

9-2. When "No response! Try calling again?" is displayed, do one of the following:

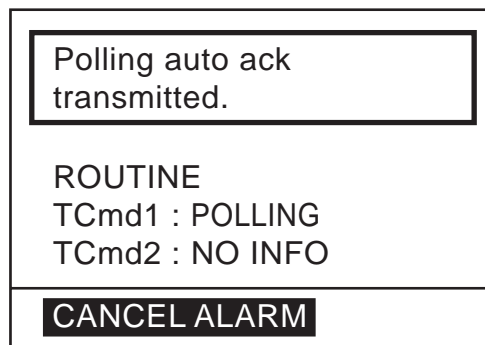
Re-send call: Push the **ENT** key followed by the **CALL** key.

Cancel call: Press the **CANCEL** key to return to the standby display.

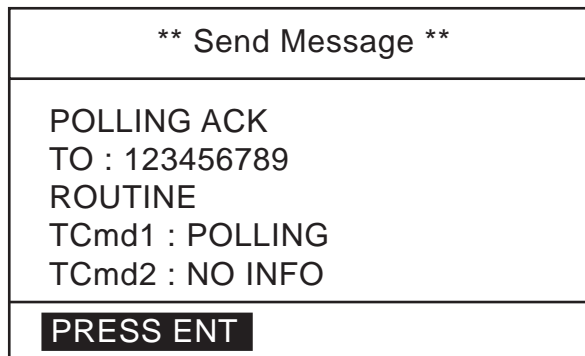
3.7.2 Receiving a polling call

Automatic reply

1. When a polling request is received and the equipment is set up for automatic acknowledge POLLING on the AUTO ACK menu is ON and the **ACK** key is set to show AUTO ACK on the display, the display changes as shown in the illustration below and the audio alarm sounds.



2. Press the **CANCEL** or **ENT** key to silence the alarm. The display changes as below.



3. DSC OPERATION FOR NON-DISTRESS CASES

Manual reply

1. When a polling request call is received and the setting of POLLING CALL on the system setup menu is OFF, the display changes as shown in the illustration below and the audio alarm sounds.

Position request call received.
FROM : 123456789 ROUTINE TCmd1 : POLLING TCmd2 : NO INFO
CANCEL ALARM

2. Press the **CANCEL** key to silence the alarm. The display changes as below.

** Received Message **
APR01/ 04 12 : 34 ECC : OK POLLING CALL FROM : 123456789 ROUTINE TCmd1 : POLLING TCmd2 : NO INFO
PRESS ENT TO ACK.

3. To respond to the call, press the **ENT** key. The following pop-up window appears.

ANSWER NO ANSWER

4. Choose ANSWER by the **CH** knob and press the **CALL** key to send the polling acknowledge call. Then the standby display appears.
To send no reply, choose NO ANSWER and press the **ENT** key twice to return to the standby display.

3.8 Neutral Craft Call

The neutral craft call, which contains own ship position and ID, informs all ships that your ship is not a participant in armed conflict. Send the call BEFORE entering an area of armed conflict.

3.8.1 Sending a neutral craft call

1. Press the **CALL** key. The display changes from the standby display to the COMPOSE MESSAGE screen and the CALL TYPE is displayed in reverse video.
2. Press the **ENT** key to open the call type list.
3. Rotate the **CH** knob (or press up / down arrow key) to choose NEUTRAL and press the **ENT** key.

** Compose Message **
CALL TYPE : NEUTRAL CRAFT URGENCY TCmd1 : SIMPLEX TP TCmd2 : NEUTRAL CRAFT CH : 16

6. URGENCY is selected; press the **ENT** key.
7. Choose SAFETY, or URGENCY as appropriate followed by pressing the **ENT** key.
8. Press the **CALL** key more than three seconds to transmit the call. After the call is transmitted, the standby display appears.

3.8.2 Receiving a neutral craft call

1. When a neutral craft call is received, the alarm sounds and the display changes as below.

Neutral craft call received.
FROM : 123456789 URGENCY TCmd1 : SIMPLEX TP TCmd2 : NEUTRAL CRAFT CH : 16
CANCEL ALARM

3. DSC OPERATION FOR NON-DISTRESS CASES

2. Press the **CANCEL** or **ENT** key. The audible alarm is silenced and the display changes as below.

** Received Message **
APR01/ 04 12 : 34 ECC : OK NEUTRAL CALL FROM : 123456789 SAFETY TCmd1 : SIMPLEX TP TCmd2 : NEUTRAL CRAFT CH : 16
PRESS ENT TO CHANGE CH

3. Press the **ENT** key. The display changes to the standby display, indicating CH16.

3.9 Medical Transport Call

The medical transport call informs all ships, by urgency priority, that own ship carries medical supplies.

3.9.1 Sending a medical transport call

1. Press the **CALL** key. The display changes from the standby display to the COMPOSE MESSAGE screen and the CALL TYPE is displayed in reverse video.
2. Press the **ENT** key to open the call type list.
3. Rotate the **CH** knob (or press up / down arrow key) to choose the MEDICAL and press the **ENT** key.

** Compose Message **
CALL TYPE : MEDICAL TRANSPORT URGENCY TCmd1 : SIMPLEX TP TCmd2 : MEDICAL TRSPRT CH : 16

4. Press the **CALL** key more than three seconds to transmit the call. After the call is transmitted, the standby display appears, with CH16 selected.

3.9.2 Receiving a medical transport call

1. When a medical call is received, the alarm sounds and the display changes as below.

Medical call received.
FROM : 123456789 URGENCY TCmd1 : SIMPLEX TP TCmd2 : MEDICAL CH : 16
CANCEL ALARM

2. Press the **CANCEL** or **ENT** key. The audible alarm stops and the display changes as below.

** Received Message **
APR01/ 04 12 : 34 ECC : OK MEDICAL CALL FROM : 123456789 URGENCY TCmd1 : SIMPLEX TP TCmd2 : MEDICAL CH : 16
PRESS ENT TO CHANGE CH

3. Press the **ENT** key. The display changes to the standby display, indicating CH16.

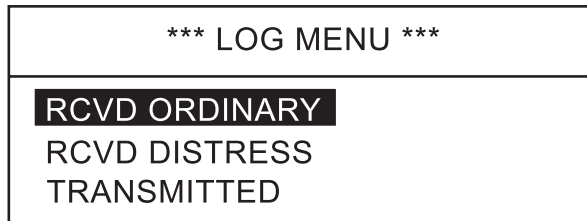
3.10 Log File

Three log files are provided for storage of calls: received ordinary log, received distress log and transmitted log. Each log file stores 50 calls, on a first-in, first-out basis. This means that the latest call is saved as log no.1 and the log no. of all previous calls in that log increments by one. When the storage capacity is exceeded, the oldest call is deleted to make room for the latest. A letter mark shows unread or unacknowledged calls. Received distress calls are automatically deleted 48 hours after being read.

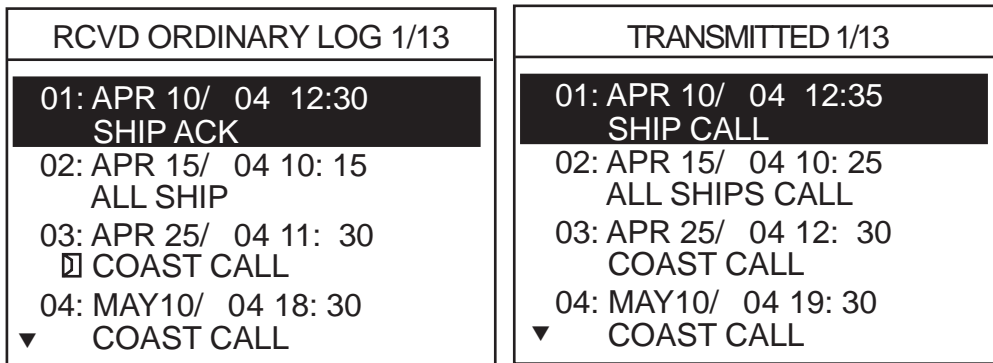
Opening a log file

The procedure for opening a log is common to all logs.

1. Press the **LOG** key to open the SELECT LOG FILE display.



2. Rotate the **CH** knob to choose RCVD ORDINARY, RCVD DISTRESS or TRANSMITTED as appropriate and press the **ENT** key. For example, choose RCVD ORDINARY or TRANSMITTED.



3. Rotate the **CH** knob to choose a file you wish to browse.
The in the RCVD ORDINARY LOG indicates unread or unacknowledged message.

4. Press the **ENT** key to open the message. Below is a sample message.

** Received Message **	
APR 10/04 18:30 ECC : OK SHIP CALL FROM : 123456789 ROUTINE TCmd1 : SIMPLEX TP TCmd2 : NO INFO CH : 16	
DELETE	▲ ▼ ANSWER

For a received message which requires a reply, ANSWER is displayed (for 4.5 minutes) . To reply choose it and press the **ENT** key.

5. Press ▲ or ▼ key to open previous or next page on the log.
6. If you wish to print the file selected, press the **PRINT** key.
7. If you wish to delete the file selected, choose DELETE and press the **ENT** key.
The following confirmation window appears.

DELETE RECEIVED LOG ARE YOU SURE? YES NO

8. Choose YES and press the **ENT** key.

3. DSC OPERATION FOR NON-DISTRESS CASES

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4. BASIC SETUP

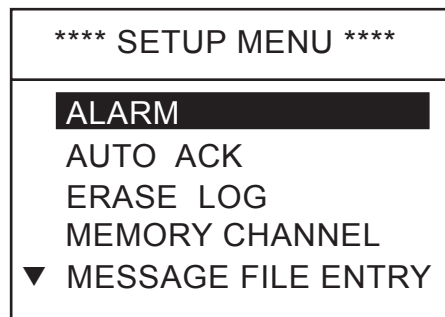
4.1 Alarm Setup

This section provides the procedures for setting up various alarms. The alarm menu enables/disables internal and external alarms. Note that the Distress/Urgency alarm cannot be disabled.

Old position alarm in manual position entry mode

This alerts the operator when manually entered position data is older by the number of hours or minutes set.

1. Press the **MENU** key.



SETUP MENU on transceiver unit

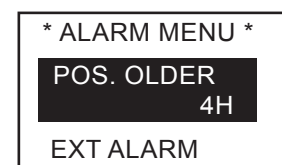


SETUP MENU on remote handset

2. ALARM is selected; press the **ENT** key to display the ALARM menu.

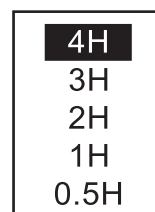


ALARM MENU on transceiver unit



ALARM MENU on remote handset

3. Rotate the **CH** knob (or press up / down arrow key) to choose POSITION OLDER (POS. OLDER for remote handset) from the ALARM MENU and press the **ENT** key. The following setting window appears.



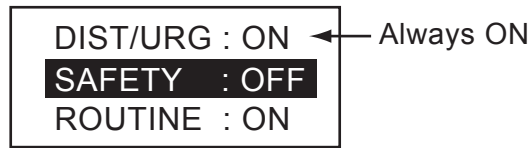
4. Rotate the **CH** knob (or press up / down arrow key) to choose an appropriate value and press the **ENT** key.

Alarm is output when position is older by the number of hours set here.

5. Press the **CANCEL** key twice to return to the standby display.

To set type of alarm to output

1. Rotate the **CH** knob (or press up / down arrow key) to choose EXT ALARM from the ALARM MENU and press the **ENT** key. The following setting window appears.



2. Rotate the **CH** knob (or press up / down arrow key) to choose an appropriate option. Alarm is output to external device.
DSTRS/URG: Distress or urgency call output upon receipt.
SAFETY: Safety call output upon receipt.
ROUTINE: Routine call output upon receipt.
3. Press the **ENT** key.
4. Choose ON or OFF as appropriate and press the **ENT** key.
5. Press the **CANCEL** key three times to return to the standby display.
Note that the setting of ROUTINE is turned to ON after turning on the power

4.2 Auto ACK Setup

The Auto Ack Menu enables/disables automatic acknowledgement of ship, coast, position and polling calls.

Comply status Set of [5 ACQ]	ABLE	UNABLE
AUTO ACK	Can send acknowledge automatically.	Can send UNABLE automatically.
MANUAL ACK	Can send acknowledge manually	Can send UNABLE manually.

To set COMPLY TYPE

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose AUTO ACK and press the **ENT** key. The following menu appears.

**** AUTO ACK MENU ****
COMPLY STATUS ABLE
UNABLE REASON
NO REASON
POSITION CALL ON
POLLING CALL ON

3. **COMPLY STATUS** is selected; press the **ENT** key. The following setting window appears.

ABLE
UNABLE

4. Rotate the **CH** knob (or press up / down arrow key) to choose ABLE or UNABLE as automatic acknowledgement reply to each call.
5. Press the **ENT** key.

Note: Automatic acknowledge is automatically disabled when RX call contains error, as required by law. Further, automatic acknowledge is disabled in case of OFF HOOK.

To set reason for unable

If you have chosen UNABLE as the COMPLY STATUS, set the reason as follows:

1. Rotate the **CH** knob (or press up / down arrow key) to choose UNABLE REASON from the AUTO ACK MENU and press the **ENT** key. The following menu appears.



2. Rotate the **CH** knob (or press up / down arrow key) to choose a reason for UNABLE.
3. Press the **ENT** key.

Note: This menu is the same as manual acknowledgement. EQUIPMENT DISABLE is shown in calls when EQUIP DISBLD is selected.

To set position call response

1. Rotate the **CH** knob (or press up / down arrow key) to choose the POSITION CALL from the AUTO ACK MENU and press the **ENT** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose ON or OFF as appropriate.
OFF: Disables automatic acknowledgement of position request.
ON: Enables automatic acknowledgement of position request.
3. Press the **ENT** key.

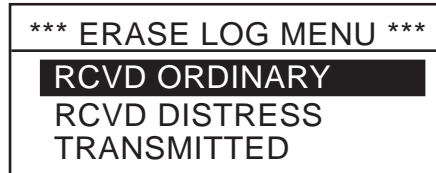
To set polling call response

1. Rotate the **CH** knob (or press up / down arrow key) to choose the POLLING CALL from the AUTO ACK MENU and press the **ENT** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose ON or OFF as appropriate.
OFF: Disables automatic acknowledgement of polling request.
ON: Enables automatic acknowledgement of polling request.
3. Press the **ENT** key.

4.3 Erasing Logs

Erasing received ordinary log

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose the ERASE LOG and press the **ENT** key. The following window appears.



3. RCVD ORDINARY is selected; press the **ENT** key to erase the received ordinary log.
4. Choose YES and press the **ENT** key to erase the received ordinary log.

Erasing received distress log

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose ERASE LOG and press the **ENT** key.
3. Rotate the **CH** knob (or press up / down arrow key) to choose RCVD DISTRESS and press the **ENT** key to erase the received distress log.
4. Choose YES and press the **ENT** key to erase the received distress log.

Erasing transmitted log

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose ERASE LOG and press the **ENT** key.
3. Rotate the **CH** knob (or press up / down arrow key) to choose TRANSMITTED and press the **ENT** key.

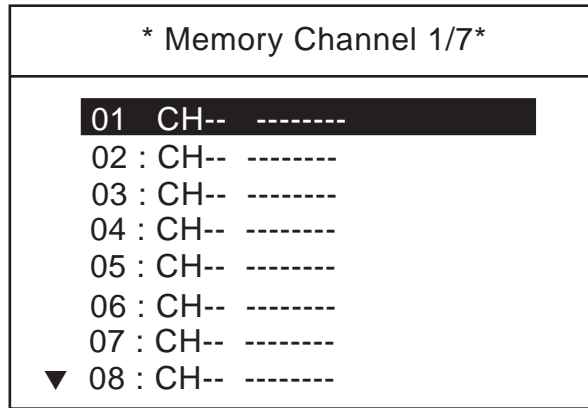


4. Choose YES and press the **ENT** key to erase the transmitted message log.

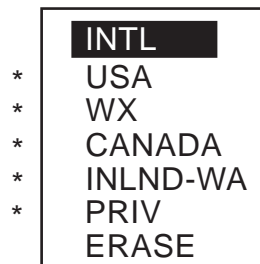
4.4 Memory Channel Setup

You can save up to 50 channels as follows.

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose MEMORY CHANNEL and press the **ENT** key.



3. Rotate the **CH** knob (or press up / down arrow key) to choose a vacant CH number and press the **ENT** key.



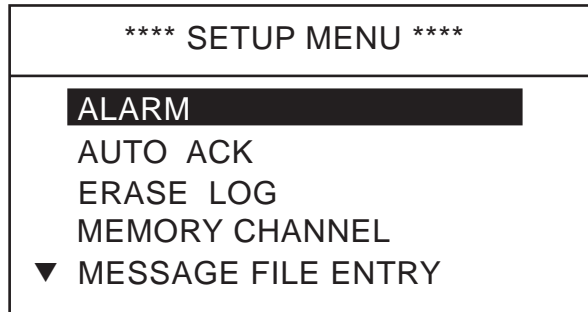
* : Only permitted channel modes are displayed, which are set by the installer of the equipment.

4. Rotate the **CH** knob (or press up / down arrow key) to choose appropriate channel type and press the **ENT** key.
5. Rotate the **CH** knob (or press up / down arrow key) to choose channel number and press the **ENT** key.

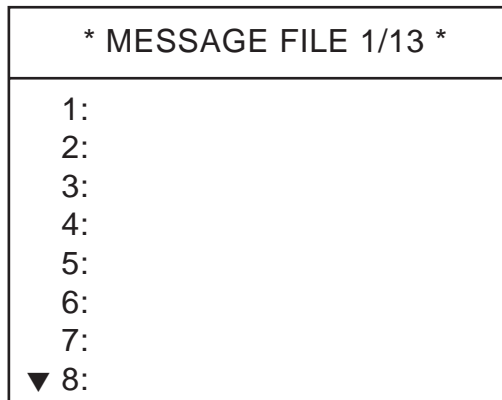
4.5 Message File Entry

In this section you will learn how to prepare and store ship, coast, PSTN, group, and area calls for future transmission. 100 calls can be stored.

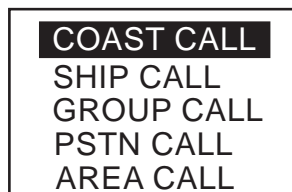
1. At the standby display, press the **MENU** key to open the SETUP MENU.



2. Rotate the **CH** knob (or press up / down arrow key) to choose MESSAGE FILE ENTRY and press the **ENT** key.



3. Rotate the **CH** knob to choose a vacant number and press the **ENT** key. The following selection window appears.



4. BASIC SETUP

4. Rotate the **CH** knob to choose the call type and press the **ENT** key. One of the following display appears depending on the call type selected above.

MESSAGE FILE 1 ENTRY	
CALL TYPE	: COAST CALL
COAST ID	: 00
ROUTINE	
TCmd1	: SIMPLEX TP
TCmd2	: NO INFO
CH	: 16
NAME	:
REGIST ERASE	

In case of Coast call

MESSAGE FILE 1 ENTRY	
CALL TYPE	: SHIP CALL
SHIP ID	:
ROUTINE	
TCmd1	: SIMPLEX TP
TCmd2	: NO INFO
CH	: 16
NAME	:
REGIST ERASE	

In case of Ship call

MESSAGE FILE 1 ENTRY	
CALL TYPE	: GROUP CALL
GROUP ID	: 0
ROUTINE	
TCmd1	: SIMPLEX TP
TCmd2	: NO INFO
CH	: 16
NAME	:
REGIST ERASE	

In case of Group call (Note3)

MESSAGE FILE 1 ENTRY	
CALL TYPE	: PSTN CALL
COAST ID	: 00
TCmd1	: DUPLEX TP
TCmd2	: NO INFO
TEL	:
NAME	:
REGIST ERASE	

In case of PSTN call

MESSAGE FILE 1 ENTRY	
CALL TYPE	: AREA CALL
AREA	: --°----°-↓--°→--°
ROUTINE	
TCmd1	: SIMPLEX TP
TCmd2	: NO INFO
CH	: 16
NAME	:
REGIST ERASE	

In case of Area call

Note1: The communication priority is ROUTINE only.

Note2: The group ID will be registered automatically after a group call message file is saved.

Note3: If you register a group call, its group ID becomes your own group ID.

5. Press the **ENT** key and key in each ID or AREA followed by the **ENT** key.
To enter area

1: N/E	2: S/W
--° N	---° E ↓ --° → --°

- Enter latitude (degrees) and 1 for north or 2 for south of reference point.
 - Enter longitude (degrees) and 1 for east or 2 for west.
 - Enter southerly degrees of area.
 - Enter easterly degrees of area.
 - Press the **ENT** key.
6. TCmd1 is selected; press the **ENT** key.

SIMPLEX TP
DUPLEX TP
DATA
FAX

7. Choose SIMPLEX TP, DUPLEX TP, DATA or FAX as appropriate followed by pressing the **ENT** key. If you chose SIMPLEX, DUPLEX, or FAX, NO INFO appears in the Tcmd2 field. Go to step 10. If you chose DATA, go to the next step.
8. Tcmd2 is selected; press the **ENT** key.

V. 21	▲ V. 26 ter
V. 22	V. 27 ter
V. 22 bis	V. 32
V. 23	
▼ V. 26 bis	

9. Choose an appropriate data type and press the **ENT** key.
10. Choose CH and press the **ENT** key. The following window appears.

SELECT CH
NO INFO

11. Choose SELECT CH with the **CH** knob (or up / down arrow key) and press the **ENT** key.

SIMP CHANNEL		
06	15	73
08	16	74
09	17	75
10	67	76
11	68	77
12	69	87
13	71	88
14	72	

In case of NO INFO, there is no channel information.

4. BASIC SETUP

12. Choose a channel with the **CH** knob (or up / down arrow key) and press the **ENT** key.
13. Press the **ENT** key to open the name entry window.
14. Enter a name with the alphanumeric keys. To change a digit, rotate the **CH** knob. Press the **ENT** key.

MESSAGE FILE 1 ENTRY	
CALL TYPE	: COAST CALL
COAST ID	: 0012345678
ROUTINE	
TCmd1	: SIMPLEX TP
TCmd2	: NO INFO
CH	: 12
NAME	: ABCD
REGIST	ERASE

In case of Coast call

15. **REGIST** is selected; press the **ENT** key to register. To erase, rotate the **CH** knob to select **ERASE** and press the **ENT** key.

To send a message file:

Method1

- 1) Press the **CALL** key.
- 2) Choose call type and press the **ENT** key.
- 3) Highlighting xxx ID, press the **FILE** key to display list of message files.
- 4) Choose file to send and press the **ENT** key..
- 5) Set the Routine, TCmd1, TCmd2 and CH.
- 6) Press the **CALL** key more than three seconds.

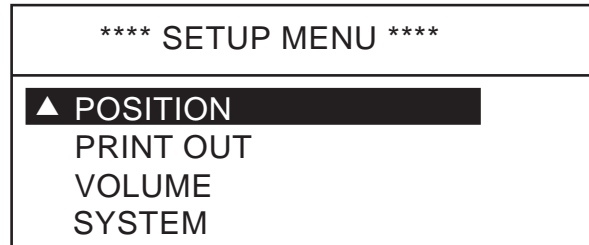
Method2

- 1) Press the **FILE** key at the standby display.
- 2) Choose a file you want to send and press the **ENT** key.
- 3) Press the **CALL** key more than three seconds.

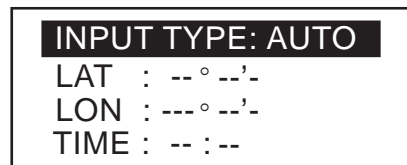
4.6 Position Setup

This is where you enter your position, automatically or manually.

1. Press the **MENU** key at the standby display.
2. Rotate the **CH** knob (or press up / down arrow key) to choose POSITION from the second page of the main menu.



3. Press the **ENT** key. The following menu appears.



4. INPUT TYPE is selected; press the **ENT** key. The following setting window appears.



Note: If the position data from a positioning sensor is available, MANUAL can not be chosen, i.e. the above window does not open.

5. Rotate the **CH** knob (or press up / down arrow key) to choose AUTO or MANUAL as appropriate and press the **ENT** key.

If you chose AUTO, your ship's position and time appear; press the **CANCEL** to close the menu and return to the standby display. These data are supplied from the navigation equipment connected.

Note: • If correct position data is entered from a position source during the setting of MANUAL, the setting changes automatically to AUTO from MANUAL.

- If the message "GPS ERR" appears after you change INPUT TYPE from MANUAL to AUTO, confirm that the navigation device is functioning.

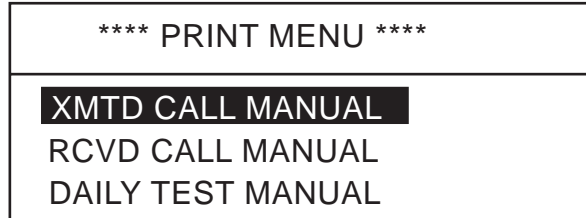
If you chose MANUAL, enter your position and time as follows.

6. Enter latitude (in four digits) with the numeric keys. If necessary, switch coordinates: **1** key to switch to North; **2** key to switch to South.
7. Press the **ENT** key and enter longitude (in five digits) with the numeric keys. If necessary, switch coordinates: **1** key to switch to East; **2** key to switch to West.
8. Press the **ENT** key and enter UTC time with the numeric keys.
9. Press the **ENT** key and **CANCEL** key to finish.

4.7 Print Out Setup

The PRINT MENU enables/disables automatic printing of all transmitted and received calls and the results of the daily test.

1. Press the **MENU** key at the standby display to open menu.
2. Rotate the **CH** knob (or press up / down arrow key) to choose PRINT OUT from the second page of the main menu and press the **ENT** key.



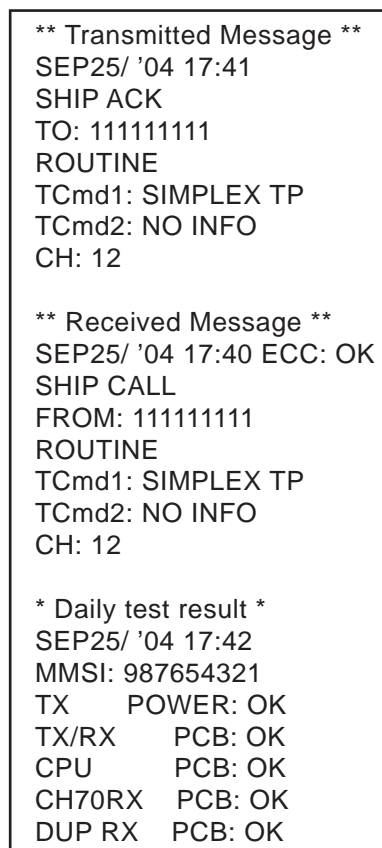
3. Choose appropriate item among XMTD CALL MANUAL, RCVD CALL MANUAL or DAILY TEST MANUAL and press the **ENT** key.



4. Choose AUTO or MANUAL as appropriate and press the **ENT** key.
5. Press the **CANCEL** key twice to return to the standby display.

In the AUTO, when a message is received, its message automatically is printed out. In the MANUAL, open a message you want to print and press the **PRINT** key (see page 3-32).

Note: In the AUTO, you can print a message as same as Manual.



Sample printout

4.8 Volume Setup

The VOLUME menu enables/disables key beep (acknowledges correct key input) and adjusts the volume of the earpiece, intercom and off-hook loudspeaker.

1. Press the **MENU** key at the standby display.
2. Rotate the **CH** knob (or press up / down arrow key) to choose VOLUME and press the **ENT** key.

**** VOLUME MENU ****	
KEY CLICK	8
EARPIECE LEVEL	9
INTERCOM VOLUME	8
OFF HOOK SPKR	ON

Follow the appropriate procedure to adjust volume of desired item.

Key click

1. Choose KEY CLICK, and press the **ENT** key.

KEY CLICK LEVEL SETUP	KEY CLICK LEVEL SETUP
LEVEL (0-16)	LEVEL (0-16)
< ■■■■■ >	< ■■■ > 4
EXT: ENT	EXT: ENT

Note: Do not confuse keyboard beep (single beep) with ACK beep (three beeps).

2. Rotate the **CH** knob (or press up / down arrow key) to set the key click level. The setting range is 0 to 16.
3. Press the **ENT** key. (If you press the **CANCEL** key, the setting is not stored.)

Earpiece volume

1. Choose ERAPIECE LEVEL and press the **ENT** key.

EARPIECE LEVEL SETUP	EARPIECE LEVEL SETUP
LEVEL (8-16)	LEVEL (1-4)
< ■■■■■ >	< ■■ > 2
EXT: ENT	EXT: ENT

Transceiver unit

Remote handset

2. Rotate the **CH** knob (or press up / down arrow key) to set the earpiece volume level. The setting range is 8 to 16 for transceiver handset and 1 to 4 for remote handset.
3. Press the **ENT** key. (If you press the **CANCEL** key, the setting is not stored.)

4. BASIC SETUP

Intercom volume

1. Choose INTERCOM VOLUME and press the **ENT** key.

INTERCOM SETUP	
LEVEL (1-16)	
< ■■■■	> 8
EXT: ENT	

2. Rotate the **CH** knob (or press up / down arrow key) to set the intercom volume level. The setting range is 1 to 16.
3. Press the **ENT** key.

Off-hook loudspeaker

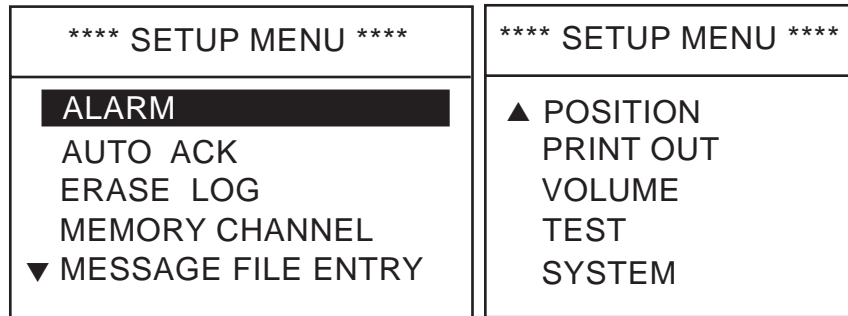
You can set the loudspeaker(s) (internal and external) on or off, according to off-hook condition.

1. Choose OFFHOOK SPKR and press the **ENT** key.
2. Choose ON or OFF and press the **ENT** key.
 - OFFHOOK SPKR ON: Loudspeaker(s) is activated when off-hook.
 - OFFHOOK SPKR OFF: Loudspeaker(s) is deactivated when off-hook.

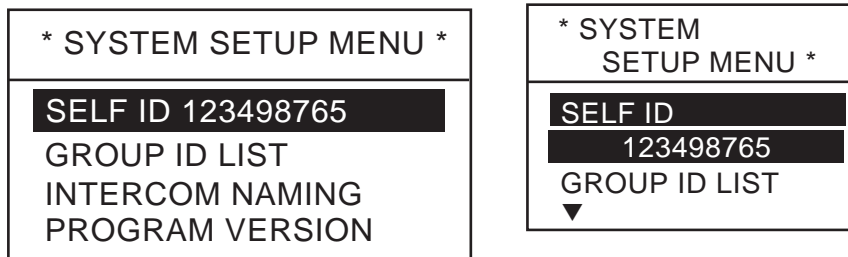
5. SYSTEM SETUP

5.1 Displaying Self ID

1. Press the **MENU** key.



2. Rotate the **CH** knob (or press up / down arrow key) to choose SYSTEM from page 2 of the menu and press the **ENT** key. The following window appears. The self ID is displayed on the first line.

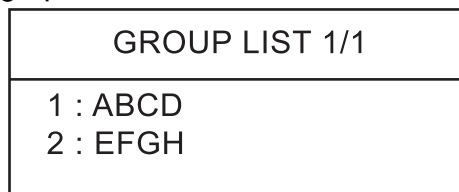


Transceiver unit

Remote handset

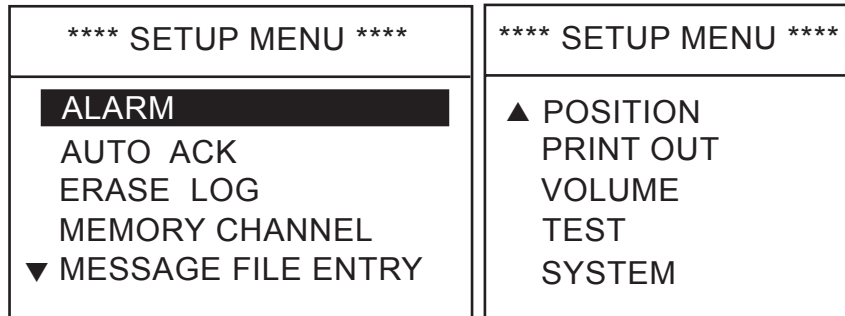
5.2 Displaying Group ID List

1. Press the **MENU** key.
2. Rotate the **CH** knob (or press up / down arrow key) to choose SYSTEM from page 2 of the menu and press the **ENT** key.
3. Rotate the **CH** knob (or press up / down arrow key) to choose GROUP ID LIST and press the **ENT** key to show the GROUP ID list. For how to registers group IDs, see paragraph 4.5.

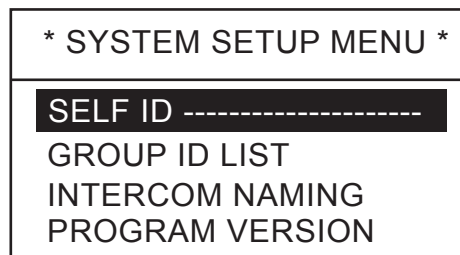


5.3 Naming Intercom

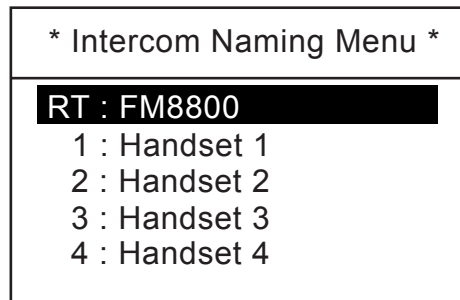
1. Press the **MENU** key.



2. Rotate the **CH** knob (or press up / down arrow key) to choose SYSTEM from page 2 of the menu and press the **ENT** key. The following window appears.



3. Rotate the **CH** knob (or press up / down arrow key) to choose INTERCOM NAMING and press the **ENT** key. The following window appears.



4. Rotate the **CH** knob (or press up / down arrow key) to choose a handset number and press the **ENT** key.
5. Key in remote station name with alphanumeric keys and press the **ENT** key.
6. Repeat steps 4 and 5 to name other handsets.

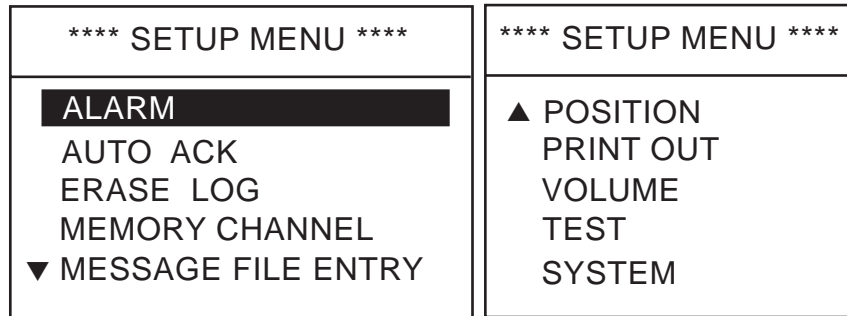
To change the default name, for example, "1: Handset 1", rotate the CH knob to move the cursor to right of "1".

1: Handset 1__
↑

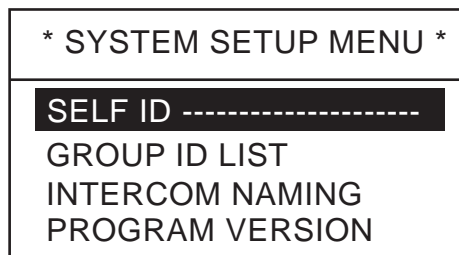
Move cursor here. And then press the ▼ key to delete the characters.
Enter a new name for the remote station.

5.4 Displaying Program Version

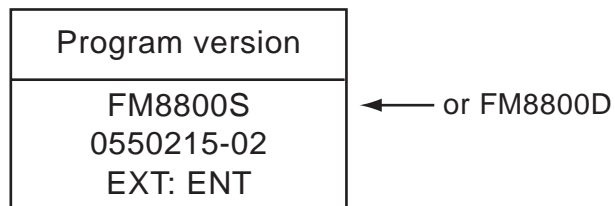
1. Press the **MENU** key.



2. Rotate the **CH** knob to choose **SYSTEM** and press the **ENT** key. The following selection window appears.



3. Rotate the **CH** knob to choose **PROGRAM VERSION** and press the **ENT** key to show program version number.

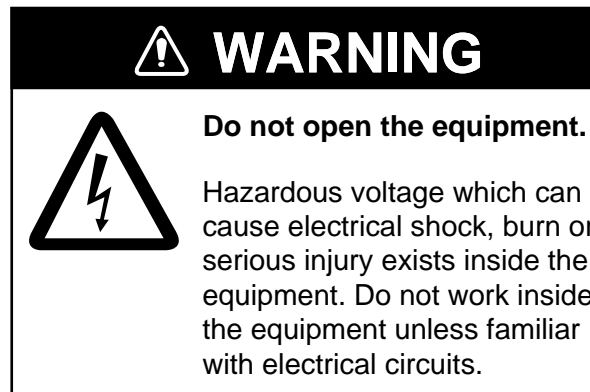


Program version

4. Press the **ENT** key to exit.

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6. MAINTENANCE & TROUBLESHOOTING



6.1 Maintenance

Periodic checks

- 1) Check that each connector is firmly connected.
- 2) Clean corroded or soiled connectors.
- 3) Check coaxial cable for damage. If damaged, replace.
- 4) Check that bolts fixing the antenna are firmly tightened.

6.2 Troubleshooting

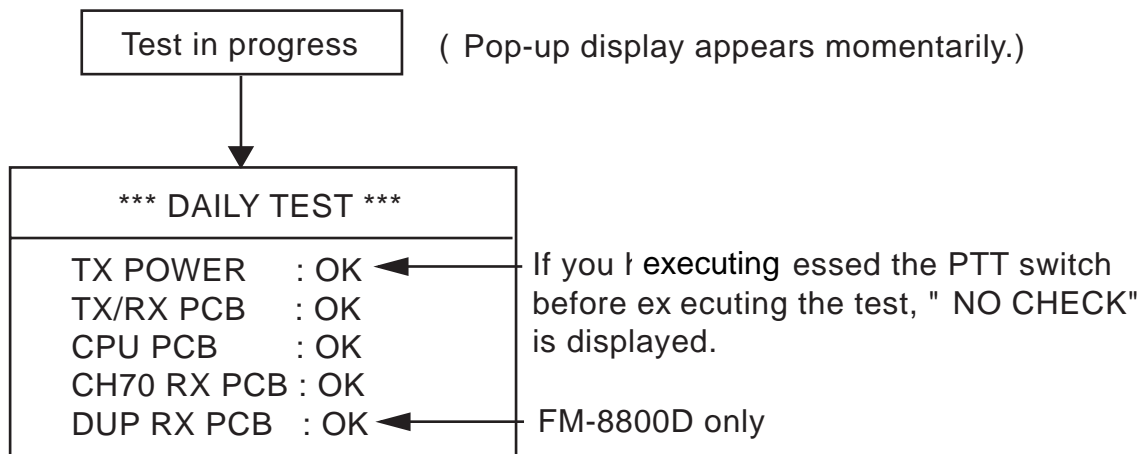
When the power cannot be turned on

- 1) Check if power plug is firmly connected.
- 2) Check fuses in the power cable. If it has tripped, replace it with a new one (15A).
- 3) If power cannot be turned on (after checking 1 and 2), contact a FURUNO agent or representative for advice.

6.3 Daily Test

Authorities require that the DSC be checked daily for proper operation to ensure that it will function properly in the event of distress. Execute the daily test as below.

1. At the standby display, press the **SHIFT** key and **TEST** key in that order. The following display appears for test. And distress alarm (visual and audible) occurs.



Result of daily test

2. To stop ALARM, press the **CANCEL** key.
3. To stop the daily test, press the **CANCEL** key.

“NG” may be displayed depending on the receiving conditions, In this case, repeat the daily test a couple of times. If NG is displayed always, contact a FURUNO agent or representative for advice.

The table below shows the abnormal indications and causes shown in the daily test.

Indication	Cause
TX POWER: NG	Indicates no transmitting output power. PA module or TX/RX pcb 05P0774 may be damaged.
TX/RX PCB: NG	Indicates abnormal PLL circuit in the TX/RX pcb. TX/RX pcb 05P0774 may be damaged.
CPU PCB: NG	Indicates abnormal loop circuit inside the CPU board. CPU pcb 05P0773 may be damaged.
CH70 RX PCB: NG	Indicates abnormal loop circuit between CPU and CH70 RX pcb. CH70 RX pcb 05P0775 may be damaged.
DUP RX PCB: NG	Indicates abnormal PLL circuit in the DUP RX pcb. DUP RX pcb 05P0777 may be damaged.

If necessary, refer to Parts Location on subsequent pages.

6.4 Error Message

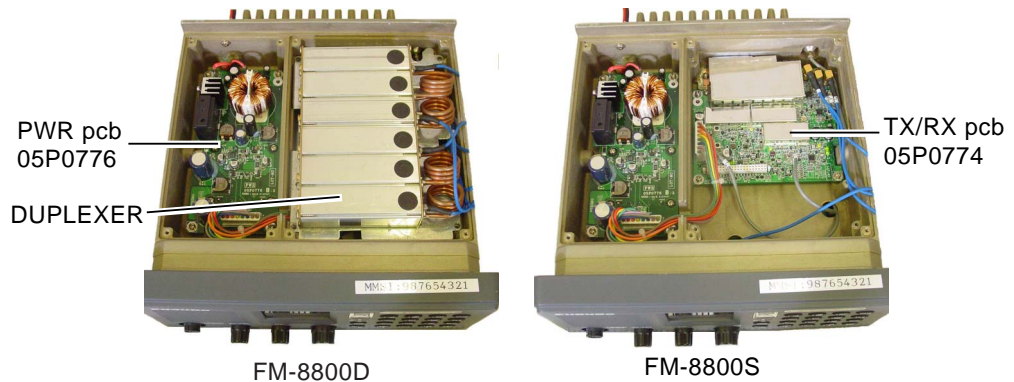
The table below shows all the error messages which may appear.

Error message	Meaning
PLL1 Unlock	PLL circuit on the TX/RX pcb 05P0774 has unlocked.
PLL2 Unlock	PLL circuit on the DUP RX pcb 05P0777 has unlocked (only FM-8800D).
ANT ERROR	The antenna is abnormal. In this condition, if the transmission continues more than five seconds, the output power is reduced to approximately 10W.
GPS ERROR	There is no L/L input from a positioning sensor for more than one minute.
System Error	The DSP (digital signal processor) is abnormally.
Printer PE	Printer is disconnected or paper runs out.

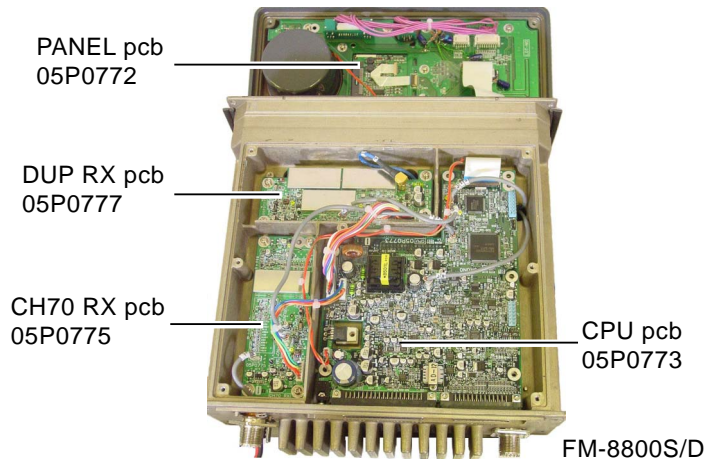
Note: If the CPU is abnormal, the beep sounds continuously until turning off the power.

6.5 Parts Location

Transceiver unit FM-8800D/8800S

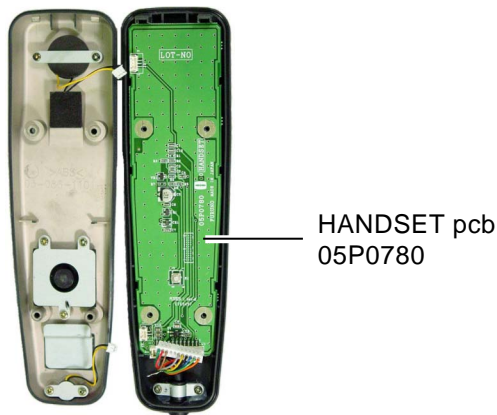


Top cover removed

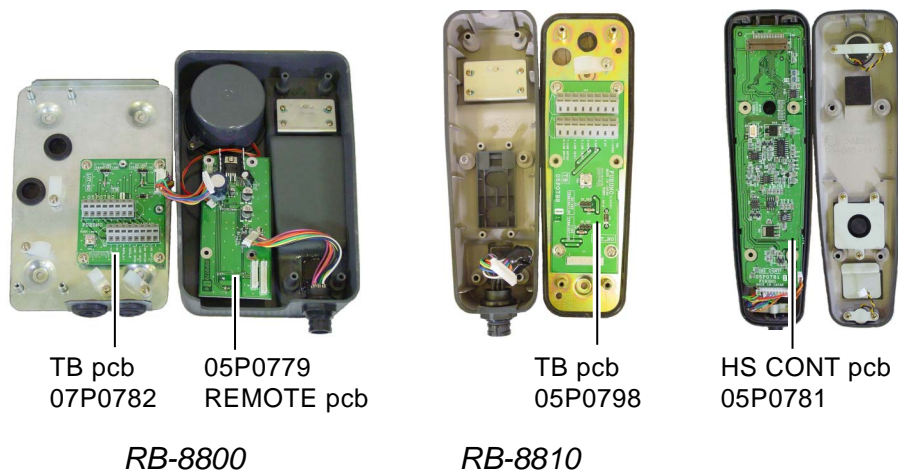


Bottom cover removed

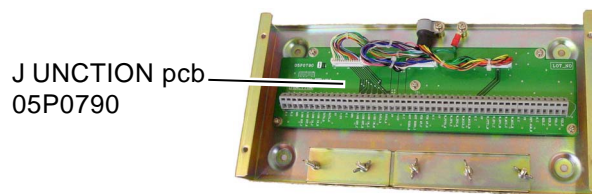
Handset HS-2003



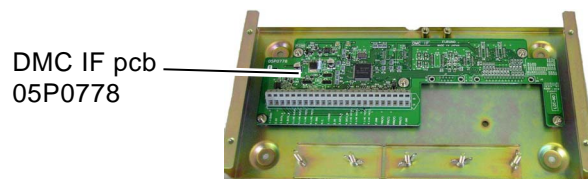
Remote station RB-8800/RB-8810



Junction box IF-8810



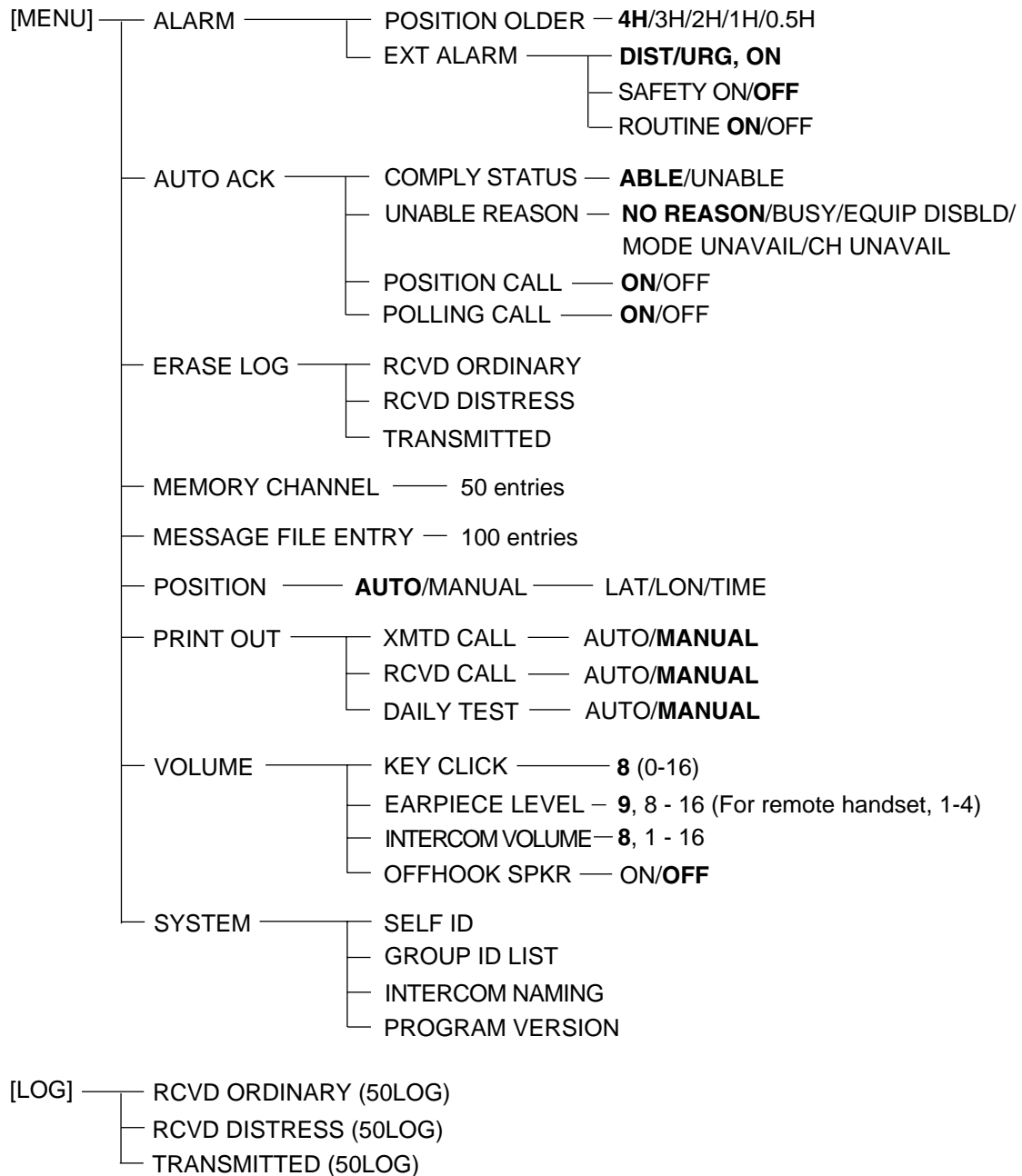
DMC Interface IF-8820



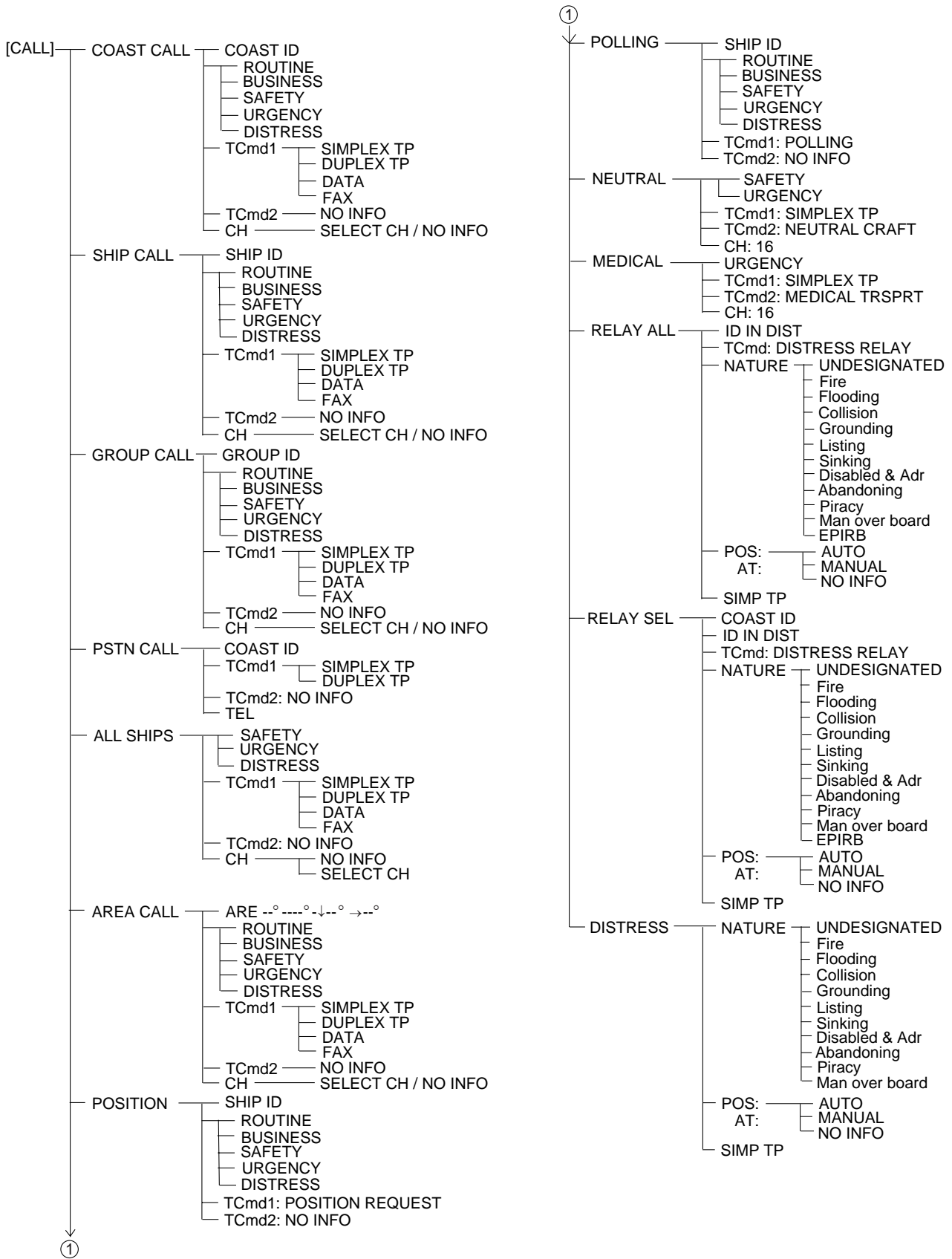
APPENDIX

Menu Tree

Bold: Default



APPENDIX



Marine VHF Channel Lists

1) International Channels

CH	TX MHz	RX MHz	Remark	CH	TX MHz	RX MHz	Remark
01	156.050	160.650		60	156.025	160.625	
02	156.100	160.700		61	156.075	160.675	
03	156.150	160.750		62	156.125	160.725	
04	156.200	160.800		63	156.175	160.775	
05	156.250	160.850		64	156.225	160.825	
06	156.300	156.300		65	156.275	160.875	
07	156.350	160.950		66	156.325	160.925	
08	156.400	156.400		67	156.375	156.375	
09	156.450	156.450		68	156.425	156.425	
10	156.500	156.500		69	156.475	156.475	
11	156.550	156.550		70	-	156.525	DSC
12	156.600	156.600		71	156.575	156.575	
13	156.650	156.650		72	156.625	156.625	
14	156.700	156.700		73	156.675	156.675	
15	156.750	156.750	Low PWR	74	156.725	156.725	
16	156.800	156.800		75	156.775	156.775	Low PWR
17	156.850	156.850	Low PWR	76	156.825	156.825	Low PWR
18	156.900	161.500		77	156.875	156.875	
19	156.950	161.550		78	156.925	161.525	
20	157.000	161.600		79	156.975	161.575	
21	157.050	161.650		80	157.025	161.625	
22	157.100	161.700		81	157.075	161.675	
23	157.150	161.750		82	157.125	161.725	
24	157.200	161.800		83	157.175	161.775	
25	157.250	161.850		84	157.225	161.825	
26	157.300	161.900		85	157.275	161.875	
27	157.350	161.950		86	157.325	161.925	
28	157.400	162.000		87	157.375	157.375	
				88	157.425	157.425	

APPENDIX

2) USA Channels

CH	TX MHz	RX MHz	Remark	CH	TX MHz	RX MHz	Remark
01	156.050	156.050		60	-	-	
02	-	-		61	-	-	
03	-	-		62	-	-	
04	-	-		63	156.175	156.175	
05	156.250	156.250		64	-	-	
06	156.300	156.300		65	156.275	156.275	
07	156.350	156.350		66	156.325	156.325	
08	156.400	156.400		67	156.375	156.375	Low PWR
09	156.450	156.450		68	156.425	156.425	
10	156.500	156.500		69	156.475	156.475	
11	156.550	156.550		70	-	156.525	DSC
12	156.600	156.600		71	156.575	156.575	
13	156.650	156.650	Low PWR	72	156.625	156.625	
14	156.700	156.700		73	156.675	156.675	
15	-	156.750		74	156.725	156.725	
16	156.800	156.800		75	-	-	
17	156.850	156.850	Low PWR	76	-	-	
18	156.900	156.900		77	156.875	156.875	Low PWR
19	156.950	156.950		78	156.925	156.925	
20	157.000	157.000		79	156.975	156.975	
21	157.050	157.050		80	157.025	157.025	
22	157.100	157.100		81	157.075	157.075	
23	157.150	157.150		82	157.125	157.125	
24	157.200	161.800		83	157.175	157.175	
25	157.250	161.850		84	157.225	161.825	
26	157.300	161.900		85	157.275	161.875	
27	157.350	161.950		86	157.325	161.925	
28	157.400	162.000		87	157.375	157.375	
				88	157.425	157.425	

US Weather Channels

WX	RX MHz	WX	RX MHz
01	162.550	06	162.500
02	162.400	07	162.525
03	162.475	08	161.650
04	162.425	09	161.775
05	162.450	10	163.275

3) Canadian Channels

CH	TX MHz	RX MHz	Remark	CH	TX MHz	RX MHz	Remark
01	156.050	160.650		60	156.025	160.625	
02	156.100	160.700		61	156.075	156.075	
03	156.150	160.750		62	156.125	156.125	
04	156.200	156.200		63			
05	156.250	156.250		64	156.225	156.225	
06	156.300	156.300		65	156.275	156.275	Low PWR
07	156.350	156.350		66	156.325	156.325	
08	156.400	156.400		67	156.375	156.375	
09	156.450	156.450		68	156.425	156.425	
10	156.500	156.500		69	156.475	156.475	
11	156.550	156.550		70	-	156.525	DSC
12	156.600	156.600		71	156.575	156.575	
13	156.650	156.650		72	156.625	156.625	
14	156.700	156.700		73	156.675	156.675	
15	156.750	156.750	Low PWR	74	156.725	156.725	
16	156.800	156.800		75	-	-	
17	156.850	156.850	Low PWR	76	-	-	
18	156.900	156.900		77	156.875	156.875	Low PWR
19	156.950	156.950		78	156.925	156.925	
20	157.000	161.600	Low PWR	79	156.975	156.975	
21	157.050	157.050		80	157.025	157.025	
22	157.100	157.100		81	157.075	157.075	
23	157.150	161.750		82	157.125	157.125	
24	157.200	161.800		83	157.175	157.175	
25	157.250	161.850		84	157.225	161.825	
26	157.300	161.900		85	157.275	161.875	
27	157.350	161.950		86	157.325	161.925	
28	157.400	162.000		87	157.375	157.375	
				88	157.425	157.425	

APPENDIX

4) Inland waterways (INLND-WA) Channels

CH	TX MHz	RX MHz	Remark	CH	TX MHz	RX MHz	Remark
01	156.050	160.650		60	156.025	160.625	
02	156.100	160.700		61	156.075	160.675	
03	156.150	160.750		62	156.125	160.725	
04	156.200	160.800		63	156.175	160.775	
05	156.250	160.850		64	156.225	160.825	
06	156.300	156.300	Low PWR	65	156.275	160.875	
07	156.350	160.950		66	156.325	160.925	
08	156.400	156.400	Low PWR	67	156.375	156.375	
09	156.450	156.450		68	156.425	156.425	
10	156.500	156.500	Low PWR	69	156.475	156.475	
11	156.550	156.550	Low PWR	70	-	156.525	DSC
12	156.600	156.600	Low PWR	71	156.575	156.575	Low PWR
13	156.650	156.650	Low PWR	72	156.625	156.625	Low PWR
14	156.700	156.700	Low PWR	73	156.675	156.675	
15	156.750	156.750	Low PWR	74	156.725	156.725	Low PWR
16	156.800	156.800		75	-	-	
17	156.850	156.850	Low PWR	76	-	-	
18	156.900	161.500		77	156.875	156.875	Low PWR
19	156.950	161.550		78	156.925	161.525	
20	157.000	161.600		79	156.975	161.575	
21	157.050	161.650		80	157.025	161.625	
22	157.100	161.700		81	157.075	161.675	
23	157.150	161.750		82	157.125	161.725	
24	157.200	161.800		83	157.175	161.775	
25	157.250	161.850		84	157.225	161.825	
26	157.300	161.900		85	157.275	161.875	
27	157.350	161.950		86	157.325	161.925	
28	157.400	162.000		87	157.375	157.375	
				88	157.425	157.425	

5) Private Channels

Note: Bold for FM-8800D duplex TX frequencies

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
155.000		155.000	159.600			180	
155.025		155.025	159.625			181	
155.050		155.050	159.650			182	
155.075		155.075	159.675			183	
155.100		155.100	159.700			184	
155.125		155.125	159.725			185	
155.150		155.150	159.750			186	
155.175		155.175	159.775			187	
155.200		155.200	159.800			188	
155.225		155.225	159.825			189	
155.250		155.250	159.850			190	
155.275		155.275	159.875			191	
155.300		155.300	159.900			192	
155.325		155.325	159.925			193	
155.350		155.350	159.950			194	
155.375		155.375	159.975			195	
155.400	155.400	155.400	160.000	155.400		196	
155.425	155.425	155.425	160.025	155.425		197	
155.450	155.450	155.450	160.050	155.450		198	
155.475	155.475	155.475	160.075	155.475		199	
155.500	155.500	155.500	160.100	155.500		120(L1)	
155.525	155.525	155.525	160.125	155.525		121(L2)	
155.550	155.550	155.550	160.150	155.550		122	
155.575	155.575	155.575	160.175	155.575		123	
155.600	155.600	155.600	160.200	155.600		124	
155.625	155.625	155.625	160.225	155.625		125(F1)(P1)	
155.650	155.650	155.650	160.250	155.650		126(L3)	
155.675	155.675	155.675	160.275	155.675		127	
155.700	155.700	155.700	160.300	155.700		128	
155.725	155.725	155.725	160.325	155.725		129	
155.750	155.750	155.750	160.350	155.750		130	
155.775	155.775	155.775	160.375	155.775		131(F2)(P2)	
155.800	155.800	155.800	160.400	155.800		132	
155.825	155.825	155.825	160.425	155.825		133(F3)(P3)	
155.850	155.850	155.850	160.450	155.850		134	
155.875	155.875	155.875	160.475	155.875		135	
155.900	155.900	155.900	160.500	155.900		136	
155.925	155.925	155.925	160.525	155.925		137	
155.950	155.950	155.950	160.550	155.950		138	

- Continued -

APPENDIX

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
155.975	155.975	155.975	160.575	155.975		139	
156.000	156.000	156.000	160.600	156.000	160.600	00	Min DUPch
156.025	156.025	156.025	160.625	156.025	160.625	60	
156.050	156.050	156.050	160.650	156.050	160.650	01	
156.075	156.075	156.075	160.675	156.075	160.675	61	
156.100	156.100	156.100	160.700	156.100	160.700	02	
156.125	156.125	156.125	160.725	156.125	160.725	62	
156.150	156.150	156.150	160.750	156.150	160.750	03	
156.175	156.175	156.175	160.775	156.175	160.775	63	
156.200	156.200	156.200	160.800	156.200	160.800	04	
156.225	156.225	156.225	160.825	156.225	160.825	64	
156.250	156.250	156.250	160.850	156.250	160.850	05	
156.275	156.275	156.275	160.875	156.275	160.875	65	
156.300	156.300	156.300	160.900	156.300	160.900	06	
156.325	156.325	156.325	160.925	156.325	160.925	66	
156.350	156.350	156.350	160.950	156.350	160.950	07	
156.375	156.375	156.375	160.975	156.375	160.975	67	
156.400	156.400	156.400	161.000	156.400	161.000	08	
156.425	156.425	156.425	161.025	156.425	161.025	68	
156.450	156.450	156.450	161.050	156.450	161.050	09	
156.475	156.475	156.475	161.075	156.475	161.075	69	
156.500	156.500	156.500	161.100	156.500	161.100	10	
156.525	156.525	156.525	161.125	156.525	161.125	70	
156.550	156.550	156.550	161.150	156.550	161.150	11	
156.575	156.575	156.575	161.175	156.575	161.175	71	
156.600	156.600	156.600	161.200	156.600	161.200	12	
156.625	156.625	156.625	161.225	156.625	161.225	72	
156.650	156.650	156.650	161.250	156.650	161.250	13	
156.675	156.675	156.675	161.275	156.675	161.275	73	
156.700	156.700	156.700	161.300	156.700	161.300	14	
156.725	156.725	156.725	161.325	156.725	161.325	74	
156.750	156.750	156.750	161.350	156.750	161.350	15	
156.775	156.775	156.775	161.375	156.775	161.375	75	
156.800	156.800	156.800	161.400	156.800	161.400	16	
156.825	156.825	156.825	161.425	156.825	161.425	76	
156.850	156.850	156.850	161.450	156.850	161.450	17	
156.875	156.875	156.875	161.475	156.875	161.475	77	
156.900	156.900	156.900	161.500	156.900	161.500	18	
156.925	156.925	156.925	161.525	156.925	161.525	78	
156.950	156.950	156.950	161.550	156.950	161.550	19	

- Continued -

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
156.975	156.975	156.975	161.575	156.975	161.575	79	
157.000	157.000	157.000	161.600	157.000	161.600	20	
157.025	157.025	157.025	161.625	157.025	161.625	80	
157.050	157.050	157.050	161.650	157.050	161.650	21	
157.075	157.075	157.075	161.675	157.075	161.675	81	
157.100	157.100	157.100	161.700	157.100	161.700	22	
157.125	157.125	157.125	161.725	157.125	161.725	82	
157.150	157.150	157.150	161.750	157.150	161.750	23	
157.175	157.175	157.175	161.775	157.175	161.775	83	
157.200	157.200	157.200	161.800	157.200	161.800	24	
157.225	157.225	157.225	161.825	157.225	161.825	84	
157.250	157.250	157.250	161.850	157.250	161.850	25	
157.275	157.275	157.275	161.875	157.275	161.875	85	
157.300	157.300	157.300	161.900	157.300	161.900	26	
157.325	157.325	157.325	161.925	157.325	161.925	86	
157.350	157.350	157.350	161.950	157.350	161.950	27	
157.375	157.375	157.375	161.975	157.375	161.975	87	
157.400	157.400	157.400	162.000	157.400	162.000	28	
157.425	157.425	157.425	162.025	157.425	162.025	88	
157.450	157.450	157.450	162.050	157.450	162.050	29	
157.475	157.475	157.475	162.075	157.475	162.075	89	
157.500	157.500	157.500	162.100	157.500	162.100	30	Max DUPch
157.525	157.525	157.525	162.125	157.525		90	
157.550	157.550	157.550	162.150	157.550		31	
157.575	157.575	157.575	162.175	157.575		91	
157.600	157.600	157.600	162.200	157.600		32	
157.625	157.625	157.625	162.225	157.625		92	
157.650	157.650	157.650	162.250	157.650		33	
157.675	157.675	157.675	162.275	157.675		93	
157.700	157.700	157.700	162.300	157.700		34	
157.725	157.725	157.725	162.325	157.725		94	
157.750	157.750	157.750	162.350	157.750		35	
157.775	157.775	157.775	162.375	157.775		95	
157.800	157.800	157.800	162.400	157.800		36	
157.825	157.825	157.825	162.425	157.825		96	
157.850	157.850	157.850	162.450	157.850		37	
157.875	157.875	157.875	162.475	157.875		97	
157.900	157.900	157.900	162.500	157.900		38	
157.925	157.925	157.925	162.525	157.925		98	
157.950	157.950	157.950	162.550	157.950		39	

- Continued -

APPENDIX

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
157.975	157.975	157.975	162.575	157.975		99	
158.000	158.000	158.000	162.600	158.000		40	
158.025		158.025	162.625	158.025		100	
158.050		158.050	162.650	158.050		41	
158.075		158.075	162.675	158.075		101	
158.100		158.100	162.700	158.100		42	
158.125		158.125	162.725	158.125		102	
158.150		158.150	162.750	158.150		43	
158.175		158.175	162.775	158.175		103	
158.200		158.200	162.800	158.200		44	
158.225		158.225	162.825	158.225		104	
158.250		158.250	162.850	158.250		45	
158.275		158.275	162.875	158.275		105	
158.300		158.300	162.900	158.300		46	
158.325		158.325	162.925	158.325		106	
158.350		158.350	162.950	158.350		47	
158.375		158.375	162.975	158.375		107	
158.400		158.400	163.000	158.400		48	
158.425		158.425	163.025	158.425		108	
158.450		158.450	163.050	158.450		49	
158.475		158.475	163.075	158.475		109	
158.500		158.500	163.100	158.500		50	
158.525		158.525	163.125	158.525		110	
158.550		158.550	163.150	158.550		51	
158.575		158.575	163.175	158.575		111	
158.600		158.600	163.200	158.600		52	
158.625		158.625	163.225	158.625		112	
158.650		158.650	163.250	158.650		53	
158.675		158.675	163.275	158.675		113	
158.700		158.700	163.300	158.700		54	
158.725		158.725	163.325	158.725		114	
158.750		158.750	163.350	158.750		55	
158.775		158.775	163.375	158.775		115	
158.800		158.800	163.400	158.800		56	
158.825		158.825	163.425	158.825		116	
158.850		158.850	163.450	158.850		57	
158.875		158.875	163.475	158.875		117	
158.900		158.900	163.500	158.900		58	
158.925		158.925	163.525	158.925		118	
158.950		158.950	163.550	158.950		59	

- Continued -

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
158.975		158.975	163.575	158.975		119	
159.000		159.000	163.600	159.000		200	RX.max.freq
159.025		159.025		159.025		201	
159.050		159.050		159.050		202	
159.075		159.075		159.075		203	
159.100		159.100		159.100		204	
159.125		159.125		159.125		205	
159.150		159.150		159.150		206	
159.175		159.175		159.175		207	
159.200		159.200		159.200		208	
159.225		159.225		159.225		209	
159.250		159.250		159.250		210	
159.275		159.275		159.275		211	
159.300		159.300		159.300		212	
159.325		159.325		159.325		213	
159.350		159.350		159.350		214	
159.375		159.375		159.375		215	
159.400		159.400		159.400		216	
159.425		159.425		159.425		217	
159.450		159.450		159.450		218	
159.475		159.475		159.475		219	
159.500		159.500		159.500		220	
159.525		159.525		159.525		221	
159.550		159.550		159.550		222	
159.575		159.575		159.575		223	
159.600		159.600		159.600		224	
159.625		159.625		159.625		225	
159.650		159.650		159.650		226	
159.675		159.675		159.675		227	
159.700		159.700		159.700		228	
159.725		159.725		159.725		229	
159.750		159.750		159.750		230	
159.775		159.775		159.775		231	
159.800		159.800		159.800		232	
159.825		159.825		159.825		233	
159.850		159.850		159.850		234	
159.875		159.875		159.875		235	
159.900		159.900		159.900		236	
159.925		159.925		159.925		237	
159.950		159.950		159.950		238	

- Continued -

APPENDIX

TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
159.975		159.975		159.975		239	
160.000		160.000		160.000		240	
160.025		160.025		160.025		241	
160.050		160.050		160.050		242	
160.075		160.075		160.075		243	
160.100		160.100		160.100		244	
160.125		160.125		160.125		245	
160.150		160.150		160.150		246	
160.175		160.175		160.175		247	
160.200		160.200		160.200		248	
160.225		160.225		160.225		249	
160.250		160.250		160.250		250	
160.275		160.275		160.275		251	
160.300		160.300		160.300		252	
160.325		160.325		160.325		253	
160.350		160.350		160.350		254	
160.375		160.375		160.375		255	
160.400		160.400		160.400		256	Added ch no.
160.425		160.425		160.425		257	Added ch no.
160.450		160.450		160.450		258	Added ch no.
160.475		160.475		160.475		259	Added ch no.
160.500		160.500		160.500		140	
160.525		160.525		160.525		141	
160.550		160.550		160.550		142	
160.575		160.575		160.575		143	
160.600		160.600		160.600		144	
160.625		160.625		160.625		145	
160.650		160.650		160.650		146	
160.675		160.675		160.675		147	
160.700		160.700		160.700		148	
160.725		160.725		160.725		149	
160.750		160.750		160.750		150	
160.775		160.775		160.775		151	
160.800		160.800		160.800		152	
160.825		160.825		160.825		153	
160.850		160.850		160.850		154	
160.875		160.875		160.875		155	
160.900		160.900		160.900		156	
160.925		160.925		160.925		157	
160.950		160.950		160.950		158	

- Continued -

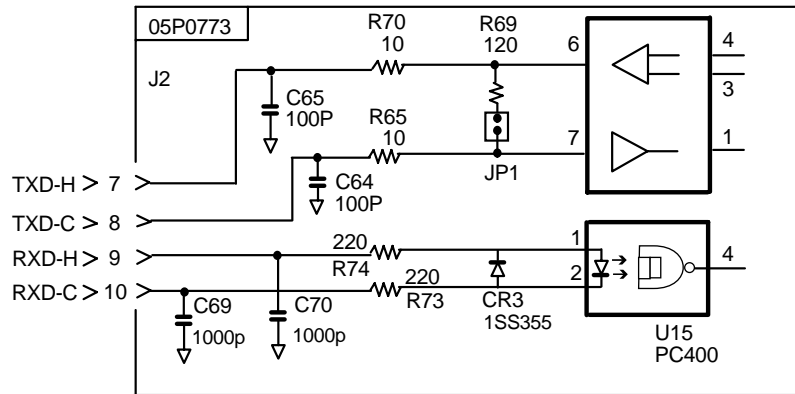
TX		RX				CH NO (current)	Remark
FM-8800S	FM-8800D	FM-8800S		FM-8800D			
Simplex	Sim/Dup	Simplex	Semi-dup	Simplex	Duplex		
160.975		160.975		160.975		159	
161.000		161.000		161.000		160	
161.025		161.025		161.025		161	
161.050		161.050		161.050		162	
161.075		161.075		161.075		163	
161.100		161.100		161.100		164	
161.125		161.125		161.125		165	
161.150		161.150		161.150		166	
161.175		161.175		161.175		167	
161.200		161.200		161.200		168	
161.225		161.225		161.225		169	
161.250		161.250		161.250		170	
161.275		161.275		161.275		171	
161.300		161.300		161.300		172	
161.325		161.325		161.325		173	
161.350		161.350		161.350		174	
161.375		161.375		161.375		175	
161.400		161.400		161.400		176	
161.425		161.425		161.425		177(M2)	
161.450		161.450		161.450		178	
161.475		161.475		161.475		179	

Digital Interface (IEC 61162-1 Edition 2)

Input sentences

GGA, GLL, RMC, ZDA, GNS

Schematic diagram



Load requirements as listner

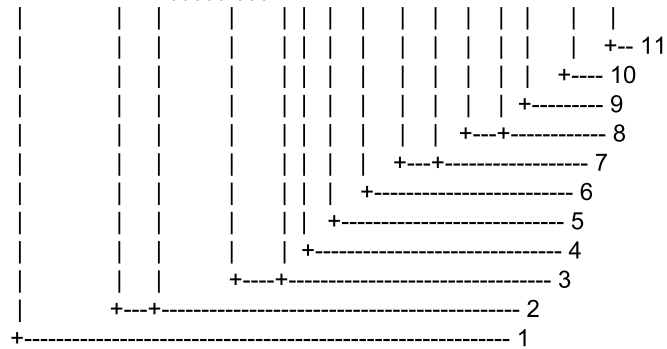
Isolation	Optocoupler
Input impedance	560 ohms
Max. Voltage	±15V
Threshold	4 mA

Output sentence

TLL

GGA - Global positioning system (GPS) fix data

```
$--GGA,hhmmss.ss,lll.lll,aa,yyyyy.yyy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh<CR><LF>
```



1. UTC of position
2. Latitude, N/S
3. Longitude, E/W
4. GPS quality indicator (see note)
5. Number of satellite in use, 00-12, may be different from the number in view
6. Horizontal dilution of precision
7. Antenna altitude above/below mean sealevel, m
8. Geoidal separation, m
9. Age of differential GPS data
10. Differential reference station ID, 0000-1023
11. Checksum

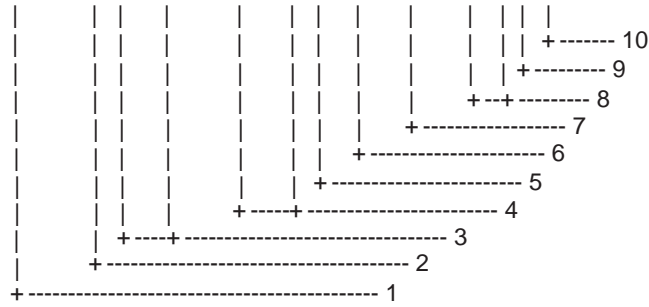
NOTE

- 0 = fix not available or invalid
- 1 = GPS SPS mode, fix valid
- 2 = differential GPS, SPS mode, fix valid
- 3 = GPS PPS mode, fix valid
- 4 = Real Time Kinetic. Satellite system used in RTK mode with fixed integers
- 5 = Float RTK. Satellite system used in RTK mode with floating integers
- 6 = Estimated (dead reckoning) mode
- 7 = Manual input mode
- 8 = Simulator mode

The GPS quality indicator shall not be a null field.

RMC - Recommended minimum specific GPS/TRANSIT data

\$--RMC,hhmmss.ss,A,lll.lll,a,yyyy.yy,a,x .x ,x .x ,x x x x x x ,x .x ,a*hh<CR><LF>



1. UTC of position fix
2. Status: A= data valid, V= navigation receiver warning
3. Latitude, N/S
4. Longitude, E/W
5. Speed over ground, knots
6. Course over ground, degrees true
7. Date: dd/mm/yy
8. Magnetic variation, degree E/W
9. Mode indicator(see note)
10. Checksum

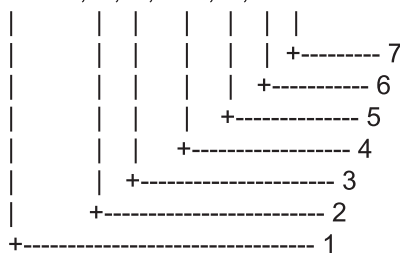
NOTE Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field supplements the Status field. The Status field shall be set to V= invalid for all values of Operating Mode except for A= Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

ZDA - Time and data

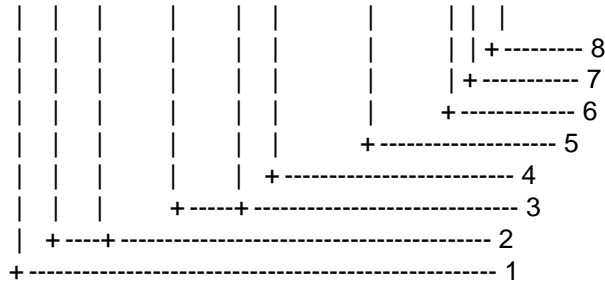
\$--ZDA,hhmmss.ss,xx,xx,xxxx,xx,xx*hh<CR><LF>



1. UTC
2. Day, 01 to 31(UTC)
3. Month, 01 to 12(UTC)
4. Year(UTC)
5. Local zone hours, 00h to +-13h
6. Local zone minutes, 00 to +59
as local hours
7. Checksum

TLL – Target latitude and longitude

\$--TLL,x x ,lll.lll,a,yyyyy.yyy,a,c--c,hhmmss.ss,a,a*hh<CR><LF>



1. Target number 00 - 99
- 2. Latitude, N/S**
- 3. Longitude, E/W**
4. Target name
5. UTC of data
6. Target status(see note)
7. Reference target= R,null otherwise
8. Checksum

NOTE - Target status

- L = lost, tracked target has beenlost
- Q = query, target in the process of acquisition
- T = tracking

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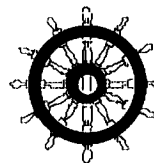
U

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Declaration of conformity**0560**We **FURUNO ELECTRIC CO., LTD.**

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

hereby declare under our sole responsibility that the products

VHF radiotelephone Types FM-8800S (simplex) and FM-8800D (duplex) consisting of Transceiver FM-8800S/FM-8800D, Handset HS-2003, Remote station RB-8810, Remote station with DISTRESS button RB-8800, Junction box IF-8810, DMC interface IF-8820, Handset for remote station HS-8800, AC power supply PR-240/PR-300, Printer PP-510 and Distress message controller DMC-5

(Model names, type numbers)

to which this declaration relates conform to the following standard(s) or normative document(s)

IMO Resolutions A.385(X), A.524(13), A.694(17), MSC.68(68), A.803(19) and IMO MSC Circular MSC/Circ.862

Testing standards EN 301 925: V1.1.1: 2002-09, EN 300 698-1 V1.3.1: 2003-12, EN 300 338 V1.2.1: 1999-04, EN 301 033 V1.1.1: 1998-08, EN 300 828 V1.1.1: 1998-03, EN 60945: 2002 (IEC 60945 4th edition: 2002-08) and EN 61162-1: 2000-07 (IEC 61162-1 2nd edition: 2000-07)

ITU-R Recommendations M.489-2, M.493-10, M.541-8 and M.689-2

(title and/or number and date of issue of the standard(s) or other normative document(s))

For assessment, see

- EC type-examination (MODULE-B) certificate N° 04212003/AA/00 of 18 October 2004 issued by Telefication, The Netherlands
- Production Quality System (MODULE D) Certificate No. P 112 of 20 August 2002 issued by Telefication, The Netherlands
- Test reports 99553530, 99553531, 99553532 and 99553533 of 15 October 2004 issued by Telefication, The Netherlands
- Test reports FLI 12-04-047 of 5 August 2004, FLI 12-04-052 of 16 September 2004 and FLI 12-04-057 of 12 October 2004 prepared by Furuno Labotech International Co., Ltd., Japan

This declaration is issued according to the provisions of European Council Directive 96/98/EC on marine equipment amended by the Commission Directive 2002/75/EC.

On behalf of Furuno Electric Co., Ltd.

Hiroaki Komatsu
Manager,
International Rules and RegulationsNishinomiya City, Japan
October 21, 2004

(Place and date of issue)

(name and signature or equivalent marking of authorized person)