGION] then push the knob.
4. Rotate the **CHANNEL/ENTER** knob to select the channel region desired then push the knob.



Only permitted channel regions are displayed, which are set by the installer of the equipment.

The following options are available.

- [INT'L]: International mode
- [USA]: USA mode
- [CANADA]: CANADA mode
- [INLAND-W]: Inland waterway mode
- [PRIVATE]: Private channel mode

Note: Private channels are available only where permitted by the authorities. The [USA], [CANADA], [INLAND-W], [PRIVATE] can also be set by a qualified service technician.

Channel

The channel can be set manually on the RT screen. Enter the channel by one of the methods below.

Enter channel with the **CHANNEL/ENTER** knob:

Rotate the **CHANNEL/ENTER** knob on the RT screen.

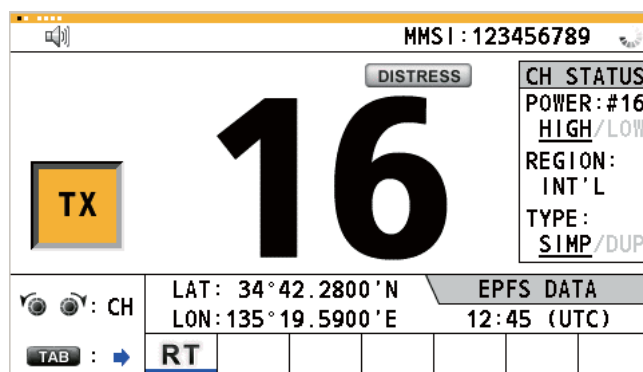
Enter channel with the numeric keys:

Use the numeric keys to enter channel on the RT screen then push the **CHANNEL/ENTER** knob. The setting is automatically confirmed two seconds after entering, without pushing the **CHANNEL/ENTER** knob.

1.6 Transmission

How to transmit

Press the **PTT** (push-to-talk) switch on the handset with off hook to talk, and release it to listen for a response. "TX" appears on the screen during transmission.




How to change the output power

Press the **HI/LO** key to change the output power between high and low alternately. [HIGH] or [LOW] with underline appears in the [CH STATUS] area on the RT screen depending on your selection.

1.7 How to Turn On/Off the Loudspeaker

You can turn the loudspeaker (other than DSC communication, error, and key beep) on or off.

1. Press the  key to alternately disable or enable the loudspeaker.



2. To adjust the volume of the loudspeaker, rotate the **VOLUME/PWR** knob (cw: volume up, ccw: volume down).

1.8 Quick Selection of CH16

Press the **CH16** key to select CH16. The CH16 (156.8 MHz) is the international frequency for distress traffic and for calling by radiotelephone. The CH16 can also be used by ship stations for call and reply. To facilitate the reception of distress calls and distress traffic, all transmissions on CH16 should be kept to a minimum and should not exceed one minute. Before transmitting on the CH16, a station should listen on this frequency for a reasonable period to make sure that no distress traffic is being sent.

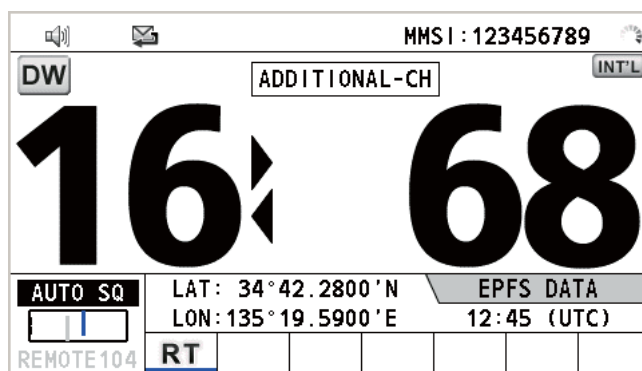
1.9 How to Scan Dual Channels (DW)

The DW function permits watch on CH16 and an operator-selected channel. CH16 and another channel are watched at intervals of 0.15 seconds and one second, respectively.

1. Select the other channel to watch then press the **DW/SCAN** key to show the [DW/SCAN] option.



2. With [DW] selected, push the **CHANNEL/ENTER** knob. The following screen appears (channel 68 is selected in the example).



1. OPERATIONAL OVERVIEW

When the receiver detects a carrier and the squelch opens, the following occurs.

- When the squelch opens on the additional channel, the receiver continues scanning dual channels.
- When the squelch opens on the CH16, the CH16 is set.

When the squelch closes, the scanning on dual channels restarts.

To stop the scanning on dual channels, do one of the following:

- Press the **CANCEL** key.
- Press the **CH16** key.
- Press the **DISTRESS** key.
- Press the **DW/SCAN** key.
- Off hook a handset if there is one on hook.
- Press the **PTT** switch of a handset that is off hook. In this case, press the **PTT** switch again to transmit.
- Activate another session.
- Select [HOLD] in the RT session.
- Select [QUIT] in the RT session.
- Press the **MENU** key.
- Press the **RT/REGION** key.

1.10 How to Scan All Channels

The receiver scans all channels at intervals of 0.15 seconds in the selected channel mode in ascending channel order, watching CH16 between channels as below:

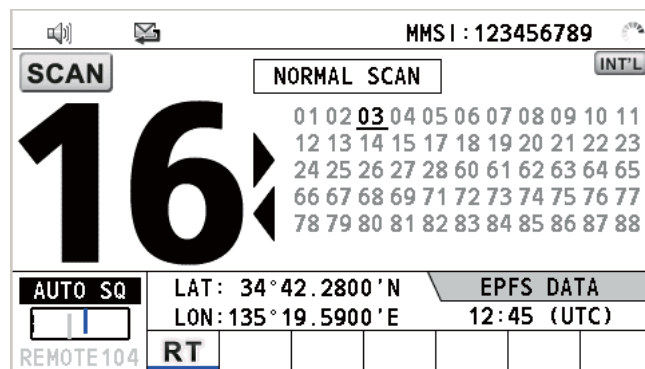
```
01 → 16 → 02 → 16 → 03 → 16 → 04...
    ↑                               ↓
16 ← 88 ← 16 ← 87 ← 16 ← 86 ← 16...
```

Note: TX is disabled when scanning.

1. Press the **DW/SCAN** key to show the [DW/SCAN] option.



2. With [SCAN] selected, push the **CHANNEL/ENTER** knob. The scanning starts and the "SCAN" icon appears on the screen.



When the receiver detects a carrier and the squelch opens, the scanning is stopped on that channel.

- When the squelch opens on the channel except CH16, dual watch starts on it and CH16.
- When the squelch opens on the CH16, the CH16 is set.

When the squelch closes, the scanning restarts.

To stop the scanning, do one of the following:

- Press the **CANCEL** key.
- Press the **CH16** key.
- Press the **DISTRESS** key.
- Press the **DW/SCAN** key.
- Off hook a handset if there is one on hook.
- Press the **PTT** switch of a handset that is off hook. In this case, press the **PTT** switch again to transmit.
- Activate another session.
- Select [HOLD] in the RT session.
- Select [QUIT] in the RT session.
- Press the **MENU** key.
- Press the **RT/REGION** key.

1.11 How to Set the Auto Acknowledgement

Individual, PSTN (public switched telephone network), position, polling and test calls can be acknowledged automatically or manually. This is set on the [ACK SETTINGS] in the [DSC] menu (see section 5.16).

Note: When own ship's communication is high priority, set to manual acknowledgement.

The auto acknowledgement is not sent in the following cases:

- Other session is active.
- There are RT or DSC sessions (for individual call).
- Channel is in use.
- ECC is NG (No Good).

Note: The auto acknowledgement for the individual call is sent only when the proposed channel or communication mode is not available.

1.12 Priority of the System

If one or more remote stations are installed, the transceiver unit has the highest priority. You can interrupt remote station operation at any time with the handset of the main unit. When you hook off the handset of the main unit, "OCCUPIED BY: FM-8900S" (Default. This can be changed.) is indicated on all remote stations. Each remote station has its own priority. The remote station ID (1-4) indicates its priority. The priority

1. OPERATIONAL OVERVIEW

of the system is as follows.

Transceiver unit = Analog wing handset >

Digital wing handset L = Digital wing handset R > Remote station 1 >

Remote station 2 > Remote station 3 > Remote station 4

If you hook off No.4 remote station, for example, "IN USE BY: HANDSET_P4" is displayed on other remote stations and "HANDSET_P4: OPERATION" on the transceiver unit. However, you can hook off and use No.1 remote station.

The terminal which you operate has priority in the following conditions:

- The handset goes off hook.
- Display the menus or setting windows.
- Display each function screen (for example, Log).
- Switch the session.
- Press a key or rotate the **CHANNEL/ENTER** knob. (The priority is lost after four seconds.)

How to set the terminal ID

1. Disconnect the power plug of a remote station to turn off the remote station.
2. While pressing the **MENU** key of a remote station, connect the plug to turn on the power.
3. Enter the terminal ID, using the **1** to **6** keys, then press the **ENTER** key. Do not assign the same number to multiple remote stations.
4. Turn off and on the power of the transceiver unit.

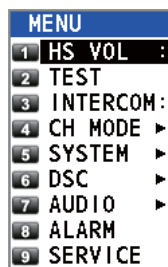
1.13 Intercom

The built-in intercom permits voice communications between two terminals.

Calling

You can call over the intercom in on or off hook condition.

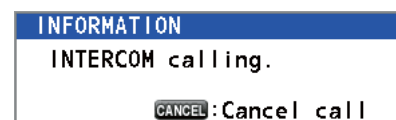
1. Press the **MENU** key to open the [MENU] screen.



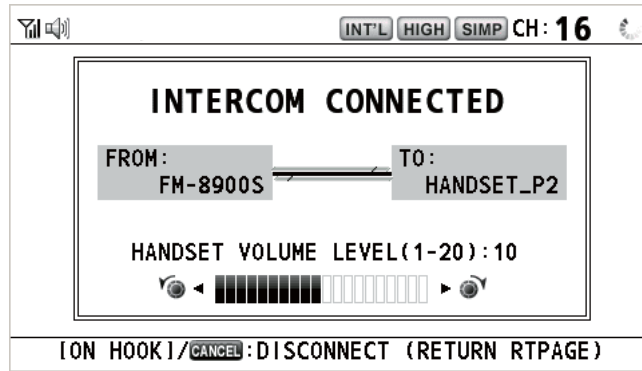
2. Rotate the **CHANNEL/ENTER** knob to select [INTERCOM] then push the knob.



3. Rotate the **CHANNEL/ENTER** knob to select the called party's terminal then push the knob. The called party's terminal rings. To cancel calling, press the **CANCEL** key.



- When the called party picks up their handset, the following screen appears.



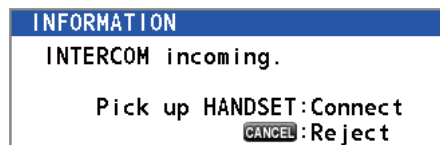
Start communications.

Note: You do not have to press the **PTT** switch to communicate.

- If needed, adjust the handset volume by rotating the **CHANNEL/ENTER** knob.
- Hang up the handset or press the **CANCEL** key to turn the intercom off. The last-used screen appears.

Answering

- The terminal rings and the following screen appears. To cancel reply, press the **CANCEL** key.

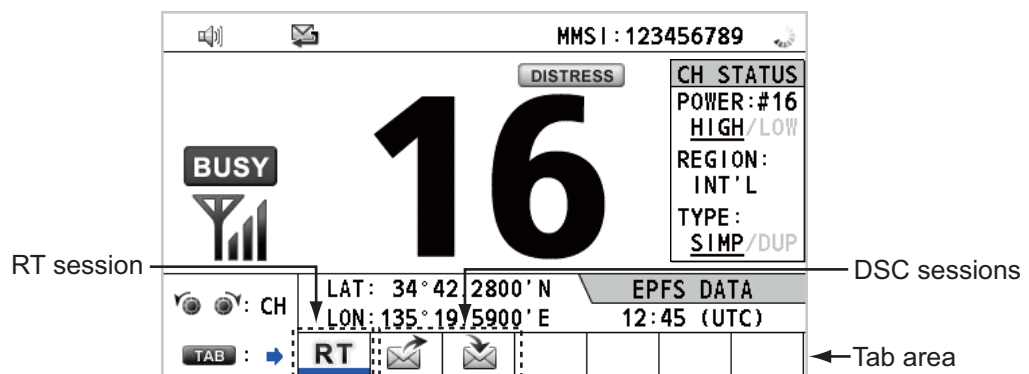


- Pick up the handset to start communications.
- Hang up the handset or press the **CANCEL** key to turn the intercom off. The last-used screen appears.

1.14 Operation of Session

Description of session

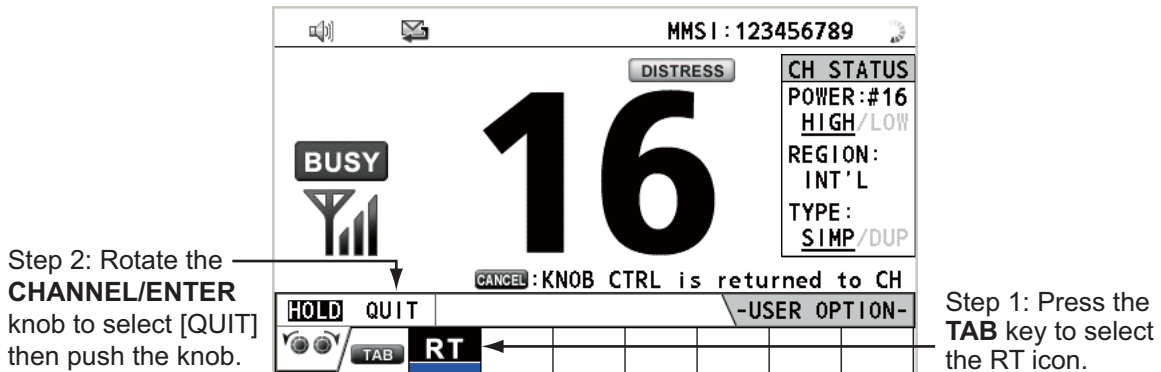
There are two types of sessions: RT session and DSC session. When a session starts, the applicable icon for the session appears in the tab area.



How to finish a single session

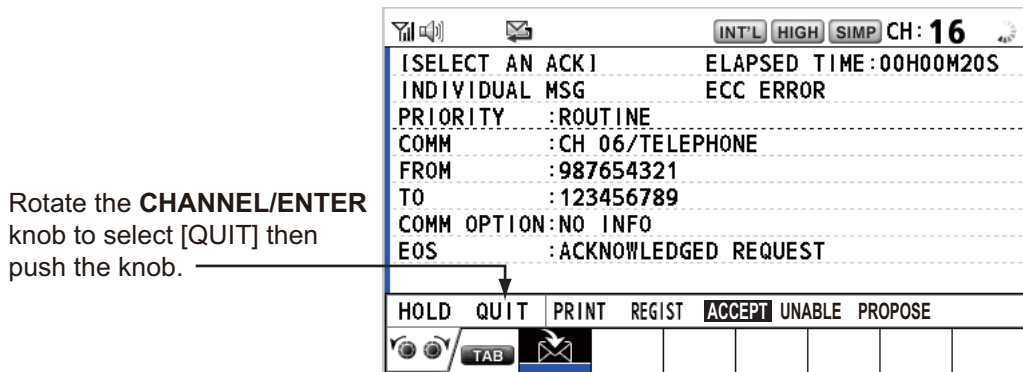
RT session

1. Press the **TAB** key to select the RT icon in the tab area.
2. Rotate the **CHANNEL/ENTER** knob to select [QUIT] then push the knob.



DSC session

The cursor is in the tab area when the DSC session starts. Rotate the **CHANNEL/ENTER** knob to select [QUIT] then push the knob.



How to start a new session

When another session is active:

- When sending the distress alert, all sessions except the distress alert TX session automatically close then the distress alert TX session starts.
- When doing an RT session or sending a non-distress DSC message, the currently active session is put on hold then the RT session or non-distress DSC message TX session starts.
- When receiving a DSC message, its session is put on hold.

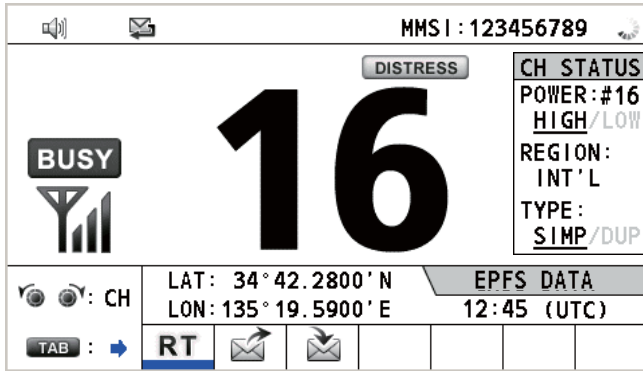
When no other session is active:

- When sending the distress alert, all sessions except the distress alert TX session automatically close then the distress alert TX session starts.
- When sending a non-distress DSC message, its session becomes the active session.

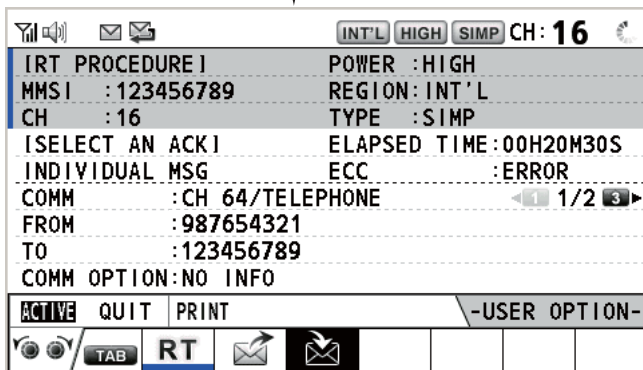
How to switch sessions

When one session is active and another message arrives, a new session for the received message does not start automatically. Only one session can be active. For ex-

ample, when you are transmitting a DSC message and another message arrives, the indication [ACTIVE] appears to indicate the start of a new session.



↓ Press the **TAB** key to move the cursor to the tab area.



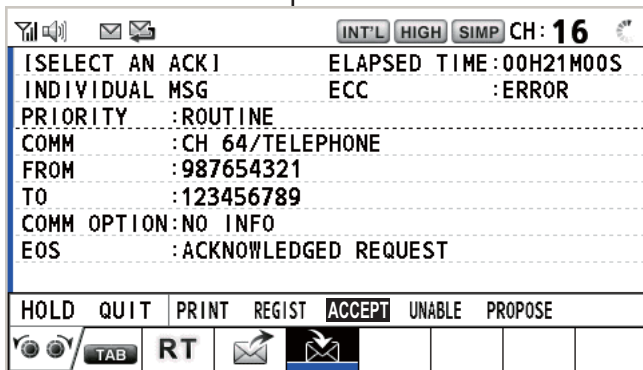
Information for the session underlined in blue (RT in this case)

Information for the session selected by cursor.

← User options area

← Tab area

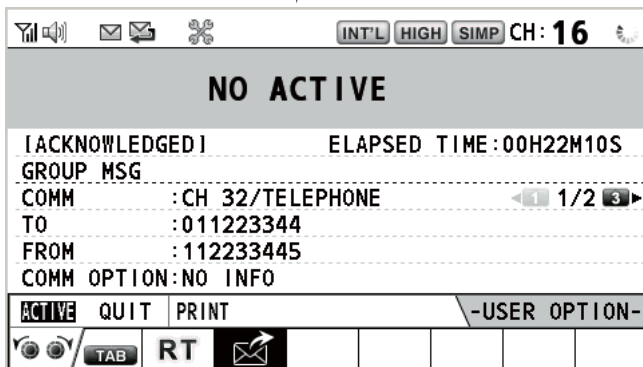
↑ To select a session, press the **TAB** key. The cursor is here. With [ACTIVE] selected, push the **CHANNEL/ENTER** knob to switch the active session ([ACTIVE], [QUIT], [PRINT]), rotate the **CHANNEL/ENTER** knob.




Only the screen for the selected session appears.

↓ To finish this session, rotate the **CHANNEL/ENTER** knob to select [QUIT] then push the knob.

Note: When waiting for the ACK, that is, the session is in progress, the confirmation message appears. Rotate the **CHANNEL/ENTER** knob to select [Yes] or [No] then push the knob.



The  icon disappears.

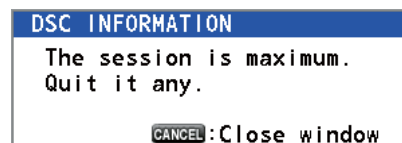
How to close a session

To manually close a session, select it with the **TAB** key. Rotate the **CHANNEL/ENTER** knob to select [QUIT] in the user options area then push the knob. The session icon disappears from the tab area.

When there is no operation for the time specified (see section 5.8), the inactive session is automatically closed.

Processing when the number of sessions is maximum

A maximum of seven sessions can be displayed in the tab area. If a seventh session starts, the message as shown in the right figure appears on the screen. Press the **CANCEL** key to close the message. Close a session to make space for the new session.



If the eighth session is for sending a distress alert, all sessions except that session automatically close, and the session starts.

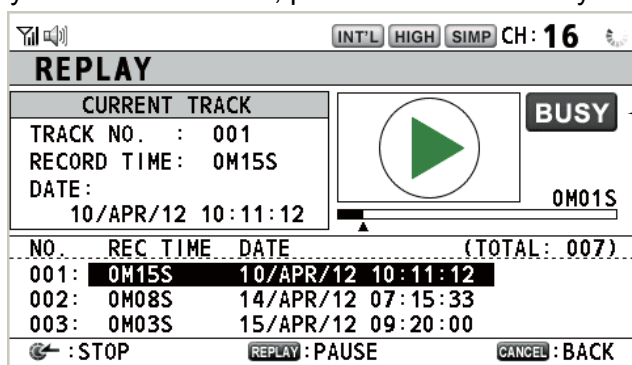
If the eighth session is for receiving DSC message, the lowest-priority session automatically closes and the message as shown in the right figure appears. Press the **CANCEL** key to close the message.



1.15 Replay Function

You can replay a recorded voice, which has been received recently, for a total of 120 seconds. The recorded voices are saved in this equipment with the channel information, and deleted when turning the power off.

To replay the recorded voice, press the **REPLAY** key.



← Appears only when the squelch opens.

When the replaying is finished, the indication changes to .

To change the track number, rotate the **CHANNEL/ENTER** knob to select the track number desired then push the knob to replay the selected data.

To stop the replaying and close the screen in the middle, press the **CANCEL** key. Also, you can stop the replaying with the **CHANNEL/ENTER** knob. In this case, the [REPLAY] screen does not close.

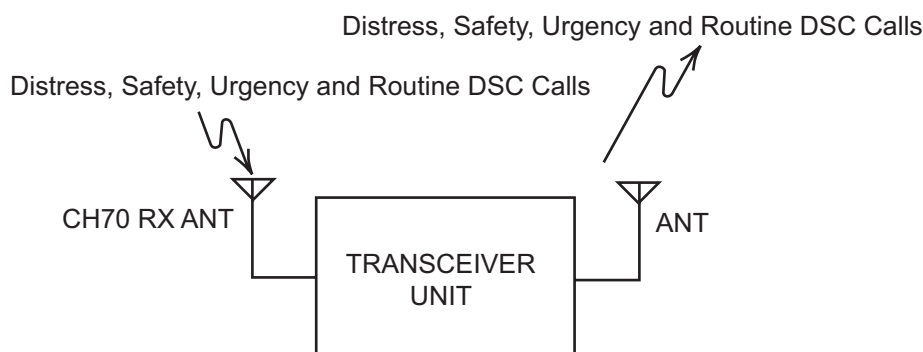
Note: When the time limit (120 seconds) has passed, the recorded data is deleted per track in earliest to latest order.

2. DSC OVERVIEW

2.1 What is DSC?

DSC is an acronym meaning Digital Selective Calling. It is a digital distress and general calling system in the VHF band used by ships for transmitting distress alerts and general calls and by coast stations for transmitting the associated acknowledgements.

For DSC distress, safety and urgency callings in the VHF band, the channel is 70.



2.2 DSC Messages

DSC calls are roughly divided in two groups: distress messages and general (safety, urgency and routine) messages. Below are the types of DSC messages.

Call	Description
DISTRESS ALERT	Your ship sends distress message.
DISTRESS RELAY ALL	Your ship relays distress call to all ships.
DISTRESS RELAY INDIVIDUAL	Your ship relays distress call to a coast station or all ships.
MEDICAL MSG*	Inform areas that your ship is carrying medical supplies.
NEUTRAL MSG*	Inform areas that your ship is not a participant in armed conflict.
INDIVIDUAL MSG	Call to a specific address.
PSTN MSG	Call over Public Switched Telephone Network (PSTN).
TEST MSG	Send test signal to a station to test your station's functionality.
GROUP MSG	Call to a specific group.
ALL SHIPS MSG	Call to all ships.
POSITION MSG	Your ship requests position of other ships.
POLLING MSG	Confirm if your ship is within communicating range with other ships. (Receive and answer only)

*SPECIAL MSG: To send these messages, set [SPECIAL MSG] to [ABLE]. See section 5.17.

Contents of a DSC call

- **Calling category**
DISTRESS: DISTRESS ALERT, DISTRESS RELAY ALL, DISTRESS RELAY INDIVIDUAL, DISTRESS RELAY AREA (Received only), DISTRESS ACK
GENERAL: MEDICAL MSG, NEUTRAL MSG, INDIVIDUAL MSG, PSTN MSG, TEST MSG, GROUP MSG, ALL SHIPS MSG, POSITION MSG, POLLING MSG
- **Station ID (MMSI)**
 Your ship ID and sending station ID. Coast station ID begins with 00; Group ID begins with 0.
- **Priority**
Distress: Grave and imminent danger and request immediate assistance.
Urgency: A calling station has a very urgent call to transmit concerning safety of ship, aircraft or other vehicle or safety of person.
Safety: A station is about to transmit a call containing an important navigational or meteorological warning.
Routine: General calling
- **Communication mode**
TELEPHONE: Telephone (F3E/G3E) by VHF radiotelephone
- **Communication channel**
 Working frequency channel used to call by telephone. The sending station may have the receiving station (ship or coast station) assign the frequency channel to use.
- **Position**
 Position can be automatically or manually set.
- **End code**
 The end of a DSC call is indicated with "EOS" (acknowledgement, acknowledgement required, no acknowledgement required).

2.3 Audio Alarms

When you receive a distress alert or general call addressed to your ship, the audio and visual alarms are released. The audio alarm can be silenced with the **CANCEL** key.

Alarm	When	Frequency (interval)
Count alarm	Counting down the time remaining before the distress alert is transmitted.	2000 Hz (500 ms) → silent (500 ms); three times
Distress RX alarm	The following sessions are received: distress alert, relay individual, relay area, or relay all.	2200 Hz (250 ms) → 1300 Hz (250 ms); repetition
Distress TX alarm	Sending or resending the distress alert.	2200 Hz (2000 ms); once
Distress ACK alarm	The following sessions are received or received then acknowledged: distress ACK, distress ACK (cancel ACK), relay individual ACK, or relay all ACK.	2200 Hz (500 ms) → 1300 Hz (500 ms); repetition
Urgency alarm	The following urgency sessions are received: all ships, neutral, medical, or individual.	2200 Hz (250 ms) → silent (250 ms); repetition
Urgency ACK alarm	The sessions for urgency individual ACK are received then acknowledged. The sessions for delayed ACK are received.	2200 Hz (500 ms) → silent (500 ms); repetition

Alarm	When	Frequency (interval)
Ordinary alarm	The following sessions are received: <ul style="list-style-type: none"> • Safety: all ships, individual, position, or test. • Routine: individual, group, polling, or PSTN. 	The following set is repeated: 750 Hz (50 ms) and 650 Hz (50 ms); ten times → silent (2000 ms); once
Ordinary ACK alarm	The following sessions are received then acknowledged: <ul style="list-style-type: none"> • Safety: individual ACK, position ACK, test ACK. • Routine: individual ACK. The sessions for delayed ACK are received.	The following set is repeated: 750 Hz (50 ms) and 650 Hz (50 ms); ten times → silent (2000 ms); once
Self terminating alarm	<ul style="list-style-type: none"> • There are the related sessions for call messages. • The related sessions for ACK messages were already acknowledged. • Sending the individual unable auto ACK or PSTN unable auto ACK. • The following sessions are received: relay area (duplicate), relay all (duplicate), or PSTN end of call ACK. 	1300 Hz (100 ms) → silent (300 ms) → 1300 Hz (100 ms) → silent (50 ms) → 1300 Hz (100 ms)

2.4 Description of Call Screens

This section provides the information necessary for interpreting the receive and send call screens.

2.4.1 RX calls

Below are sample distress relay and individual RX call screens. The contents of other types of RX calls are similar to that of the individual call.

Distress relay

Individual RX call

2. DSC OVERVIEW

The characters "*", "-" appear on the DSC receiving screen in the following conditions:

- "*" indicates a corrupt character in received data.
- "-" indicates missing digits after decimal point when receiving position data with no info for expansion (expansion: digits after decimal point).

Examples:

- 1) When receiving position data without expansion, the indication is "LAT: 12°34'N".
- 2) When receiving position data with expansion, the indication is "LAT: 12°34,5678'N".
- 3) When receiving position data with no info for expansion, the indication is "LAT: 12°34,----'N".

2.4.2 TX calls

Below are sample distress alert and individual TX call screens. The contents of other types of TX calls are similar to that of the individual call.

Distress alert

INT'L HIGH SIMP CH: 16

COMPOSE MESSAGE

MSG TYPE : **DISTRESS ALERT**

DISTRESS ID: **123456789**

NATURE : **UNDESIGNATED**

LAT : **34° 42.2800' N**

LON/UTC : **135° 19.5900' E / 12:34**

COMM MODE : **TELEPHONE**

PRESS DISTRESS BUTTON
TO SEND DISTRESS ALERT.

CANCEL : BACK

← Nature of Distress

← Position of ship in distress (your ship) and time of distress position

← Communication mode

Individual TX call

INT'L HIGH DUP CH: 20

COMPOSE MESSAGE

MSG TYPE : **INDIVIDUAL MSG**

TO : **123456789**

PRIORITY : **ROUTINE**

COMM MODE : **TELEPHONE**

COMM CH : **06**

CANCEL : BACK GO TO CALL

← Message type (Individual)

← Priority (Routine, Safety, Urgency)

← Communication mode

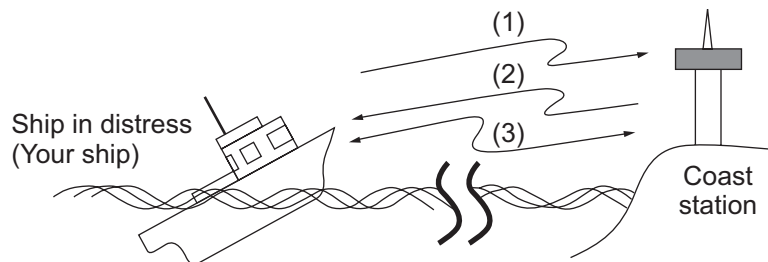
← ID No. of station where message is to be sent

← Communication channel

3. DSC DISTRESS OPERATIONS

Distress operation overview

1. Press the **DISTRESS** key.
2. Wait for the distress alert acknowledgement.
3. Communicate with the coast station.



- (1) Ship in distress sends Distress Alert.
- (2) Coast station sends distress acknowledgement (DIST ACK).
- (3) Voice communication between ship in distress and coast station.

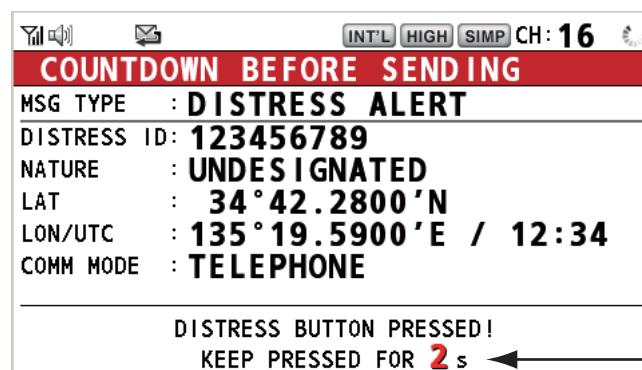
3.1 How to Send a Distress Alert

GMDSS ships carry a DSC terminal with which to transmit the distress alert in the event of a life-endangering situation. A coast station receives the distress alert and sends the distress alert acknowledge call to the ship in distress. Then, voice communication between the ship in distress and coast station begins. Transmission of the distress alert and receiving of the distress alert acknowledgement are completely automatic - simply press the **DISTRESS** key to initiate the sequence.

Note: After sending the distress alert, the terminal which its **PTT** switch is pressed first has top priority.

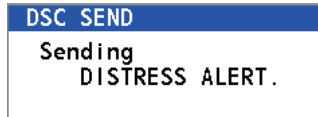
3.1.1 How to send a distress alert by **DISTRESS** key with distress information not edited

1. Open the **DISTRESS** key cover then press and hold the **DISTRESS** key for four seconds. The audio alarm sounds while pressing the key, and the key flashes in red. The countdown message appears on the screen while pressing the **DISTRESS** key (3s → 2s → 1s → 0s).



3. DSC DISTRESS OPERATIONS

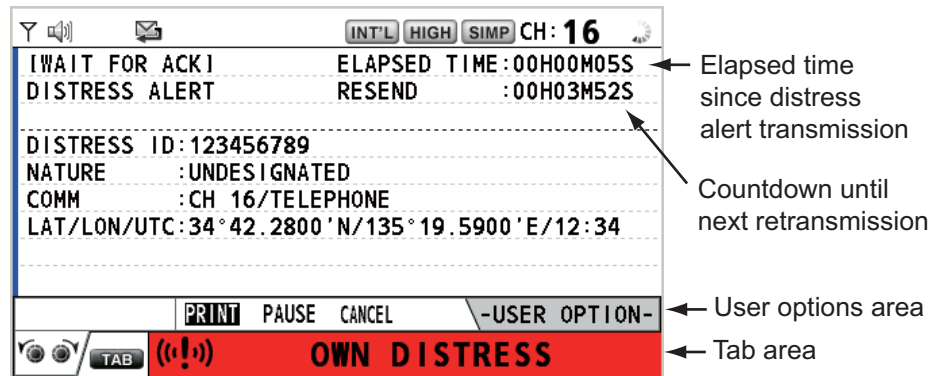
When the countdown shows 0s, the distress alert is sent. The audio alarm sounds for two seconds and the message "Sending DISTRESS ALERT." appears.



The **DISTRESS** key lights in red and only the icon for DISTRESS transmission

() is displayed in the tab area.


After the distress alert has been sent, the screen changes as below. Wait to receive the distress acknowledge call from a coast station. The elapsed time since transmission is displayed. At this time, the icons for other DSC received messages except the distress alert acknowledge call are not displayed. You can only confirm them in the log.

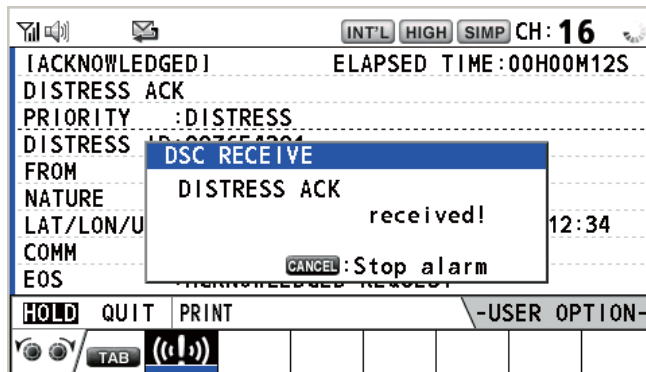


Note: If you do not receive the distress alert acknowledge call, the equipment automatically re-transmits the distress alert after 3 min 30 seconds to 4 min 30 seconds. The equipment then awaits the distress alert acknowledge call. This is repeated until the distress alert is acknowledged.

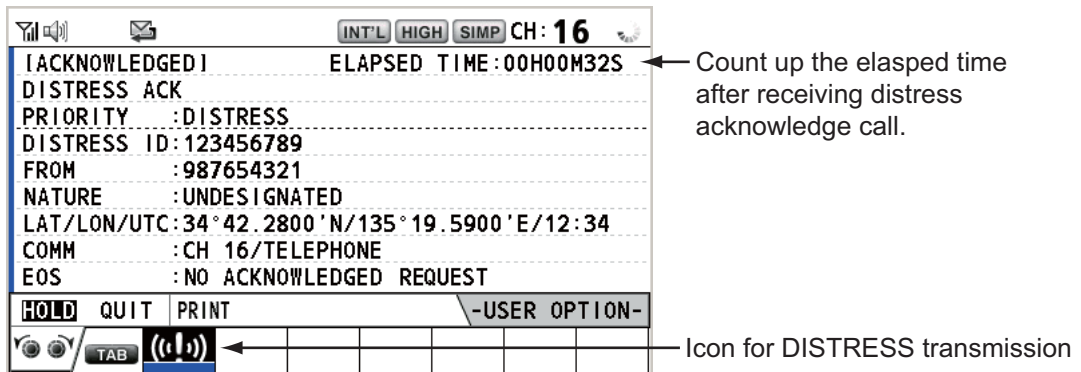
You can temporarily stop the countdown for next retransmission by selecting [PAUSE] in the user options area. The [PAUSE] indication changes to [START] and [PAUSE] is displayed instead of the countdown indication. To restart, select [START]. The countdown restarts and the [START] indication changes to [PAUSE].

Also, you can re-send the distress alert manually by pressing and holding the **DISTRESS** key for four seconds.

When the distress acknowledge call is received, the audio alarm sounds, the LED flashes in red, and the icon for DISTRESS transmission () appears. The screen changes as below.



2. Press the **CANCEL** key to silence the audio alarm. Then, the LED stops flashing, and the pop-up message disappears.



3. Communicate with the coast station via radiotelephone, following the instructions below.
 - a) Say “MAYDAY” three times.
 - b) Say “This is ...” name of your ship and call sign three times.
 - c) Give nature of distress and assistance needed.
 - d) Give description of your ship (type, color, number of persons onboard, etc.).

3.1.2 How to send a distress alert by DISTRESS key with distress information edited

If you have a time to prepare the distress information, send the distress alert as follows:

1. Press the **DISTRESS MSG** key to display the following screen.



2. With [NATURE] selected, push the **CHANNEL/ENTER** knob.
3. Rotate the **CHANNEL/ENTER** knob to select the nature of distress, among the following 11 selections, then push the knob.
 - UNDESIGNATED
 - FIRE
 - FLOODING
 - COLLISION
 - GROUNDING
 - LISTING
 - SINKING
 - DISABLED&ADR(IFT)
 - ABANDONING
 - PIRACY
 - MAN OVERBOARD

3. DSC DISTRESS OPERATIONS

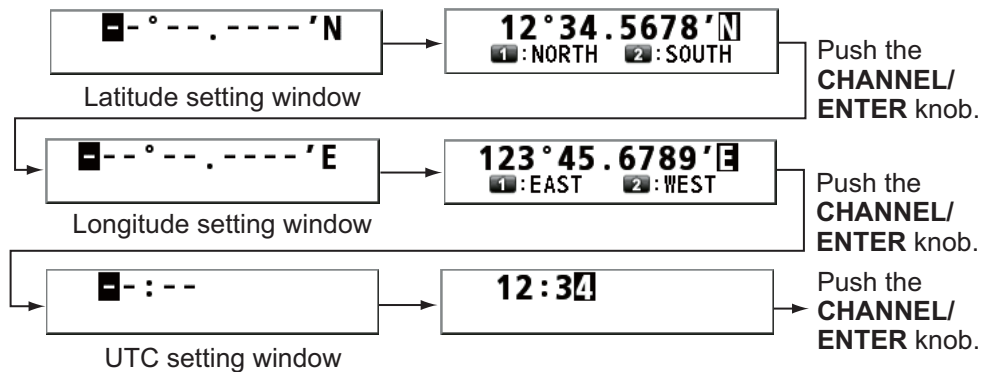
- With [LAT] and [LON/UTC] selected, push the **CHANNEL/ENTER** knob.



The option which you last-selected is highlighted.

[EPFS]: The position information from EPFS is automatically shown.
 [MANUAL]: Input your position manually.
 [NO INFO]: No information.

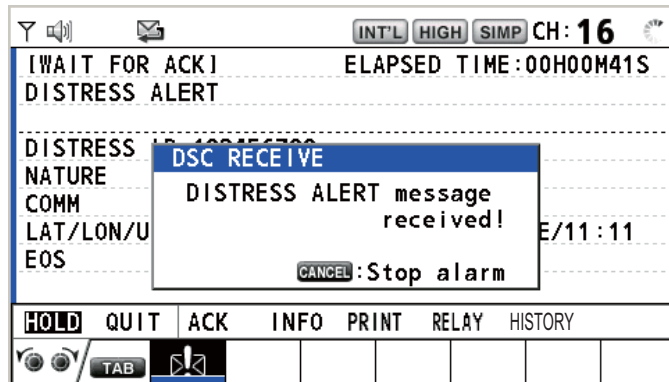
- Rotate the **CHANNEL/ENTER** knob to select [EPFS], [MANUAL] or [NO INFO] then push the knob. For [MANUAL], go to step 6. For others, go to step 7.
- Use the numeric keys to enter latitude, longitude and UTC time. (If necessary, switch coordinates: **1** key to switch to North (East for longitude); **2** key to switch to South (West for longitude).) Push the **CHANNEL/ENTER** knob.



- Press and hold the **DISTRESS** key for four seconds to send the distress alert. The audio alarm sounds while pressing the key, and the key flashes in red. The countdown message appears on the screen while pressing the **DISTRESS** key (3s → 2s → 1s → 0s) (refer to the illustration at step 1 in paragraph 3.1.1). When the countdown shows 0s, the distress alert is sent. The audio alarm sounds for two seconds and the message "Sending DISTRESS ALERT." appears.
- When the distress acknowledge call is received, use the telephone to communicate with the coast station referring to step 3 in paragraph 3.1.1.

3.2 How to Receive a Distress Alert

When you receive a distress alert from a ship in distress, the audio alarm sounds and the LED flashes in red. The icon for DISTRESS receiving (📞🚨) appears in the tab area and the pop-up message "DISTRESS ALERT message received! [CANCEL]: Stop alarm" appears on the screen.

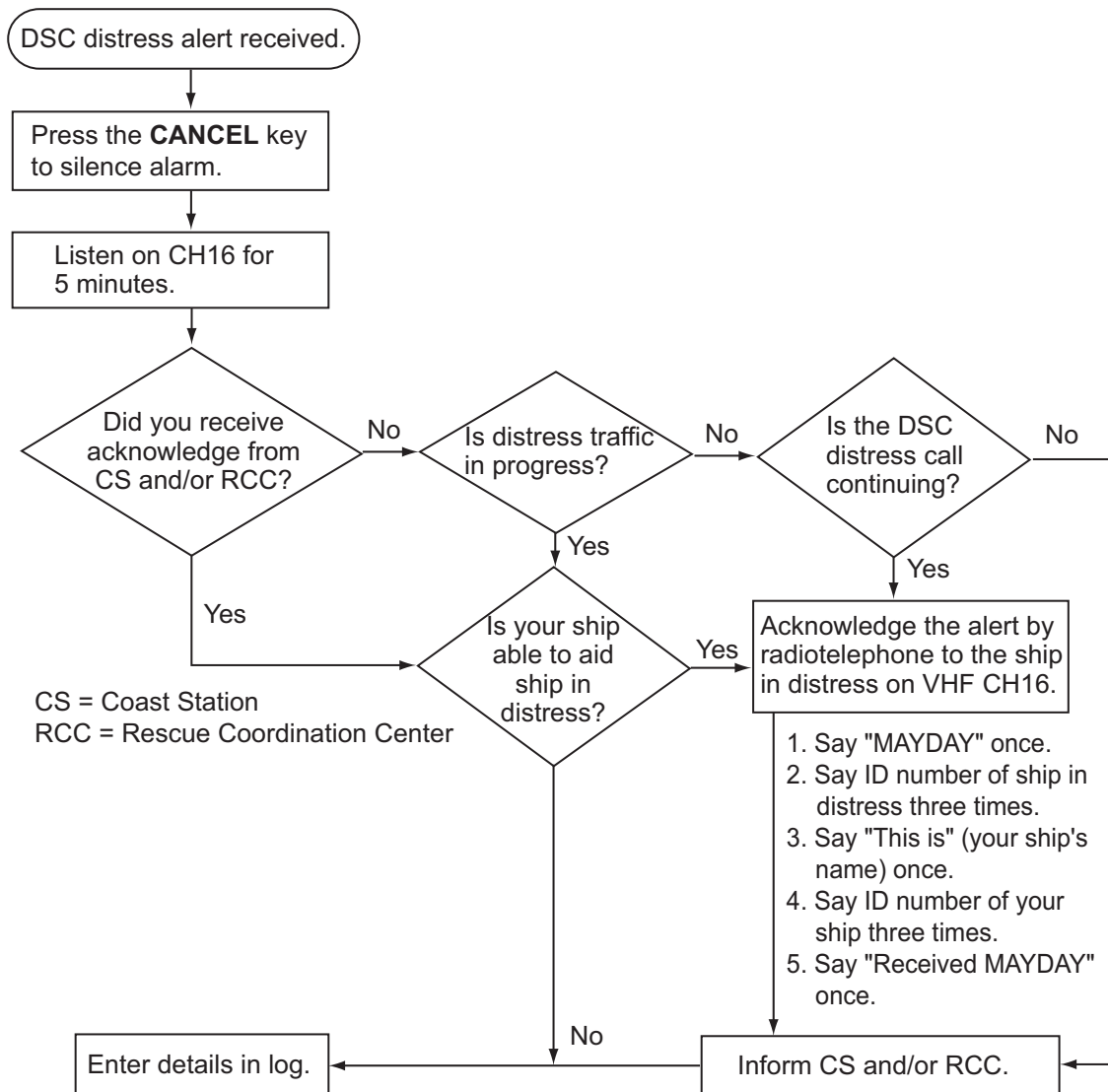


Press the **CANCEL** key to silence the audio alarm. Wait for the distress acknowledge call from a coast station. If you do not receive the distress acknowledge call from a coast station, which usually takes about five minutes from the time of receiving a distress alert, follow the flow charts in this section to determine your action.

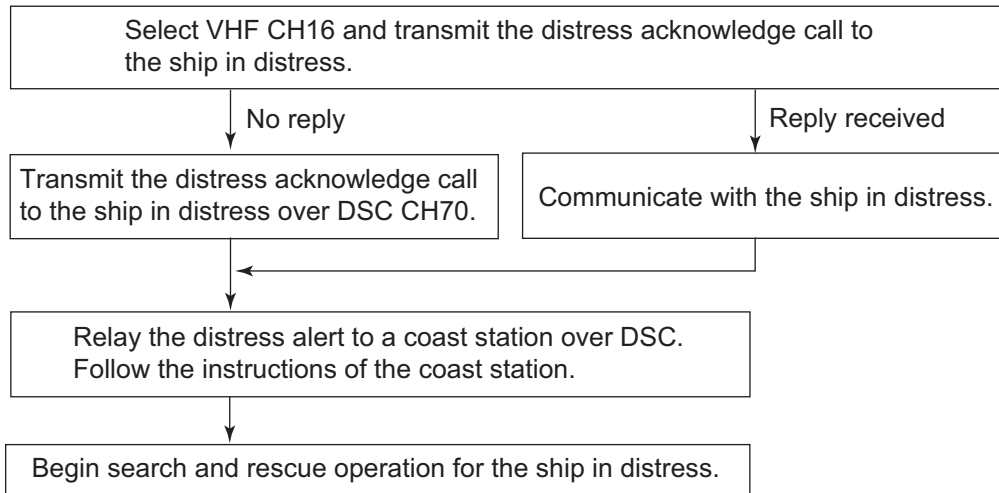
Note: An asterisk (*) appearing in a distress alert message indicates an error at the asterisk's location.

In no case is a ship permitted to transmit a DSC distress relay call upon receipt of a DSC distress alert on VHF channel 70.

Flow chart for determining if you should/should not transmit a distress acknowledge call



How to transmit a distress acknowledge call over CH16



Procedure when in area A1

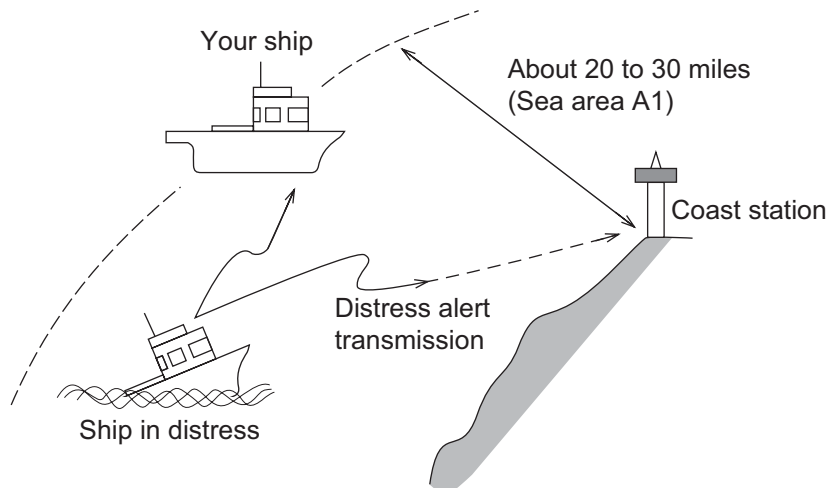
When you receive a distress alert from a ship in distress, the audio alarm sounds and the LED flashes in red. The icon for DISTRESS receiving (📶🚨) appears in the tab area and the pop-up message "DISTRESS ALERT message received! [CANCEL]: Stop alarm" appears on the screen.

Press the **CANCEL** key to silence the audio alarm. Wait for the distress acknowledge call from a coast station. If you do not receive the distress acknowledge call from a coast station, which usually takes about five minutes from the time of receiving a distress alert, follow the flow charts on page 3-5.

If further DSC alerts are received from the same source and the ship in distress is beyond doubt in the vicinity, a DSC acknowledgement may, after consultation with a Rescue Coordination Center (RCC) or Coast Station, be sent to terminate the distress call.

Note 1: An asterisk (*) appearing in a distress alert message indicates an error at the asterisk's location.

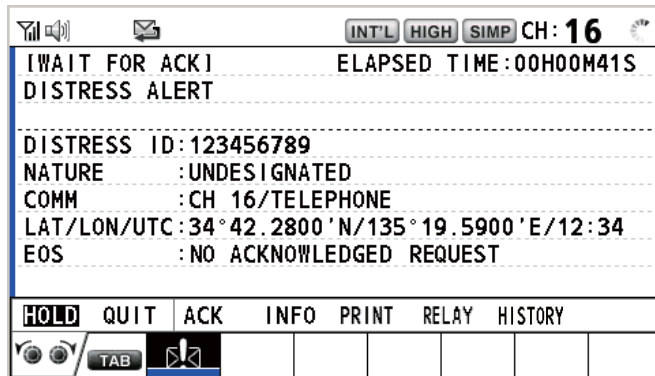
Note 2: Do not send the distress acknowledge call in response to receipt of distress alert having the nature of distress as "EPIRB emission".



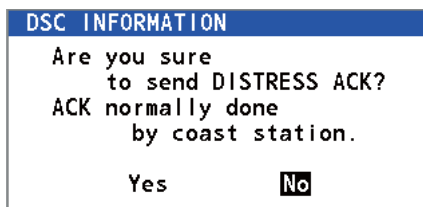
How to send a distress acknowledge call

When you receive a distress alert from a ship in distress, the audio alarm sounds and the LED flashes in red. If your ship meets the requirements necessary to transmit the distress acknowledge call, do the following:

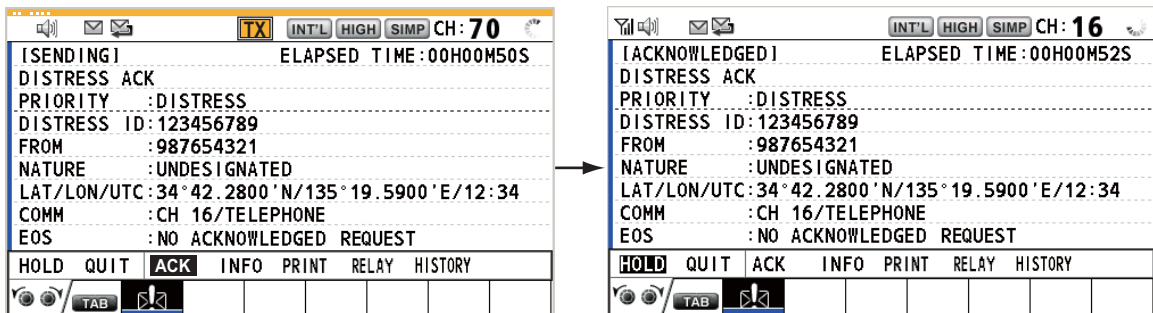
1. Press the **CANCEL** key to silence the audio alarm and stop the flashing of the LED.



2. Rotate the **CHANNEL/ENTER** knob to select [ACK] in the user options area then push the knob. The following message appears on the screen.



3. If you do not receive the distress acknowledge call from a coast station within five minutes and your ship meets requirements for transmitting the distress acknowledge call, rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob to send the distress acknowledge call to the ship in distress. The screen changes as below.

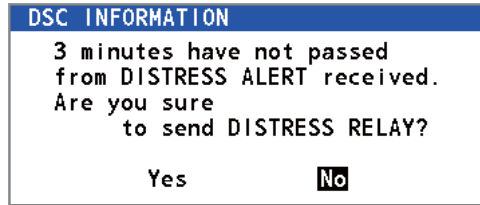


Begin search and rescue operations for the ship in distress, communicating with the ship over CH16 (automatically set). Relay distress alert to a coast station by DSC following the instruction in the next section. Finally, follow the instructions of the coast station.

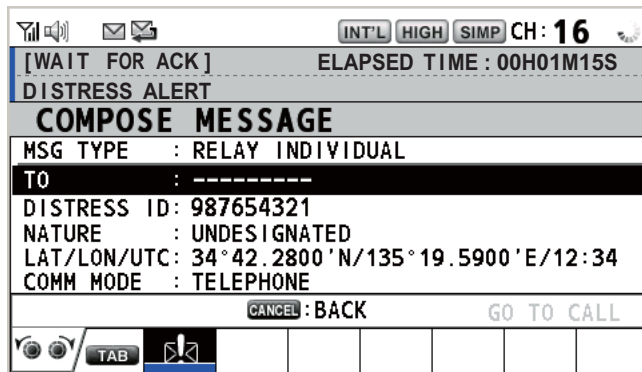
How to send a distress relay to a coast station

You can send the distress relay to a coast station from the receiving screen for the distress alert.

1. Rotate the **CHANNEL/ENTER** knob to select [RELAY] in the user options area then push the knob. If three minutes have not passed from the time the distress alert was received, the following message appears.



2. Rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob to open the composing screen for the distress relay individual.

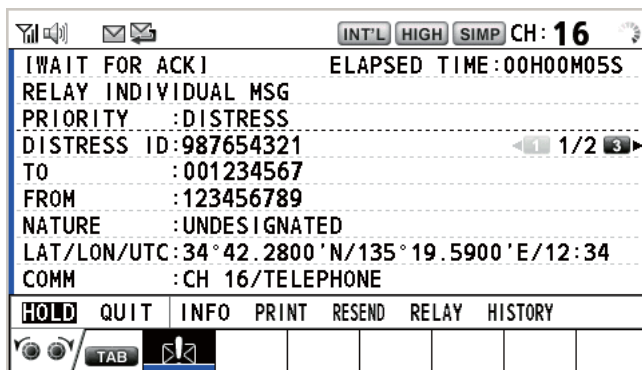


3. With [TO] selected, push the **CHANNEL/ENTER** knob.
4. Rotate the **CHANNEL/ENTER** knob to select [DIRECT INPUT], [ADDRESS BOOK DATA] or [AIS TARGET DATA] then push the knob.
 [DIRECT INPUT]: Enter the MMSI, where to send the distress relay, with the numeric keys then push the **CHANNEL/ENTER** knob.
 [ADDRESS BOOK DATA]: Select an MMSI from the [ADDRESS BOOK] (see section 5.13) then push the **CHANNEL/ENTER** knob.
 [AIS TARGET DATA]: Select an MMSI from the [AIS TARGET LIST] then push the **CHANNEL/ENTER** knob.

AIS target list

If an AIS transponder is connected to the radiotelephone, you can select a MMSI from the [AIS TARGET LIST].

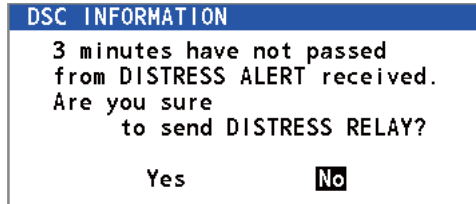
5. With [GO TO CALL] selected, push the **CHANNEL/ENTER** knob. The distress relay is transmitted. After transmitting, the WAIT FOR ACK screen appears. The elapsed time since transmitting is displayed.



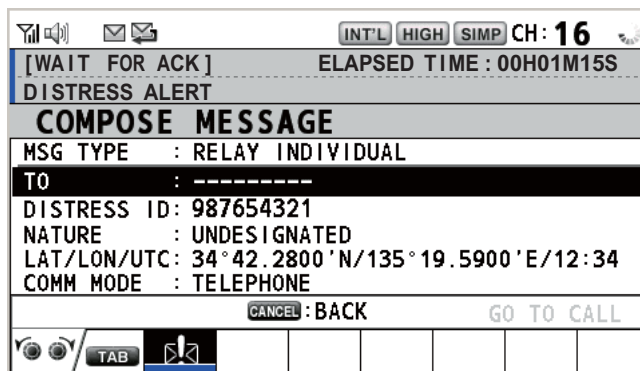
How to send a distress relay all

You can send the distress relay all from the receiving screen for the distress alert.

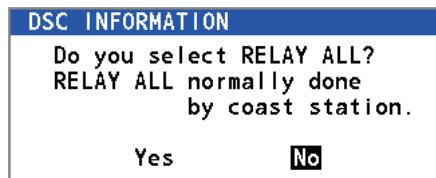
1. Rotate the **CHANNEL/ENTER** knob to select [RELAY] in the user options area then push the knob. If three minutes have not passed from the distress alert received, the following message appears.



2. Rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob to open the composing screen for the distress relay individual.



3. Rotate the **CHANNEL/ENTER** knob to select [MSG TYPE] then push the knob.
4. Rotate the **CHANNEL/ENTER** knob to select [RELAY ALL] then push the knob. The following message appears.



5. Rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob.
6. With [GO TO CALL] selected, push the **CHANNEL/ENTER** knob. The distress relay is transmitted to all ships.

3.3 How to Send a Distress Relay on Behalf of a Ship in Distress

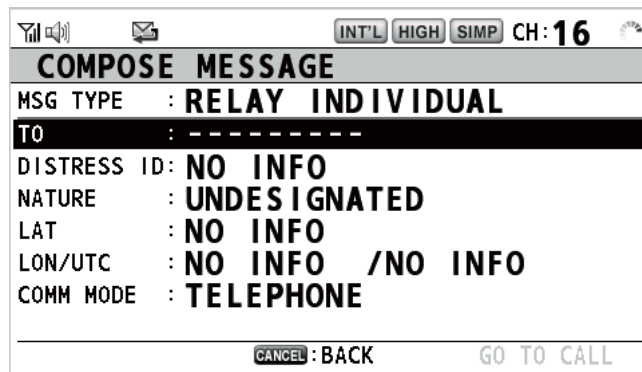
3.3.1 How to send a distress relay to a coast station

You can send the distress relay to a coast station on behalf of a ship in distress in the following cases:

- You are near the ship in distress and the ship in distress cannot transmit the distress alert.
- When the master or person responsible for your ship considers that further assistance is necessary.

Note: Do not use the **DISTRESS** key to relay distress.

1. Press the **DISTRESS MSG** key and the **OTHER DSC MSG** key simultaneously to open the composing screen for the distress relay individual.



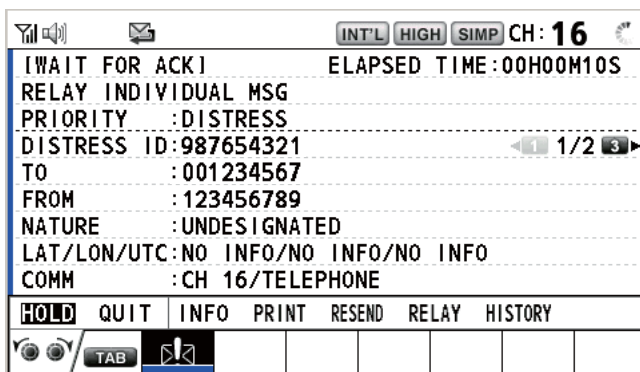
2. With [TO] selected, push the **CHANNEL/ENTER** knob.
3. Rotate the **CHANNEL/ENTER** knob to select [DIRECT INPUT], [ADDRESS BOOK DATA] or [AIS TARGET DATA] then push the knob.
 [DIRECT INPUT]: Enter the MMSI, where to send the distress relay, with the numeric keys then push the **CHANNEL/ENTER** knob.
 [ADDRESS BOOK DATA]: Select an MMSI from the [ADDRESS BOOK] (see section 5.13) then push the **CHANNEL/ENTER** knob.
 [AIS TARGET DATA]: Select an MMSI from the [AIS TARGET LIST] then push the **CHANNEL/ENTER** knob.
4. With [DISTRESS ID] selected, push the **CHANNEL/ENTER** knob.



5. Rotate the **CHANNEL/ENTER** knob to select [DIRECT INPUT] or [NO INFO] then push the knob. For [DIRECT INPUT], go to step 6. For [NO INFO], go to step 7.
6. Enter the ID (MMSI) of the ship in distress with the numeric keys then push the **CHANNEL/ENTER** knob.
7. With [NATURE] selected, push the **CHANNEL/ENTER** knob.
8. Rotate the **CHANNEL/ENTER** knob to select nature of distress then push the knob.
9. With [LAT] and [LON/UTC] selected, push the **CHANNEL/ENTER** knob.



10. Rotate the **CHANNEL/ENTER** knob to select [EPFS], [MANUAL] or [NO INFO] then push the knob. For [MANUAL], go to step 11. For others, go to step 12.
11. Use the numeric keys to enter latitude and longitude of the ship in distress. (If necessary, switch coordinates: **1** key to switch to North (East); **2** key to switch to South (West).) Push the **CHANNEL/ENTER** knob. Also, enter the UTC time then push the **CHANNEL/ENTER** knob.
12. With [GO TO CALL] selected, push the **CHANNEL/ENTER** knob. The distress relay is transmitted. After transmitting, the WAIT FOR ACK screen appears. The elapsed time since transmitting is displayed.



When you receive the distress relay individual acknowledgement from the coast station, the audio alarm sounds and the pop-up message "RELAY INDIVIDUAL ACK received! [CANCEL]: Stop alarm" appears.

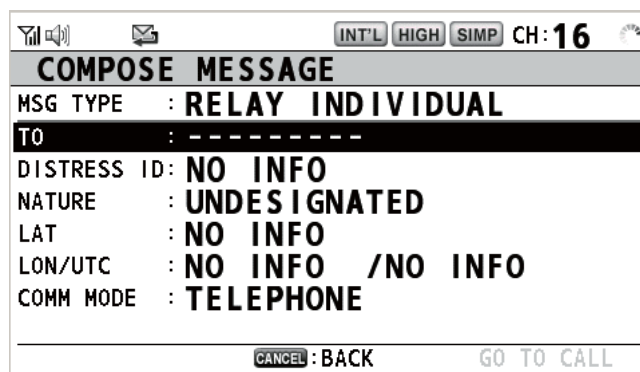


Press the **CANCEL** key to silence the alarm and erase the pop-up message. Communicate with the coast station by telephone. To close the distress receiving session, select [QUIT] in the user options area then push the **CHANNEL/ENTER** knob.

3.3.2 How to send a distress relay to all ships

If a coast station directs you to send a distress relay to all ships in your area, follow the procedure below. Do not transmit a distress relay unless directed to do so by a coast station.

1. Press the **DISTRESS MSG** key and the **OTHER DSC MSG** key simultaneously to open the composing screen for the distress relay individual.



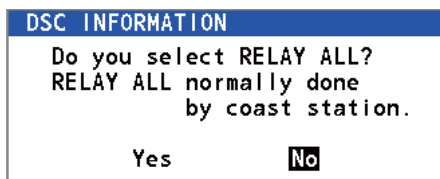
3. DSC DISTRESS OPERATIONS

2. Rotate the **CHANNEL/ENTER** knob to select [MSG TYPE] then push the knob.




RELAY INDIVIDUAL
RELAY ALL

3. Rotate the **CHANNEL/ENTER** knob to select [RELAY ALL] then push the knob. The following message appears.



DSC INFORMATION
Do you select RELAY ALL?
RELAY ALL normally done
by coast station.
Yes **No**

4. Rotate the **CHANNEL/ENTER** knob to select [Yes] then push the knob.
5. With [DISTRESS ID] selected, push the **CHANNEL/ENTER** knob.
6. Rotate the **CHANNEL/ENTER** knob to select [DIRECT INPUT] or [NO INFO] then push the knob. For [DIRECT INPUT], go to step 7. For [NO INFO], go to step 8.
7. Enter the ID (MMSI) of the ship in distress with the numeric keys then push the **CHANNEL/ENTER** knob.
8. With [NATURE] selected, push the **CHANNEL/ENTER** knob.
9. Rotate the **CHANNEL/ENTER** knob to select the nature of distress then push the knob.
10. With [LAT] and [LON/UTC] selected, push the **CHANNEL/ENTER** knob.



EPFS
MANUAL
NO INFO

11. Rotate the **CHANNEL/ENTER** knob to select [EPFS], [MANUAL] or [NO INFO] then push the knob. For [MANUAL], go to step 12. For others, go to step 13.
12. Use the numeric keys to enter latitude and longitude of the ship in distress. (If necessary, switch coordinates: **1** key to switch to North (East); **2** key to switch to South (West).) Push the **CHANNEL/ENTER** knob. Also, enter the UTC time then push the **CHANNEL/ENTER** knob.
13. With [GO TO CALL] selected, push the **CHANNEL/ENTER** knob. The distress relay is transmitted to all ships.