RadioSim – *Free* GMDSS Radio Simulator

Requirements

- Personal computer with a Microsoft Windows operating system (W98SE / W2K / XP).
- TCP/IP protocol suite installed (please see your operating system help file on how to install).
- Ethernet interface card (necessary if you want to connect to other PC).
- Wifi interface supported (for laptop)
- Compatible Sound board.
- Mouse.
- Video resolution 1024x768, better if 1280x1024 pixels (16/32 bit color depht).

Program versions

- **RadioSim.exe** = full version, can be used stand-alone or with other PC running the same application over a LAN to simulate a real-world situation.

- **Tutor.exe** = this software simulate an "A-class" radio or a Coast Radio Station. It's possibile to watch all the traffic, trasmit alerts, distress, urgency, safety messages and routine calls. It's possible to send the Acknowlegment to a received "Distress Alert".

Technical notes

- The simulator use the "UDP Broadcast " protocol to comunicate with the "Tutor" and also with the other copies of simulator if installed on other PC.
- As result, it's possible to connect as many PC as you want, running the same application (please setup each radio with a single MMSI).
- To simulate real world situation, you may connect two PC directly via a ethernet crossed-cable, or connect more PCs via a ethernet HUB or Switch (see drawing) .
- Some firewall or antivirus programs may need to be configured to enable communications between PC over the UDP ports 8090 / 8091 (see your software help for configuration).
- It's strictly necessary that each simulator has a single MMSI, as in the real world.

Authors notes

Disclaimer: Use this program at your own risk ! It's only a tutorial tool and my not agree with the GMDSS – SOLAS requirement and rules ! It's not intended to replace or simulate the real radios equipements ! I am not connected in any way to ICOM company or any subsidyare.

This software is free for any user, you are not allowed to sell, distribute in any form, making money of it !

If you wish to support my work, please just send a greeting e-mail to me telling your suggestions, bugs, request to new features etc !
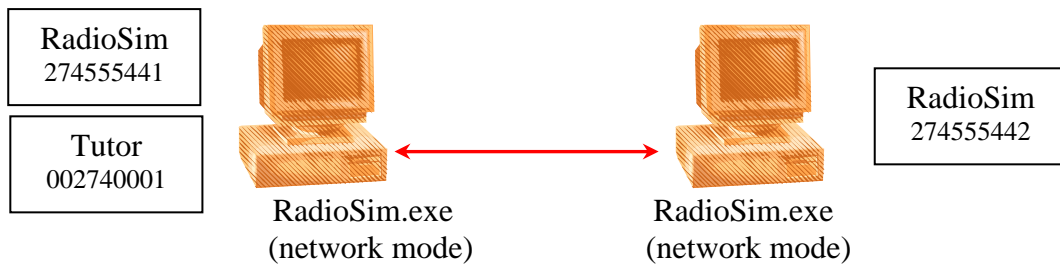
Pietro.bossi@bluewin.ch

- *Examples*

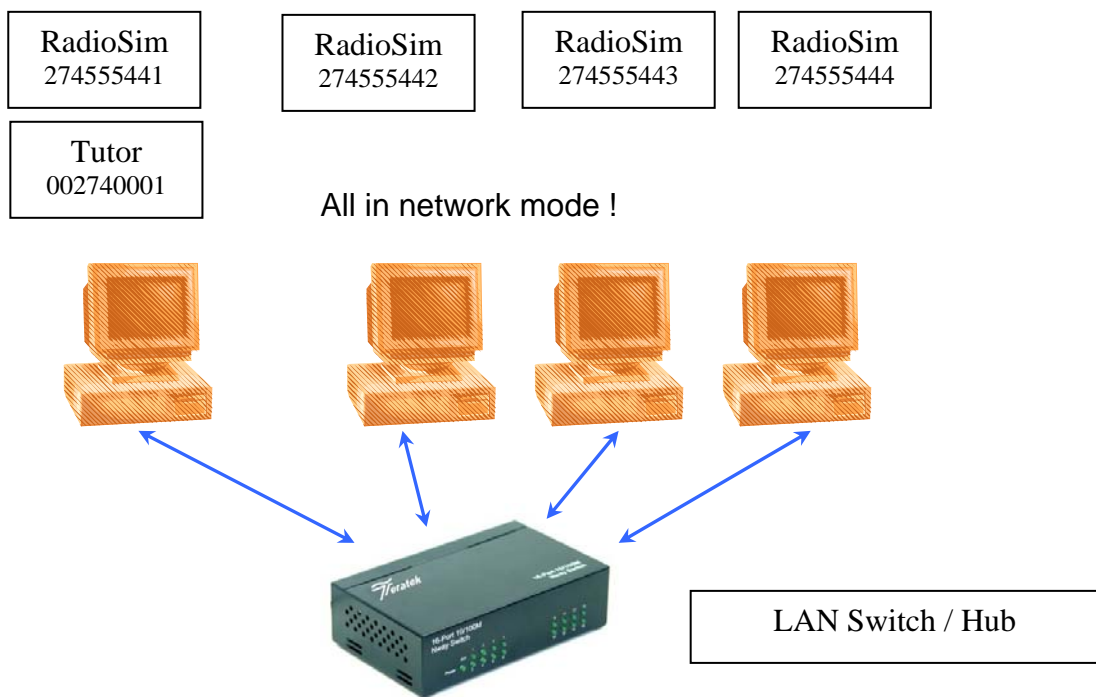1. Single PC

| RadioSim |
| 274555441 |

| Tutor |
| 002740001 |

Radiosim.exe (stand-alone mode)

2. Two PC via a crossed - cable

| RadioSim |
| 274555441 |

| Tutor |
| 002740001 |

| RadioSim |
| 274555442 |

RadioSim.exe
(network mode)

RadioSim.exe
(network mode)

3. More PC on a LAN

| RadioSim |
| 274555441 |

| RadioSim |
| 274555442 |

| RadioSim |
| 274555443 |

| RadioSim |
| 274555444 |

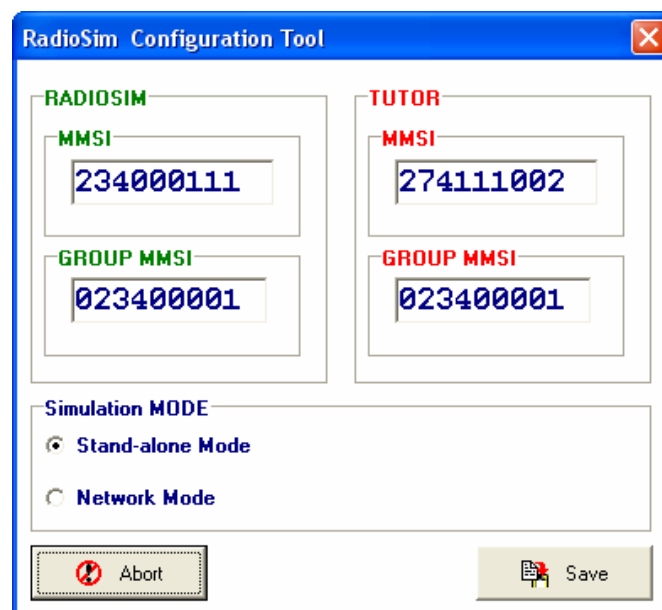| Tutor |
| 002740001 |

All in network mode !

| LAN Switch / Hub |

Program Setup

When you start the Radiosim program for the very first time, you may need to setup your Radio and Tutor MMSI and also the Group-MMSI, in order to enable communications between components or Radiosim installed in other PC.
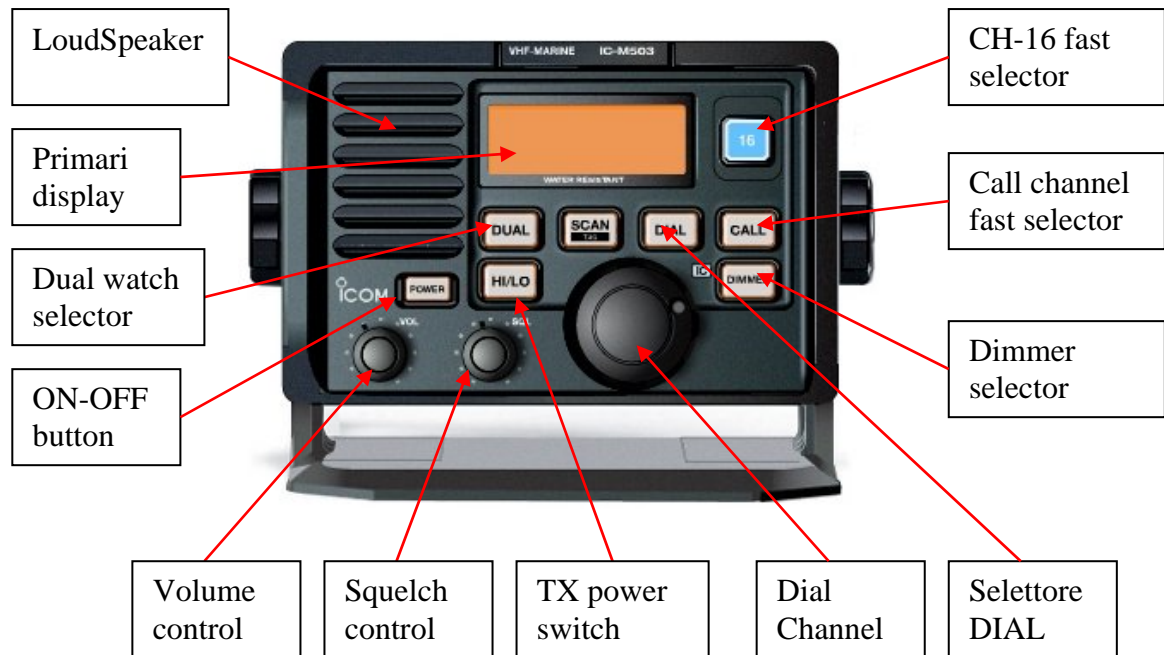
To setup this parameter:

- start the Radiosim simulator and turn ON the radio
- Holding the left ALT key on the keyboard, press the CALL button on the DSC-100 controller.
- You should have this popup menu:

- Enter the Radiosim, Tutor and Group MMSI
- Take care: each radiosim and tutor should have a different MMSI number !
- The Group MMSI could be the same in all simulation, or you may setup different groups to demonstrate different groups calling methods.
- Select the simulation mode:
  - Stand-Alone Mode = Radiosim and Tutor are running in the same computer not connected to other PC
  - Network Mode   = More Radiosims and Tutors are installed on different PC connected in a network (class student) to simulate real world situation.

- Please note that you select Network Mode on a stand-alone PC not fitted with a network interface or not connected to a network via Ethernet interface, you may receive an error message. Please switch to Stand-alone mode.
- When finish, press Save to store your new configuration.

The radio

LoudSpeaker		CH-16 fast selector
Primari display		Call channel fast selector
Dual watch selector		Dimmer selector
ON-OFF button		
Volume control	Squelch control	TX power switch	Dial Channel	Selettore DIAL

Volume Control: set the audio level of the received messages.

Note: when the mouse pointer is over the knob, you may press left or right mouse buttons to adjust the level.

Squelch Control: set the level of the noise suppressor

- Turn [SQL] fully CCW in advance.
- Turn [VOL] to adjust the output audio level.
- Turn [SQL] CW until noise disappear, but don't go much further ! If you go completely CW you won't receive any comunications !

Note: when the mouse pointer is over the knob, you may press left or right mouse buttons to adjust the level.

Channel Selector (DIAL): select the operating radio channel.

- Rotate the dial to select the desired radio channel to be used.

Note: when the mouse pointer is over the knob, you may press left or right mouse buttons to adjust the level.

TX Power Switch [HI/LO]

- Press the [HI/LO] button to toggle the desired trasmission power.
- "25W" or "1W" is displayed on the radio display when you select HIGH (25w) or LOW (1w) trasmit power.
- Select Low-power to comunicate with ship in short distance or to save battery charge power.
- On some channels, the low-power setting will be automatically selected.

Dual-watch Switch [DUAL]

- With this function, you can monitor CH-16 while you are receiving another channel.
- Select the desired operating channel .
- Push [DUAL] to start dualwatch operation.
- "DUAL" appears during dualwatch.
- To cancel dualwatch operation, push [DUAL] again.

Dial Switch [DIAL]

- Push to exit from CH-16 or CALL channel functions.
- You can go back to the channel selected with the DIAL channel selector.

Call channel switch [CALL]

- Push [CALL] to select the preferred call channel.
- In the simulation, you can store the preferred Call channel, select the desired channel with the rotary dial then push and hold the ALT button on the keyboard and push the [CALL] button with the mouse.
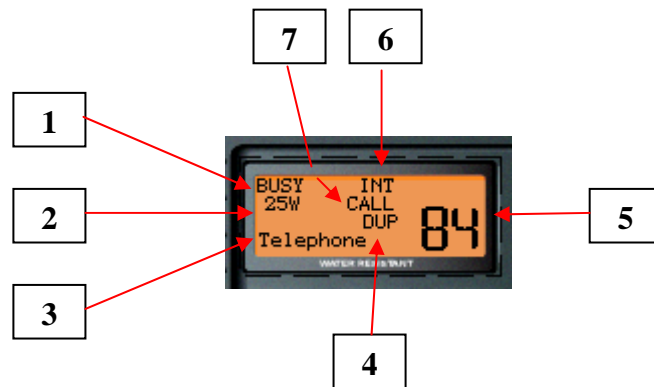

Channel 16 switch [16]

- Push [16] to select channel 16.
- TX power is automatically set to "25W", High power.

Dimmer switch [DIMMER]

- Push to select the backlighting of the LCD display.

Main radio display

1. **BUSY / TRASMIT indicator**

   - "BUSY" appear when receiving a signal or when squelch opens.
   - "TX" appear while trasmitting.

2. **Power indicator**

   - "25W" appear when high power is selected.
   - "1W" appear when low power is selected.

3. **Channel name indicator**

   - Channel comment or name appears if programmend.
   - "DUAL" appear during dual-watch operations

4. **DUPLEX indicator**

   - Appear when a duplex channel is selected.

5. **Channel number readout**

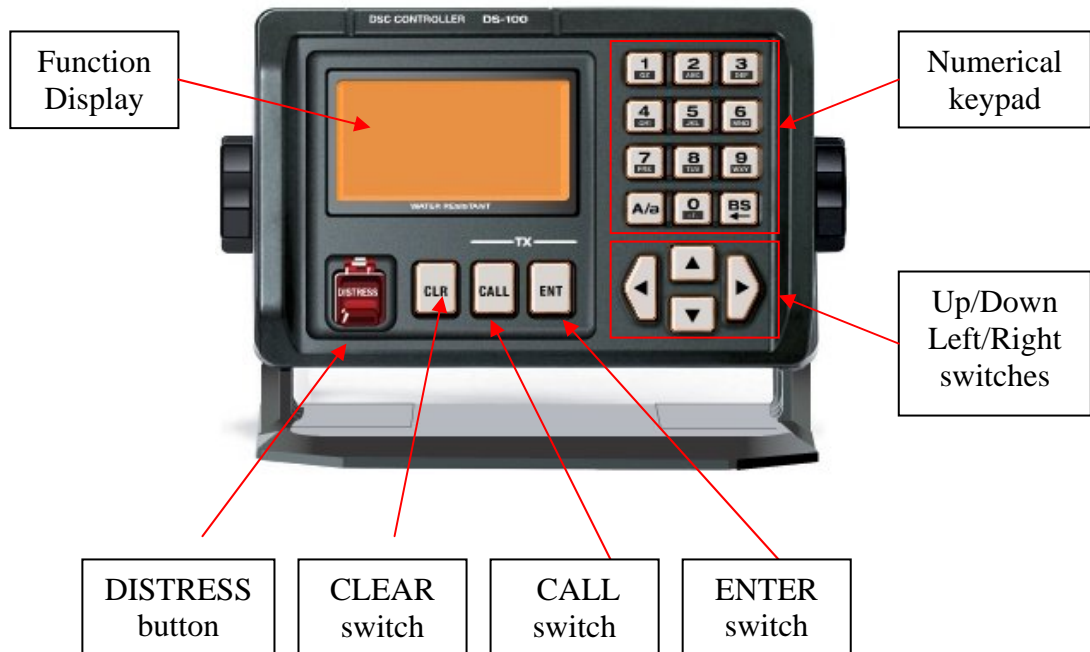   - Indicate the selected operating channel number.

6. **Channel group indicator**

   - Indicate wheter an International, USA, Holland, DSC or ATIS channel is selected.
   - Available channel group depends on version.

7. **CALL channel indicator**

   - Appear when a Call channel is selected.

The DSC controller

Function Display

Numerical keypad

Up/Down Left/Right switches

DISTRESS button

CLEAR switch

CALL switch

ENTER switch

Distress button

- Push and hold for 5 seconds to make a distress call.

Clear Switch [CLR]

- Push this key to cancel CALL repeat (not implemented in the simulation).
- Push this key to cancel the menu.

Call Switch [CALL]

- Press this key to call up a subject menu screen.
- Press this key to return to the start screen.

Enter Switch [ENT]

- Enters the selected subject and advance the item to indicate the contents.
- Push this key to determinate the data.

UP/DOWN/LEFT/RIGHT Switches

- Push [▼]/[▲] to select the menu contents in the selected item.
- Push [◄]/[►] to move the cursor position (not implemented)

Numerical Keypad

- Input the corrispondent number or letter when required.

In the simulation:

- Push [A/a] to clear the inserted data (null data).
- Push [BS] to clear the last inserted data (back-space).

The controller display

1. **GPS indicator**

   - "GPS" appear while a GPS receiver is connected.
   - "MNL' appear when the Time and Position data are input manually.

2. **Position indicator**

   - Show the GPS position data.
   - Show the manually inserted position when no GPS receiver is connected. The indication *"MNL"* appear instead of *"GPS"* on the GPS indicator (see 1).
   - *" No position data"* appear when no GPS receiver is connected and no position data is input manually.

3. **Time and time-zone indicator**

   - Show the time and time-zone data (UTC / Local).
   - *"No time data"* appear when no GPS receiver is connected and no time data is input manually.

Call procedures

Distress Call / Simple procedure

A distress call should be transmitted if, in the opinion of the Master, the ship or a person is in distress and requires immediate assistance. A distress call should include the ship's position and time. They are included automatically when a GPS receiver is connected. If no GPS is connected, input them, if possible.

1. Confirm any distress call is not being received.

2. Lift up the switch cover. Push and hold the [DISTRESS] button for 5 sec. to transmit the distress call.

- A DSC channel (Ch 70) is automatically selected and the distress call is transmitted.
- If you have the time, select the nature of the distress and contents.
- If no GPS is connected, your location and UTC time should be input

3. After transmitting the call, the transceiver is set to the phone frequency (Ch 16) automatically.

- The controller is still waiting on Ch 70 for an acknowledgment

4. When receiving the acknowledgment, reply to the connected station via the transceiver's microphone, with a voice communication on VHF CH-16.

Notes:

Distress alert (simple operation) contains (default);

- Kind of distress: Undesignated distress
- Position data: According to the displayed information.
- GPS or manual input position data held for 23.5 hrs.
- Distress call repeats every 3.5–4.5 min., until receiving an 'acknowledgement'
- Beep (Pi,Pi) sounds with the max. volume every 1 sec.
- Push [DISTRESS] button to transmit a renewed distress call, if desired.
- Push [CLR] to cancel the 'Call repeat' mode.

Distress Call / Regular procedure

Transmit a distress call after selecting the 'Distress setting'.

1. Push [CALL], then push [▾] several times to select 'Distress setting'.

2. Push [ENT] to select <Select a nature>. Push [▾] several times to select the desired nature, then push [ENT].

3. Confirm the location data, then push [ENT] to confirm the time data.

4. Confirm the UTC time, then push [ENT] to confirm the time data.
   - If no GPS is connected, your location and UTC time should be input.

5. Lift up the [DISTRESS] switch cover. Push and hold the button for 5 sec. to transmit the distress call.
   - A DSC channel (Ch 70) is automatically selected and the distress call is transmitted.
   - If no GPS is connected, your location and UTC time should be input.

6. After transmitting the call, the transceiver is set to the voice calling channel (Ch 16) automatically.
   - The controller is still waiting for an acknowledgment call on Ch 70.

7. When receiving the acknowledgment, reply to the connected station via the transceiver's microphone, with a voice communication on VHF CH-16.

The Distress Call procedure

NOTES:

- The "nature of distress' will be valid for 10 min. until a distress call transmits. After 10 min. it reverts to an undesignated distress.
- Distress call repeats every 3.5–4.5 min., until receiving an 'acknowledgement'
- Beep (Pi,Pi) sounds with the max. volume every 1 sec. until acknowledgement is received.
- Push clear to cancel a distress call prior to receiving and an acknowledgement.

Entry position / time

When no GPS receiver is connected, the 'Entry Position/Time' appears at the top of the subject menu.

1. Push [CALL], then push [▾] to select 'Entry Position/Time'.
2. Push [ENT], then enter the latitude data with the key pad.
3. Push [▲] / [▾] to select N; north latitude or S; south latitude, then push [ENT].
4. Enter the longitude data with the key pad.
5. Push [▲] / [▾] to select E;east longitude or W; west longitude, then push [ENT].
6. Insert UTC time with the keypad, then push [ENT].

All Ships Call

1. Push [CALL], then push [▼] one or more times to select 'All ships call', then push [ENT].
2. Select the desired category (Urgency or Safety), then push [ENT].
3. For the "Class D" DSC controller, the following communication channel will always be set automatically to the VHF CH-16 (International Distress, Safety and calling channel).
4. Push [CALL] and [ENT] simultaneously to transmit an All ships call.

   • Push [CLR] to stop the call.

5. Wait for a briefly time (30 sec / 1 min) then trasmit voice message on VHF CH-16.

All Ship Call procedure

Individual Routine Call

1. Push [CALL], then push [▼] several times to select 'Individual call' then push [ENT].

2. Select 'manual entry' to enter 9 digit ID or push [▼] to select the desired ID address, then push [ENT].

3. 'Select a traffic CH' screen appears.

4. Insert your desired traffic channel with the keypad. Then push [ENT].

   - In case of a Individual call to a Coast Station, VHF CH-16 is the default, the communication channel to be used, will be selected by the Coast Station.

5. Push [CALL] and [ENT] simultaneously to transmit an Individual call.

   - Push [CLR] to stop the call.

Individual Routine Call procedure

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Group Call

1. Push [CALL], then push [▾] one or more times to select 'Group call', then push [ENT].

2. Select 'manual entry' to enter 8 digit ID or push [▾] to select the desired ID address. Then push [ENT].

3. 'Select a traffic CH' screen appears.

4. Insert your desired traffic channel with the keypad. Then push [ENT].

5. Push [CALL] and [ENT] simultaneously to transmit an Individual call.

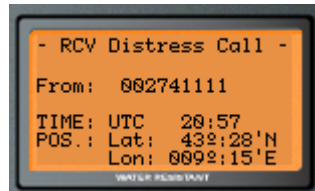   - Push [CLR] to stop the call.

Group Call procedure

Reception procedures

Receiving a distress call

When receiving a distress call, an alarm (Pi-po) sounds with max. AF level continuously. And at the same time, the transceiver's operating channel changes to VHF CH 16 automatically.

- Push [CLR] to cancel the alarm.
- Monitor the communication between the calling ship and a coast station. When no communication is made, contact the ship using voice transmission on VHF CH 16.
- Push [CLR] again to go back to the main screen.

Receiving a Distress ACK

When receiving a distress acknowledgement, an alarm (Pi-po) sounds with max. AF level continuously. And at the same time, the transceiver's operating channel changes to VHF CH 16 automatically.

- Push [CLR] to cancel the alarm.
- You must monitor CH 16 until you can judge from the call that your assistance is unnecessary.
- Push [CLR] again to go back to the main screen.

Receiving an Urgency call

When you receive an Urgency all ships call, an alarm (Pi-po) sounds with max. AF level continuously.

- Push [CLR] to cancel the alarm.
- Push [ENT], then the operating channel changes to the received traffic channel automatically.
- Push [CLR] to record the received information, then the screen goes back to default.

- You must monitor the traffic frequency until you can judge from the call that your action has been effective and/or assistance is unnecessary.

```
-RCV ALL SHIPS CALL-          -RCV ALL SHIPS CALL-

From: 002741111               From: 002741111

CATEGORY: URGENCY             CATEGORY: URGENCY

< CLR=STOP ALARM >            < CLR=Exit / ENT=Ok >
```

Receiving a Safety call

When you receive a Safety all ships call, an alarm (Pi-pi) sounds with max. AF level.

- Push [CLR] to cancel the alarm.
- Push [ENT], then the operating channel changes to the received traffic channel automatically.
- Push [CLR] to record the received information, then the screen goes back to default.

- You must monitor the traffic frequency until you can judge from the call that your action has been effective and/or assistance is unnecessary.

```
-RCV ALL SHIPS CALL-

From: 002741111

CATEGORY: SAFETY

< CLR=Exit / ENT=Ok >
```

Receiving a group call

Quando si riceve una chiamata di gruppo, un breve suono d'allarme (Pi-pi) sarà generato dal controller.

- When receiving a Group call, an alarm (Pi-pi) sounds.
- Push [ENT], then the operating channel changes to the designated channel.
- Push [CLR] to record the received information, then the screen goes back to default.
- The calling station transmits via voice on the designated channel.

```
-RCV ALL SHIPS CALL-
FROM: 002741111
CATEGORY: ROUTINE
< CLR=Exit / ENT=Ok >
WATER RESISTANT
```

Receiving an individual call

- When receiving an individual call, an alarm (Pi-pi) sounds.
- Push [ENT], then the operating channel changes to the designated channel.
- Push [CLR] to record the received information, then the screen goes back to default.
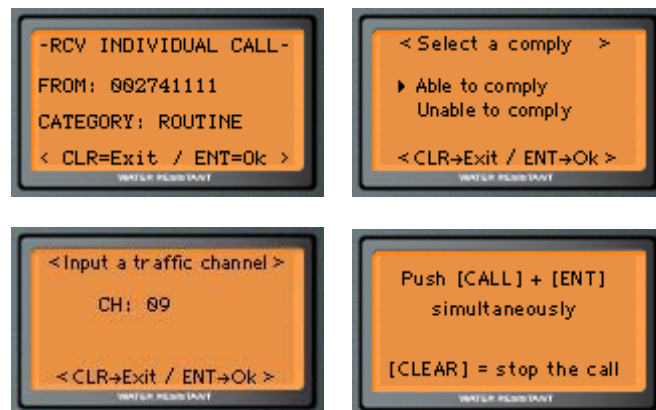- The calling station transmits via voice on the designated channel.

When the individual acknowledgement function is available on your controller, push [ENT] to turn to the <Select to comply> screen.

- Select 'Able to comply' or 'Unable to comply', then push [ENT].
- <Input a traffic channel> menu appear.
- Accept or input a new traffic channel with keypad, then push [ENT].
- Push [CALL] and [ENT] simultaneously to transmit an Individual call ACK..

La sequenza della conferma di una chiamata di routine individuale

```
-RCV INDIVIDUAL CALL-
FROM: 002741111
CATEGORY: ROUTINE
< CLR=Exit / ENT=Ok >
WATER RESISTANT
```

```
< Select a comply   >
▶ Able to comply
  Unable to comply
< CLR→Exit / ENT→Ok >
WATER RESISTANT
```

```
<Input a traffic channel >
    CH: 09
< CLR→Exit / ENT→Ok >
WATER RESISTANT
```

```
Push [CALL] + [ENT]
  simultaneously
[CLEAR] = stop the call
WATER RESISTANT
```

Received message

When receiving a DSC call, the received format is specified and its contents are memorized into the received message (RCV MSG) memory. Distress calls (including other calls with distress category) are stored separately from other calls.

Review Distress messages

- Push [CALL], then push [▼] one or more times to select 'Received calls', then push [ENT].
- Select 'Distress message', then push [ENT].
- Select a desired message, then push [ENT].
- Push [▲] or [▼] to scroll the message.
- Push [A/a], to clear the message.
- Push [CLR] to go back to the "Select a message" screen.
- Messages already visualized are marked with an asterisk "*".

Review other messages

- Push [CALL], then push [▼] several times to select 'Received calls', then push [ENT].
- Select 'Other message', then push [ENT].
- Select the desired message, then push [ENT].
- Push [▲] or [▼] to scroll the message.
- Push [A/a] to clear the message.
- Push [CLR] to go back to the "Select a message" screen.
- Messages already visualized are marked with an asterisk "*".

Individual Call Acknowledgment

1. Push [CALL] , then push [▼] several time to select *"Individual Ack"* , then push [ENT].

2. Push [▲] or [▼] to select the calling station we want to Acknowledge, then push [ENT].

3. <Select a Comply> menu appear

4. Push [▲] or [▼] to select a comply, then push [ENT].

5. <Input a traffic channel> menu appear.

6. Accept or input a new traffic channel with keypad, then push [ENT].

7. Push [CALL] and [ENT] simultaneously to transmit an Individual call ACK.

Setup

Address ID

A total of 15 address ID's can be programmed as "Address ID" (for ships and coast stations) and "Group ID" (for group station).

Adding an address ID

- Push [▼] or [▲] several times to select 'Add an address ID', then push [ENT].
- Push the numeral keys to input an address ID code, then push [ENT].
  - o   When a wrong number is input, push [A/a], then enter the number again.
- Using the PC keyboard, enter the desired name for the ID code (max 12 alphanumeric character can be inserted) then push [ENT].
- Push [▼] or [▲] several times to select the memory number where to store data, then push [ENT].
- Push [ENT] again to confirm.
- Push [CLR] to exit the screen.

Delete an Individual ID

- Push [▼] or [▲] several times to select 'Delete an address ID', then push [ENT].
- Push [▼] or [▲] several times to select the "address ID" to be deleted then press [ENT]
- The selected "address ID"'s name, mmsi and memory are shown on the display.
- Push [ENT] to confirm deletion.
- Push [CLR] to exit to main menu.

Adding a Group ID

- Push [▼] or [▲] several times to select 'Add a group ID', then push [ENT].
- Using numerical keypad insert a new Group ID (9 digit), then push [ENT].
- If you insert a wrong digit, press [A/a], and retry to insert the correct ID.
- Using PC keyboard, insert the destre name (max 12 character) then push [ENT].
- Push [▼]/[▲] several time to select the memory position then push [ENT].
- Push [ENT] to confirm.

Deleting a Group ID

- Push [▼] or [▲] several times to select 'Delete a group ID', then push [ENT].
- Push [▼] or [▲] several times to select the Group ID to be deleted, then push [ENT].
- The "Address ID" data are shown in the displaye.
- Push [ENT] to confirm deletion.
- Push [CLR] to exit.

Offset Time

Local time can be used when the GPS position data is valid and offset time is input.

- Push [CALL], then push [▼] one or more times to select 'Set-up', then push [ENT].
- Select 'Offset time', then push [ENT].
- Push "0; –" or "1; +", then input the time differences.
- Push [ENT] to determine the time or push [CLR] to exit the setup menu.

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Brightness and Contrast

Not implemented in this RadioSim version.

MMSI Check

Your ID code can be displayed via the set-up menu.

Push [CALL], then push [▼] one or more times to select 'Set-up', then push [ENT].
Select 'MMSI check', then push [ENT].
Your ID code shows on the display.
Push [CLR] to exit the Set-up menu.

Extra

When Radiosim is running, hold the left keyboard ALT key and push the Channel Dial Selector. You can see a VHF channel list.
Repeat ALT + Channel Selector to hide the list.