

IC-M421 GMDSS DSC RADIO SIMULATOR



DISCLAIMER

THIS IS NOT A 100% REAL SIMULATION OF THE ICOM IC-M 421 VHF DSC TRANSCEIVER, AND SHOULD BE USED ONLY AS GENERIC EXAMPLE FOR TRAINING PURPOSES ONLY. MAY NOT MEET/RESPECT ALL INTERNATIONAL REQUIREMENTS, RULES AND REGULATIONS AS ITU R-M493.11 AND OTHER SUBSEQUENT DEVELOPMENT OR AMENDMENTS.

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!!USE AT YOUR OWN RISK FOR TRAINING PURPOSES ONLY !!

REQUIREMENTS

- Personal computer with a Microsoft Windows operating system (tested on W7 / W10).
- Ethernet or WIFI interface (necessary if you want to connect to other PC).
- Compatible Soundcard, speaker, microphone or headset.
- Mouse.
- Video resolution 1280x1024, 1920x1080 pixels or more recommended (16/32 bit color depth).

TECHNICAL NOTES

- The simulator use the "UDP Broadcast protocol" to communicate with the "Controller" and 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 different MMSI).
- To simulate real world situation, you may connect two PC directly via an Ethernet crossed-cable, or connect more PCs via an Ethernet HUB or SWITCH (see drawing).
- Simulator use some network's communication ports to talk to other stations. As default, it uses UDP port 8090/8091 for data communication and a set of UDP port starting at 17000 for voice / messages.
- Those communication's ports can be changed, only if necessary, by manually modifying the ICM421.ini configuration file.
- In some case, firewall or antivirus software might be configured to open those range of port to allow communications between different PC running the simulator software.
- In no case, communication from / to the internet will take place due to the technical implementation.

CONNECTION EXAMPLES

1. Single PC installation:

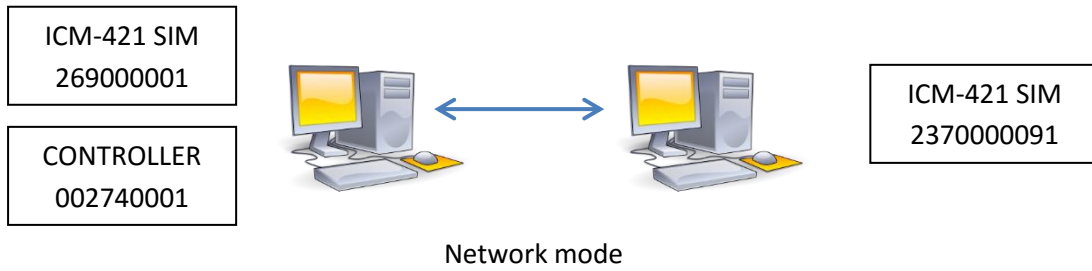
ICM-421 SIM
269000001

CONTROLLER
002740001

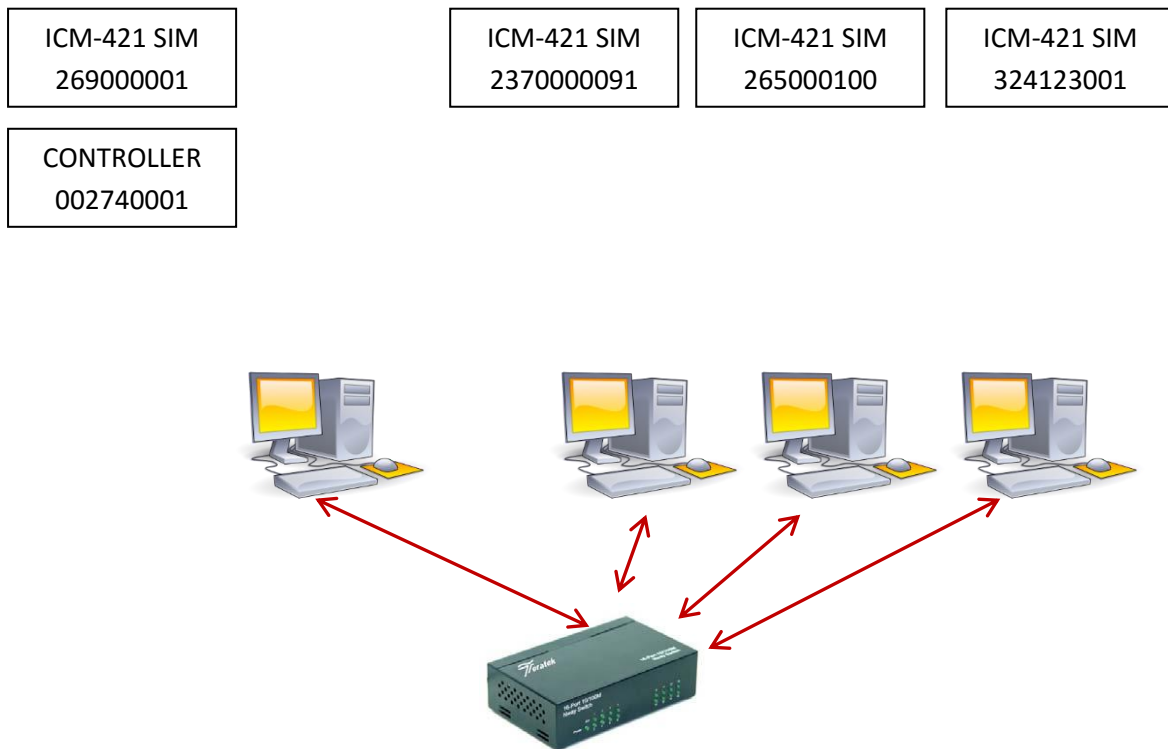


Stand-alone

2. Two PC cross-cable connection:



3. Multiple PC (Ethernet or WIFI connection)



IC-M421 RADIO SETUP

The screenshot shows the 'IC-M 421 Simulator Configuration Tool' window. It is divided into several sections:

- RADIO:**
 - MMSI: 269123000
 - GROUP MMSI: 023400002
 - SHIP NAME: SEAGULL
 - CALL SIGN: HBY-1234
 - SIM MODE: Network mode
 - OPTIONS: Save Screen Pos.
- GPS SETUP:**
 - Latitude: 39 (North selected)
 - Longitude: 8 (East selected)
 - UTC Difference: 1 (between -12 H and 12 H)
- NETWORK:**
 - Bind To: 0.0.0.0
- MEMORY - STATIONS:**

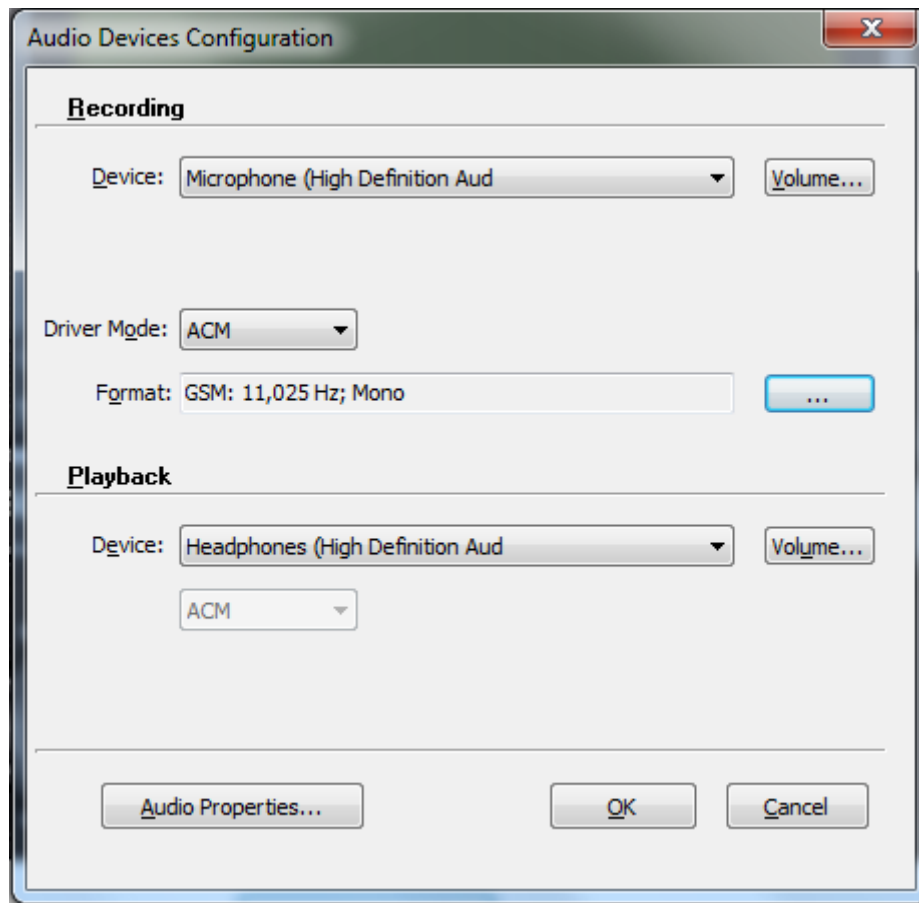
HUNTER	234000201
TUTOR	002340010
COLIBRI	274000003
DOLPHIN	274000004
MEM5	999999999
MEM6	999999999
MEM7	999999999
MEM8	999999999
MEM9	999999999
MEM10	999999999
- MEMORY - GROUPS:**

CRUISING	027400001
RACE1	027400002
CONTROL	027400003
COASTGUARD	027400004
GROUP-5	009999999
GROUP-6	009999999
GROUP-7	009999999
GROUP-8	009999999
GROUP-9	009999999
CROSSMED	002340001

At the bottom, there are 'Abort' and 'Save' buttons.

1. RADIO > MMSI : Your local radio MMSI. Should be unique on each radio.
2. RADIO > GROUP : Your group radio MMSI, to be called with a single MMSI.
3. RADIO > SHIP NAME: the station's name as displayed on the simulator status bar (optional).
4. RADIO > CALL SIGN: the station's call sign as displayed on the simulator status bar (optional).
5. SIM MODE:
 - a. Stand-alone : to be set when simulator and controller are used on same PC
 - b. Network: to be set when multiple PC are used (see connections example).
6. OPTIONS > Screen Position: Remember the simulator's window position each time it is started.
7. NETWORK : In case the PC has more than one Ethernet interface, it define the one to be used. Default setting = 0.0.0.0 mean use any available interface.
8. GPS SETUP > LAT : define the base latitude degrees (00 – 89 N/S) to be used as default.
9. GPS SETUP > LON : define the base longitude degrees (000 – 179 E/W) to be used as default.
10. GPS SETUP > UTC : define the difference between UTC and your local Time (e.g. CET = +1h).
11. STATIONS : names and MMSI of know stations used in the simulation.
12. GROUPS : names and MMSI of know stations used in the simulation.

IC-M 421 AUDIO SETUP



1. Recording:
 - a. Device: Select your audio input device, as microphone or audio interface.
 - b. Driver Mode: select driver for audio communications. Default: ACM
 - c. Format: define quality for audio communication. Default: GSM, 11025Hz, Mono.
 - d. Volume: setting Audio devices volume and properties.
2. Playback:
 - a. Device: Select your output audio device, as speaker, headphone, etc.
 - b. Volume: setting Audio devices volume and properties.
3. Audio Properties: Inspect and modify your PC audio setting and properties.

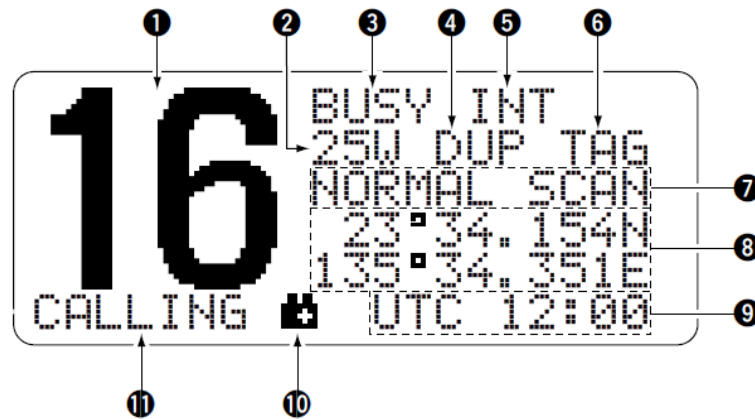
IC-M 421 RADIO CONTROLS



- **POWER / VOL KNOB** : Switch ON/OFF the radio and turn CW or CCW to adjust the audio level.
- **SQL KNOB**: Turn CW or CCW to set the desired squelch threshold level.
- **DISTRESS KEY**: Transmit a DSC Distress Call when pushed for 5 sec.
- **ENTER KEY** : Press briefly to accept function or insert data.
- **CLEAR KEY** : Cancel the entered function and exit the condition when pushed.
- **SCAN KEY** : Press briefly to start / stop the scan function. Only TAG channel will be scanned.
- **CHANNEL UP/DOWN KEYS** : select the operation channels, set mode setting, insert data, etc.
- **CHANNEL 16 / CALL CHANNEL KEY (16.C)**: Press briefly to recall immediately CH-16. Press and hold to recall the preferred CALL CHANNEL. Move cursor backwards one step during position / time and MMSI input.
- **CHANNEL / DUAL KEY** : Press briefly to return to the last channel selected with the up - down keys. Press and hold to start the dual watch function. Move cursor forwards one step during position / time input.
- **MENU KEY**: Toggle the DSC MENU ON/OFF when pushed. Not all functions are yet available on this simulator.

Note: to switch OFF the IC-M421 radio, it's necessary to press the left ALT key on your PC's keyboard and then click with the mouse over the Power/Volume radio knob.

IC-M 421 RADIO DISPLAY



1. **CHANNEL READOUT:** Indicates the current selected operating channel.
2. **POWER INDICATOR:** 25W appear when high power is selected or 1W when low power selected.
3. **BUSY / TX:** Appears if the radio is receiving a signal or when squelch open (BUSY) or when in transmission mode (TX).
4. **DUPLEX INDICATOR:** appears when a duplex channel is selected.
5. **CHANNEL GROUP:** indicates which channel group is selected (INT, USA, ATIS, DSC).
6. **TAG INDICATOR:** appears when a tagged channel is selected.
7. **SCAN INDICATOR:** show the status and mode of scan function.
8. **POSITION:** indicate the current position (LAT / LON) if GPS is connected or if manual inserted.
9. **TIME:** Show the current time data if a GPS is connected or if manually inserted.
10. **LOW BATTERY INDICATOR** (not implemented on the simulation).
11. **CHANNEL COMMENT:** show the name assigned to the selected channel.

NB: for further detailed information, please see the original Icom IC-M 421 user manual.

DSC CALLING PROCEDURES

DSC DISTRESS ALERT / 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 of validity. They are included automatically when a GPS receiver is connected. If no GPS is connected and situation permit, input manually your position and time of validity.

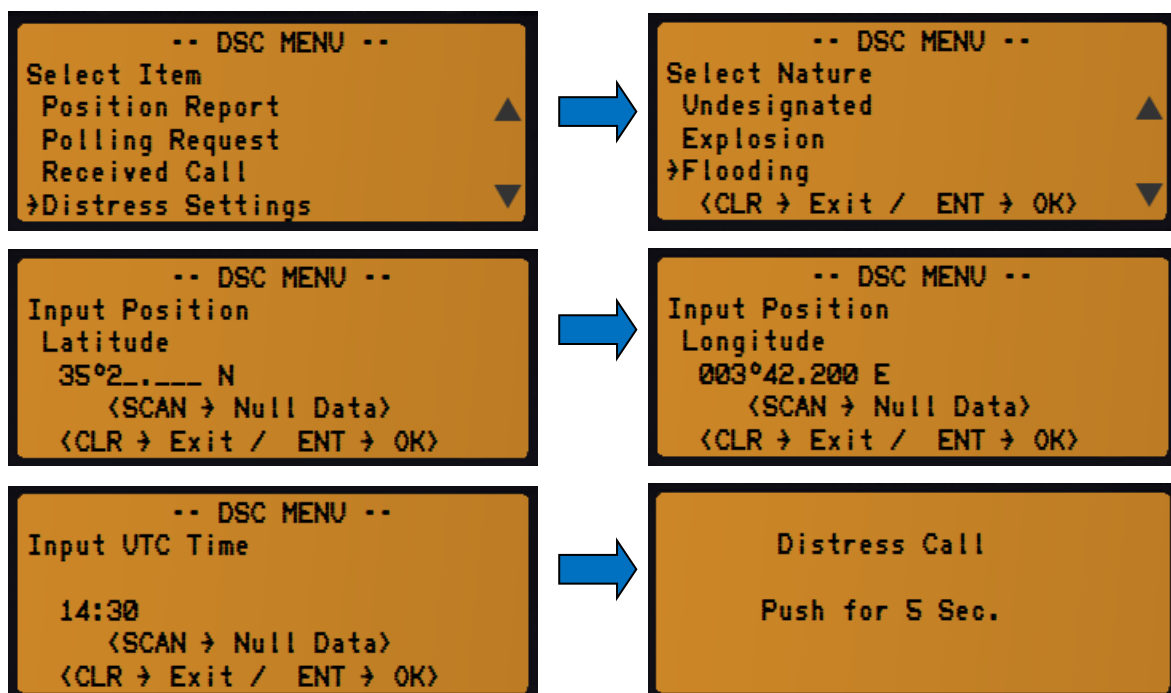
1. Lift the red DISTRESS switch cover, then press and hold the [DISTRESS]key for 5 second.
The DISTRESS menu will appear on the LCD. The backlight of the LCD flashes while the radio display is counting down.
2. The IC-M 421 watches for an DSC acknowledgment call on CH-70 or a voice call on CH-16 from a coast station or another vessel.
3. When a distress DSC ACK is received on CH-70, a DSC DISTRESS alarm sounds and CH-16 will be automatically selected. The LCD shows the MMSI of the station responding to your distress.
4. If no DSC ACK is received, the Distress alert will be repeated at approximately 3 - 4 minute intervals until a DSC ACK is received.
5. To cancel the DSC Distress alarm signal from the speaker, press the CLR key.
6. Best practice: after DSC Distress call is transmitted on CH-70, wait 30 second then select CH-16 and transmit a voice DISTRESS CALL and DISTRESS MESSAGE.
7. If a DSC ACK is received on CH-70 or a station respond to your distress call on CH-16, pick up the microphone, press the PTT button and advise your distress situation.

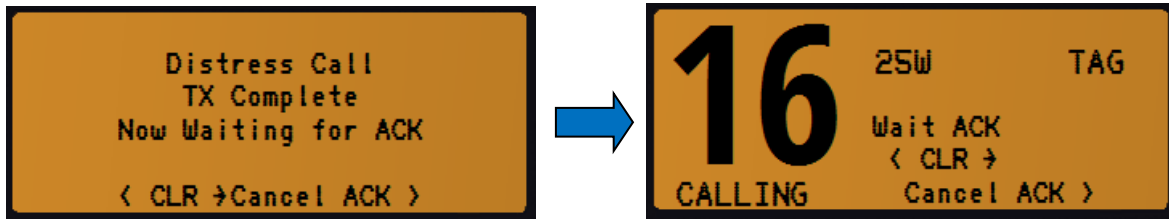
DSC DISTRESS ALERT WITH NATURE OF DISTRESS

The IC-M 421 simulator is capable of transmitting a DSC Distress Alert with the following “Nature of Distress” categories (as required by ITU Rec. M-493-13 p. 8.1.1):

UNDESIGNATED, EXPLOSION, FLOODING, COLLISION, GROUNDING, CAPSIZING, SINKING, ADRIFT, ABANDONING, PIRACY, MOB

1. Push the **[MENU]** key to enter the DSC MENU.
2. Push **[UP / DOWN]** keys to select <DISTRESS SETTING> and then push **[ENT]**.
3. The <DISTRESS> menu will appear on the LCD.
4. Push **[UP / DOWN]** keys to select the nature of distress, then push **[ENT]**.
5. Regardless of a GPS receiver connection, the current position / time information appear.
6. If it's not necessary to input or modify the information, push **[ENT]** to skip the data input steps.
7. The position information appears. Set your position (LAT and LONG) using **[UP / DOWN]** keys.
8. Push **[CH]** or **[16]** to move the cursor forward or backward respectively.
9. Push **[SCAN]** one sec. to clear the position and UTC time data.
10. Push **[CLR]** to cancel and return to the DSC Menu.
11. Press and hold the **[DISTRESS]** key for 5 second until the Distress Alert is transmitted.
12. After 2 sec. the transceiver will be set to CH-16 automatically.
13. Perform steps 2 to 7 of the basic operation described on previous section.



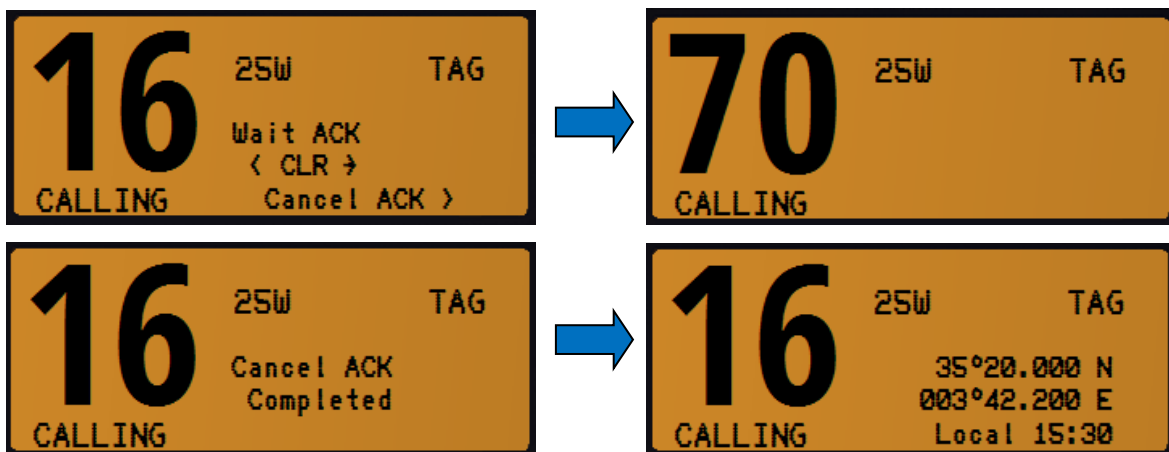


CANCELLING A DSC DISTRESS ALERT

After a DSC DISTRESS CALL is transmitted, it is repeated every 3 - 4 minutes until the call is cancelled by the user or until the radio is turned OFF and ON again.

The IC-M 421 has the capability to transmit a DSC DISTRESS CANCEL call by pressing the [CLR] key.

- A DSC Distress Cancel will be transmitted on CH-70 then the transceiver will be set to CH-16 automatically and normal operation will be resumed.



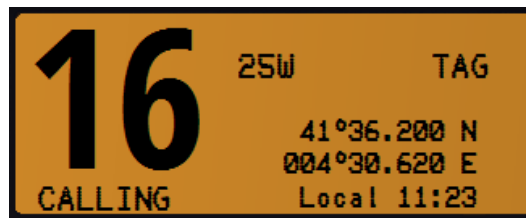
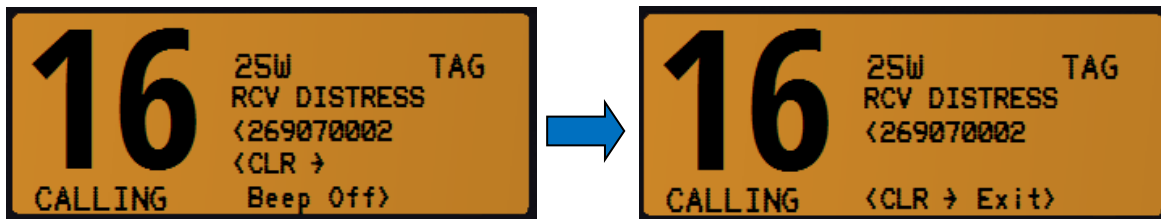
✓ **Best Practice**

In case of a false DSC distress alert transmission, please proceed as follow:

- Switch OFF your radio using the Power / Volume knob.
- This will interrupt the automatic alert transmission every 3 -4 minutes.
- Switch ON the radio and select channel 16.
- Transmit a voice DISTRESS CANCEL announce to inform the other stations about the situation.

RECEIVING A DSC DISTRESS ALERT

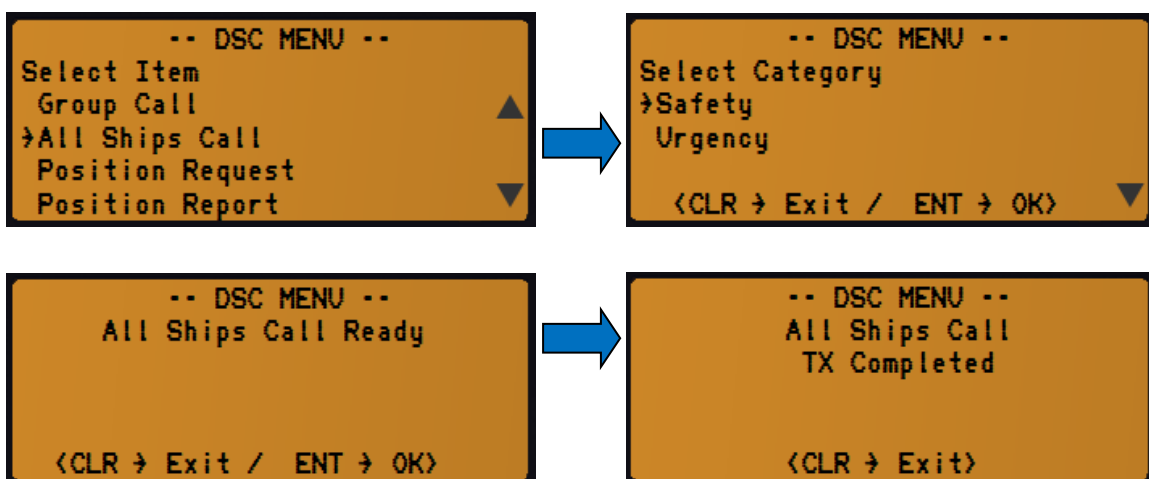
1. When a DSC Distress Alert is received, an emergency alarm sounds and the transceiver will be set to CH-16 automatically.
2. The display will show the MMSI or name of the vessel transmitting the distress.
3. Push the **[CLR]** key to stop the alarm sound.
4. Push the **[CLR]** key again to return to normal radio operation.



ALL SHIPS CALL

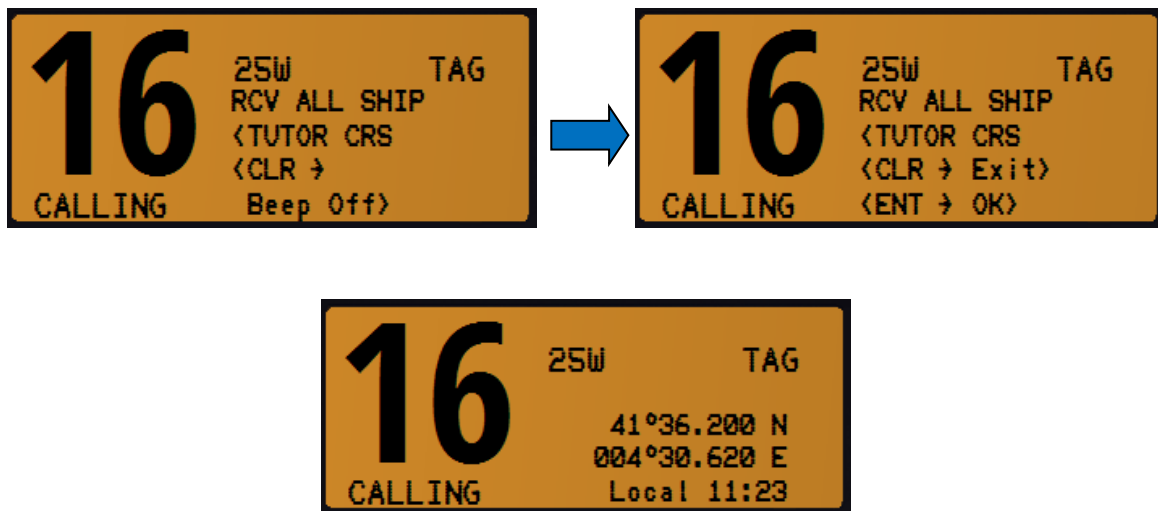
The ALL SHIPS CALL functions allow contact to be established with other vessels and coast stations without knowing their own MMSI ID. Also, priority for the call, can be designated as “URGENCY” or “SAFETY”.

- URGENCY CALL
 - This type of call is used when a vessel may not truly be in distress, but has a potential problem that may lead to a distress situation. This DSC call is usually followed by an Urgency call on CH-16 using radio-telephony (PAN PAN).
 - SAFETY CALL
 - This type of call is used to transmit important navigational or meteorological information to other vessels. This DSC call is usually followed by a Safety call on CH-16 using radio-telephony (SECURITE).
1. Press the **[MENU]** key. The <DSC MENU> will appear.
 2. Push **[UP / DOWN]** keys to select <ALL SHIPS CALL> then push **[ENT]**.
 3. Push **[UP / DOWN]** keys to select the desired category then push **[ENT]**.
 4. The <All Ships Call Ready> display appear.
 5. Push **[ENT]** to transmit the DSC call on CH-70.
 6. After the All Ships Call has been transmitted, the screen will indicate the TX is completed.
 7. Push **[CLR]** or wait 2 second to return to normal radio operation.
 8. The transceiver will be set to CH-16 automatically.



RECEIVING AN ALL SHIP CALL

1. When a DSC All Ship Call is received, an emergency alarm sounds.
2. The display will show the MMSI or name of the vessel or coast station transmitting the All Ship Call.
3. Push the **[CLR]** key to stop the alarm sound.
4. Push the **[ENT]** to monitor the channel for an announcement from the calling station.
5. Push the **[CLR]** key to ignore the call.



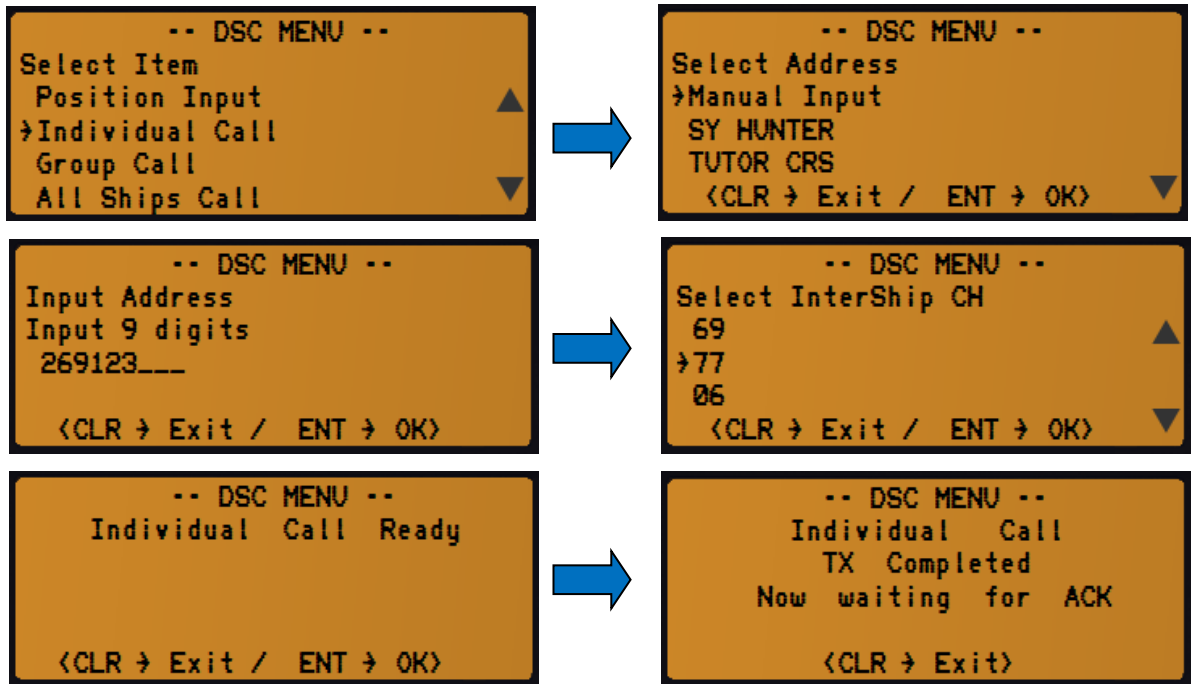
INDIVIDUAL CALL

This feature allows the user to contact another vessel or coast station with a DSC VHF radio and automatically switch the receiving radio to a desired communication channel and ring like a telephone.

INDIVIDUAL CALL – Manual MMSI entry

1. Push the **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <INDIVIDUAL CALL> then push **[ENT]**.
3. The transceiver will show the <INDIVIDUAL CALL> menu.
4. Push **[UP / DOWN]** keys to select <MANUAL INPUT> then push **[ENT]**.
5. Set the 9 digit MMSI number for the individual you wish to call using **[UP / DOWN]** keys.
6. When a digit is set, push **[CH.DUAL]** key to move to the next digit to be entered.
7. Repeat the procedure until all nine space of the MMSI number which you want to contact are entered.
8. If a mistake was made entering the MMSI number, repeat pressing the **[CH.DIAL]** or **[16.C]** until the wrong digit is selected and then push **[UP / DOWN]** keys to correct the entry.
9. When all 9 MMSI digits are entered push the **[ENT]**.
10. Push **[UP / DOWN]** keys to select a proposed Intership communication channel, then push **[ENT]**.
11. The <Individual Call Ready> menu appear.
12. Push **[ENT]** to transmit the individual call.
13. After the Individual Call is transmitted, if a reply signal is not received, <WAITING FOR ACK> is shown on the display which means that the IC-M421 is waiting for the station you called to send an acknowledgment.
14. Push the **[CLR]** key to ignore the waiting for acknowledgement and return to normal operation.

15. When the IC-M421 receives an <ABLE TO COMPLY> acknowledgment from the station you called, the radio will automatically switch to the operating channel selected in step 10 and produce a ringing sound.
16. Push the **[CLR]** key to stop the ringing alarm.
17. Press the microphone PTT button and call the other station you desire to communicate with.
18. Push the **[CLR]** key to revert to normal operation mode.



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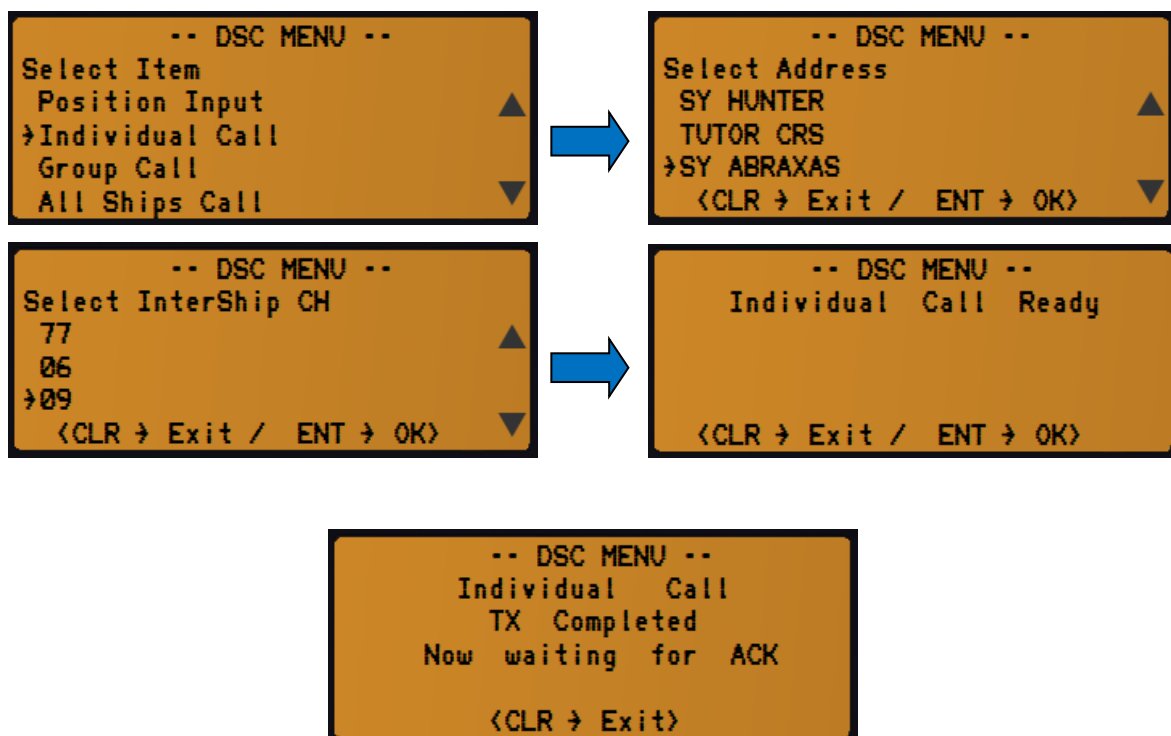
77 25W TAG
RCV INDV ACK
<269123010
<CLR →
SHIP-SHIP Beep Off)

```

INDIVIDUAL CALL – Using Individual Call Directory

This feature allows the user to contact another vessel or coast station with a DSC VHF radio and automatically switch the receiving radio to a desired communication channel and ring like a telephone. The desired party station MMSI ID can be selected from a stored Call Directory instead of manually insert the desired MMSI ID.

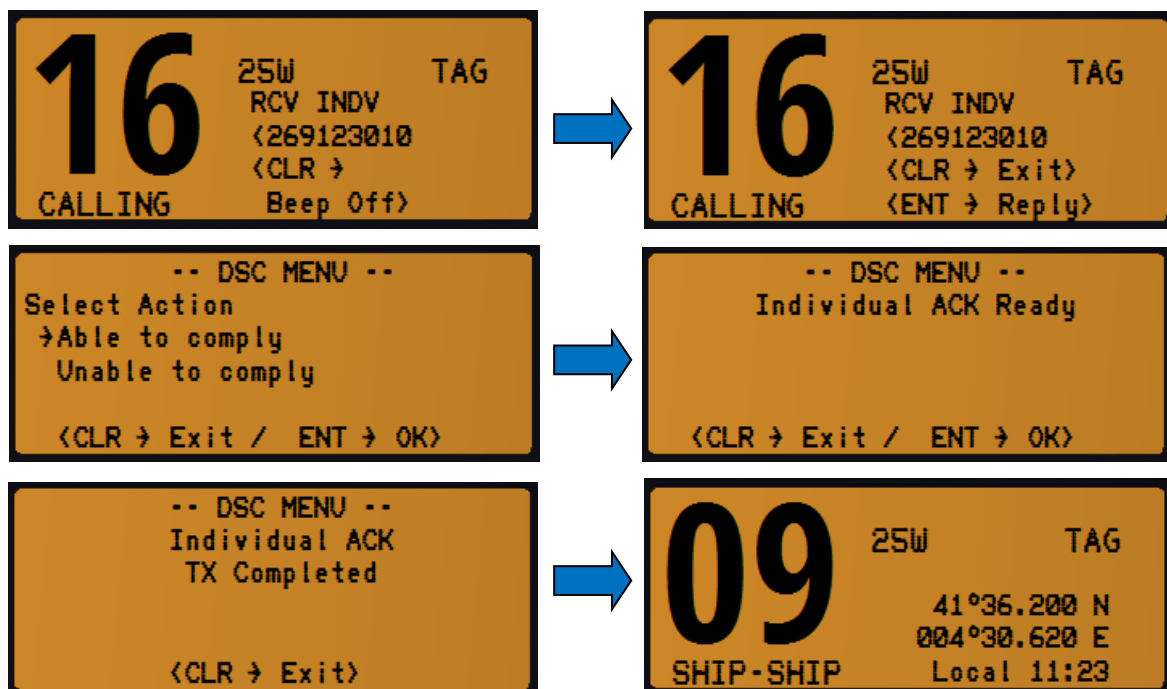
1. Press the **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <INDIVIDUAL CALL> then push **[ENT]**.
3. The transceiver will show the <INDIVIDUAL CALL> menu.
4. Push **[UP / DOWN]** keys to select the pre-programmed individual address then push **[ENT]**.
5. Push **[UP / DOWN]** keys to select a proposed Intership communication channel, then push **[ENT]**.
6. The <Individual Call Ready> menu appear.
7. Push the **[ENT]** to transmit the individual call.



RECEIVING AN INDIVIDUAL CALL

When receiving an Individual Call, you can transmit an acknowledgement (<Able to Comply> or <Unable to Comply>) to the calling station using the on-screen prompts.

1. When a DSC Individual call is received, a ringing alarm sounds.
2. The display will show the MMSI or name of the vessel transmitting the Individual Call.
3. Push **[CLR]** button once to stop the ringing alarm.
4. Push **[CLR]** button again to ignore the individual call and to revert to normal operation.
5. Push **[ENT]** to accept the individual call.
6. Select <ABLE TO COMPLY> or <UNABLE TO COMPLY> using **[UP / DOWN]** keys then press **[ENT]** to confirm the selection.
7. The <Individual Ack Ready> menu appear.
8. Push **[ENT]** to transmit the individual call acknowledgement.
9. When you transmit an <ABLE TO COMPLY> acknowledgment to the party station, the radio will automatically switch to the received operating channel.



GROUP CALL

This feature allows the user to contact a group of specific vessels (example: members of yacht club) or coast stations with a group MMSI number using the group call function and to automatically switch to a desired channel for voice communications.

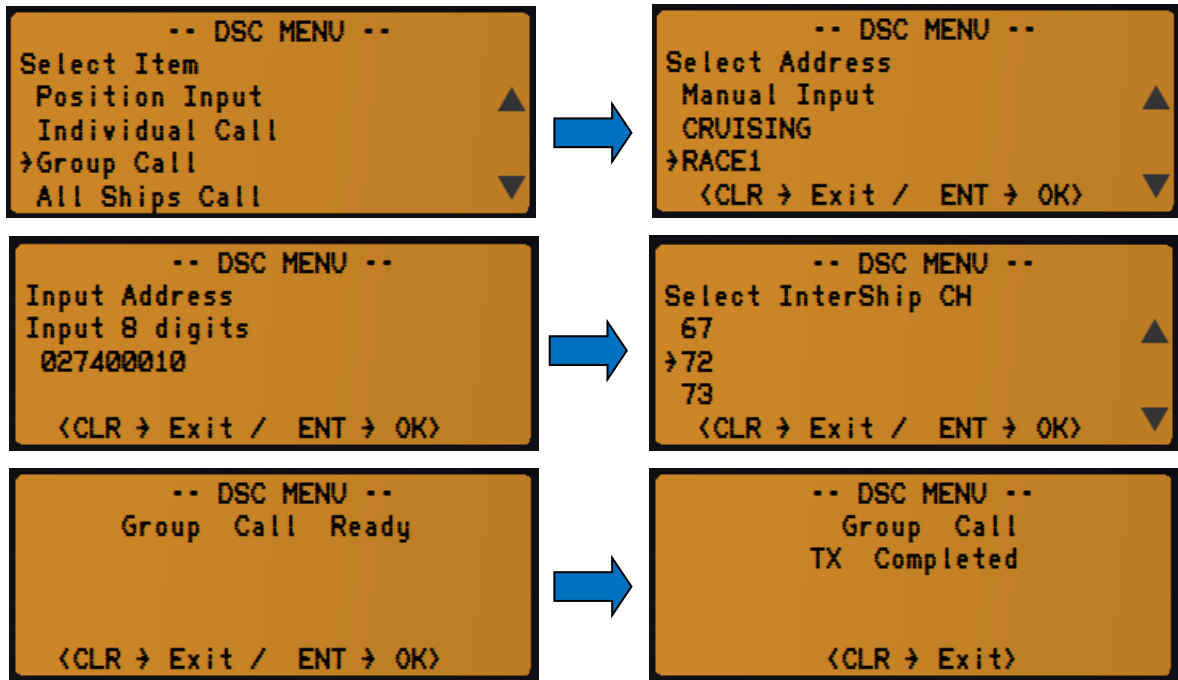
This function is very useful for yachts club and vessels traveling together that want to make collectively announcements on a predetermined channel.

Note: usually a GROUP MMSI is not provided by the national or government authority and must be inserted by each group member following a best practice recommended by international rules:

- First digit must be always a zero.
- Next 3 digits must follow the nation's assigned Maritime Identification Digit (MID).
- Following 5 digit may be set as desired but different from any other group in the region.

GROUP CALL – Manual GROUP MMSI entry

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <GROUP CALL> then push **[ENT]**.
3. The transceiver will show the <GROUP CALL> menu.
4. Push **[UP / DOWN]** keys to select <MANUAL INPUT> then push **[ENT]**.
5. The first digit is always a fixed "0" indicating that it will be a group MMSI number.
6. Set the other 8 digit MMSI number for the group you wish to call using **[UP / DOWN]** keys.
7. When a digit is set, push **[CH.DUAL]** to move to the next digit to be entered.
8. Repeat the procedure until all eight space of the MMSI number which you want to contact are entered.
9. If a mistake was made entering the MMSI number, repeat pressing the **[CH.DUAL]** or **[16.C]** until the wrong number is selected and then push **[UP / DOWN]** keys to correct the entry.
10. When all 8 digits are entered push the **[ENT]**.
11. Push **[UP / DOWN]** keys to select a proposed Intership communication channel, then push **[ENT]**.
12. The <Group Call Ready> menu appear.
13. Push **[ENT]** to transmit the group call.
14. After the Group Call is transmitted, the radio will automatically switch to the operating channel selected in step 11.
15. Listen to the channel to make sure it is not busy, then press the microphone PTT button and transmit the message to the group of stations you desire to communicate with.
16. Push the **[CLR]** key to revert to normal operation mode.



72 25W TAG
41°36.200 N
004°30.620 E
PORT-OPS Local 11:23

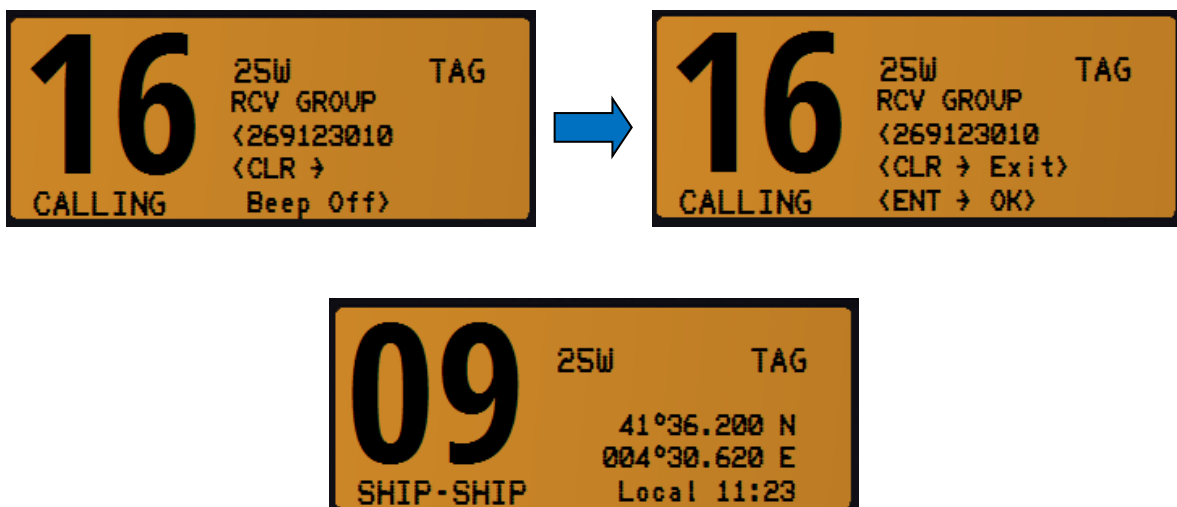
GROUP CALL – Using Group Call Directory

This feature allows the user to contact a group of vessels or coast stations. The desired GROUP MMSI ID can be selected from a stored Call Directory instead of manually insert the desired GROUP MMSI ID.

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <GROUP CALL> then push **[ENT]**.
3. The transceiver will show the <GROUP CALL> menu.
4. Push **[UP / DOWN]** keys to select the pre-programmed group address then push **[ENT]**.
5. Perform steps 11 to 16 described on previous section to call the desired group.

RECEIVING A GROUP CALL

1. When a DSC Group call is received, a ringing alarm sounds.
2. The display will show the MMSI or name of the vessel transmitting the Group Call.
3. Push **[CLR]** to stop the ringing sound.
4. Push **[CLR]** again to ignore the group call and to revert to normal operation.
5. Push **[ENT]** to accept the group call.
6. Monitor the channel for the station calling the group for a message.
7. If you want to respond, monitor the channel to make sure it is clear, then press the microphone PTT button and talk to the calling station.



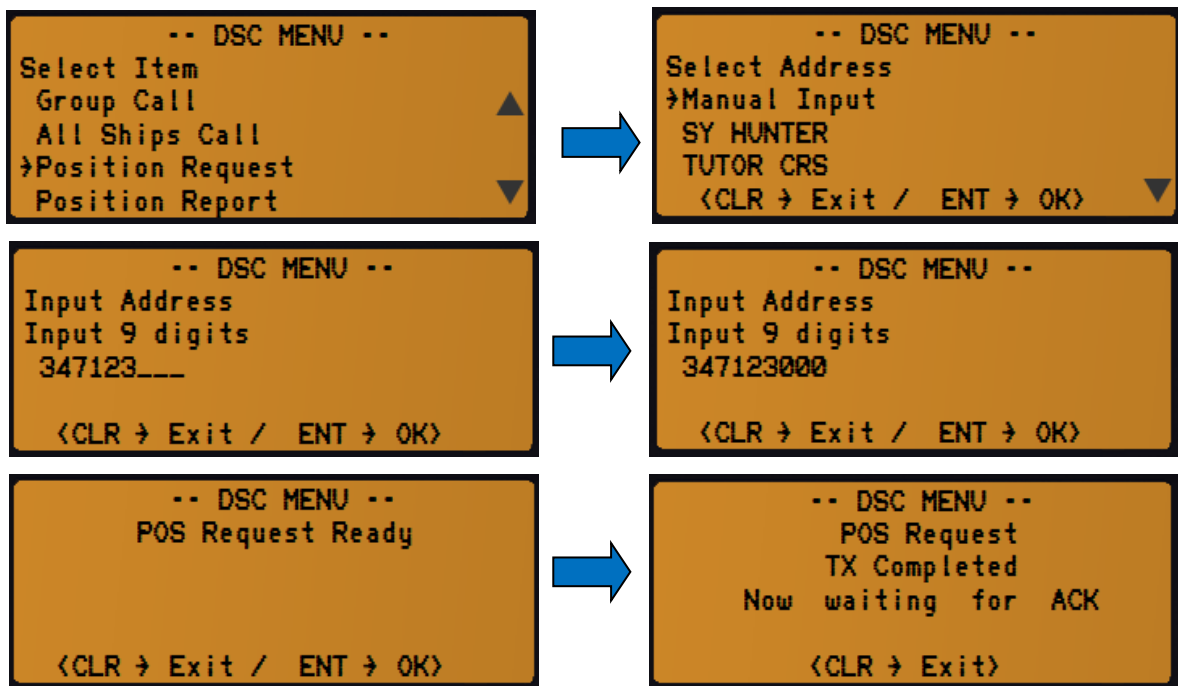
POSITION REQUEST CALL

This feature allows the user to poll the location of another vessel and show the position of that vessel on the LCD display. This is a great feature for anyone wanting to know the precise position of another vessel, for example a friend's boat you are cruising with.

Note: the other vessel must be equipped with an operating GPS receiver connected to an adequate DSC transceiver and must not have set the transceiver to deny position request!

POSITION REQUEST – Manual MMSI entry

1. Push [**MENU**] key. The <DSC MENU> will appear.
2. Push [**UP / DOWN**] keys to select <POSITION REQUEST> then push [**ENT**].
3. Push [**UP / DOWN**] keys to select <MANUAL INPUT> then push [**ENT**].
4. Set the 9 digit MMSI number for the vessel you wish to call using [**UP / DOWN**] keys.
5. When a digit is set, push [**CH.DUAL**] to move to the next digit to be entered.
6. Repeat the procedure until all 9 space of the MMSI number which you want to contact are entered.
7. If a mistake was made entering the MMSI number, repeat pressing the [**CH.DUAL**] or [**16.C**] until the wrong digit is selected and then push [**UP / DOWN**] keys to correct the entry.
8. When all 9 digits are entered push the [**ENT**].
9. The <Pos Request Ready> menu appear.
10. Push the [**ENT**]to transmit the position request.
11. After the position request call has been transmitted, the radio wait for the acknowledgement from the other station.
12. Push the [**CLR**] key to revert to normal operation mode.

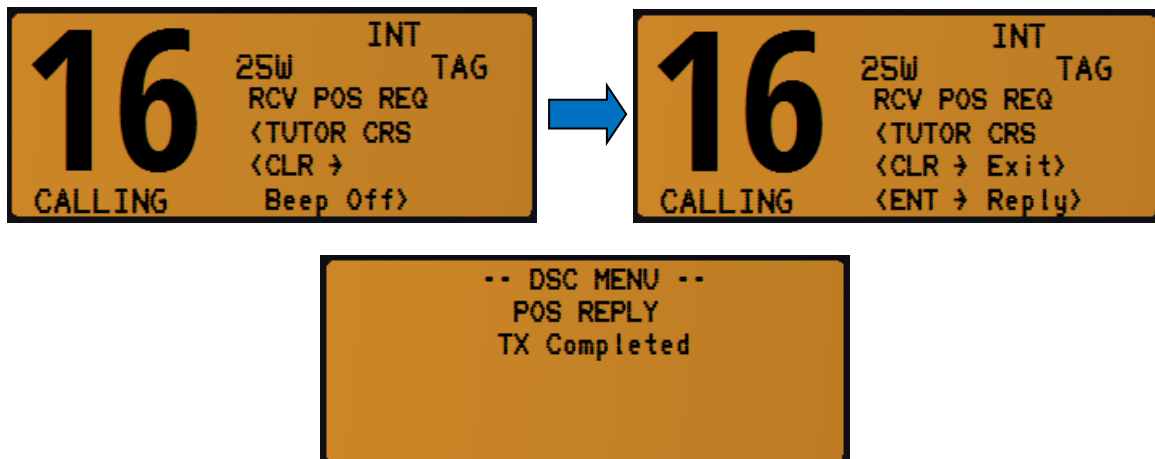


POSITION REQUEST – Using Individual Call Directory

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <POSITION REQUEST> then push **[ENT]**.
3. Push **[UP / DOWN]** keys to select the pre-programmed station address then push **[ENT]**.
4. Perform steps 9 to 12 described on previous section to call the desired station.

RECEIVING A POSITION REQUEST CALL

1. When a DSC Position Request call is received, <RCV POS REQ> appears and a beep alarm sounds .
2. The display will show the MMSI or name of the requesting vessel.
3. Push **[CLR]** to stop the beep.
4. Push **[ENT]** to reply to the position request call.
5. Push **[CLR]** to ignore the position request call and to revert to normal operation.

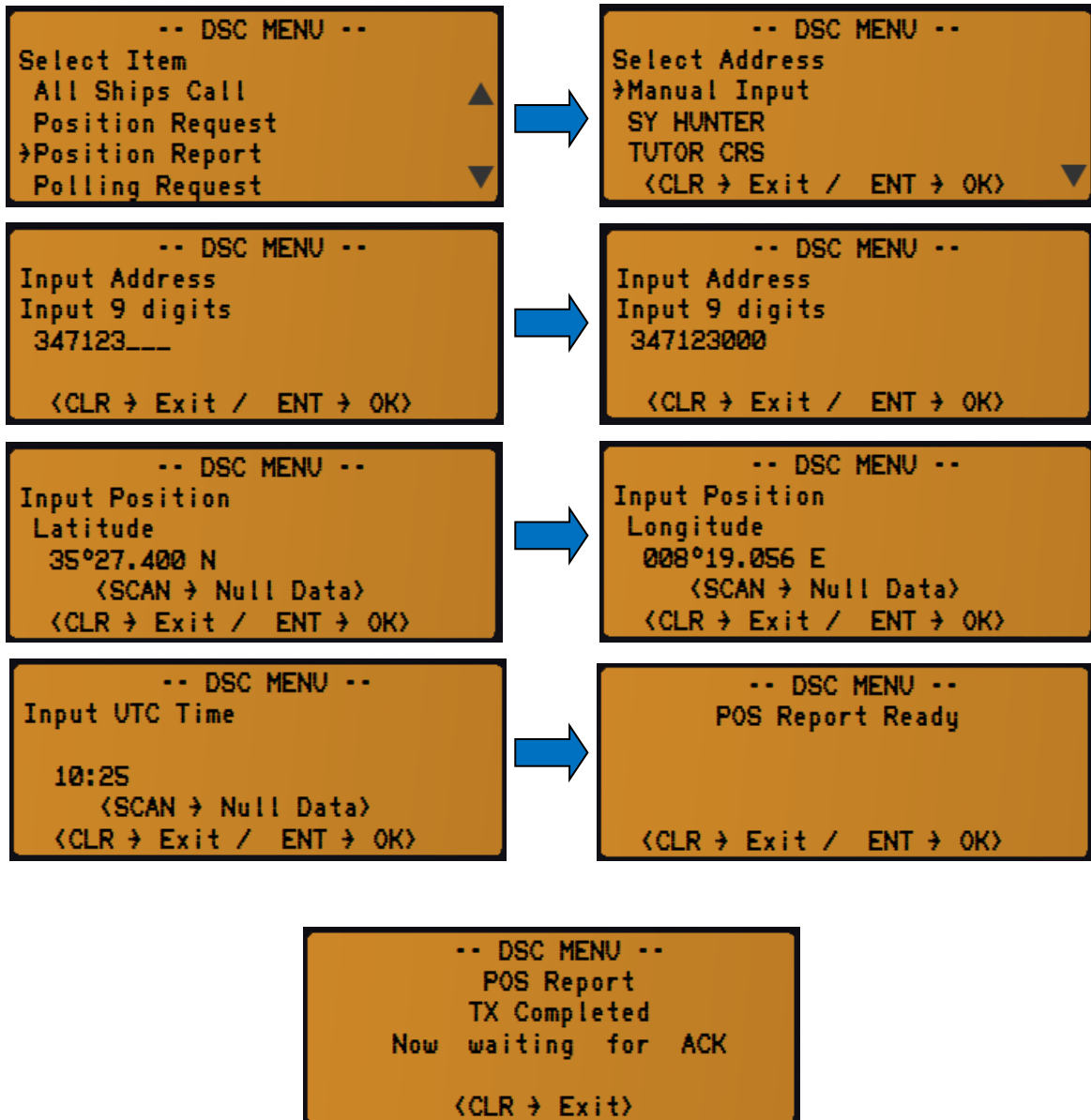


POSITION REPORT CALL

This feature is similar to the position request feature, however instead of requesting a position of another vessel, this function allows you to send your position to another vessel. In order to send your position it's necessary to have a GPS receiver connected or to have manually input your position.

POSITION REPORT – Manual MMSI entry

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <POSITION REPORT> then push **[ENT]**.
3. Push **[UP / DOWN]** keys to select <MANUAL INPUT> then push **[ENT]**.
4. Set the 9 digit MMSI number for the vessel you wish to call using **[UP / DOWN]** keys.
5. When a digit is set, push **[CH.DUAL]** to move to move to the next digit to be entered.
6. Repeat the procedure until all 9 space of the MMSI number which you want to contact are entered.
7. If a mistake was made entering the MMSI number, repeat pressing the **[CH.DUAL]** or **[16.C]** until the wrong digit is selected and then push **[UP / DOWN]** keys to correct the entry.
8. When all 9 digits are entered push the **[ENT]**.
9. Regardless of a GPS receiver connection, the current position / time information appear.
10. If it's not necessary to input or modify the information, push **[ENT]** several time to skip the data input steps.
11. Push **[CH.DUAL]** or **[16.C]** several time to move between each position's digit you need to replace.
12. Push **[UP / DOWN]** keys to edit N (North Latitude) or S (South Latitude) when cursor is on the N or S position.
13. Push **[UP / DOWN]** keys to edit W (West Longitude) or E (East Longitude) when cursor is on the W or E position.
14. Push **[SCAN]** for 1 second to null latitude / longitude data.
15. After setting the position data push **[ENT]** to set the UTC time.
16. Push **[CH.DUAL]** or **[16.C]** several time to move between each time digit you need to replace.
17. Push **[SCAN]** for 1 second to null the UTC time data.
18. Set the current UTC time using **[UP / DOWN]** keys then push **[ENT]**.
19. The <Position Report Ready> menu appear.
20. Push the **[ENT]** to transmit the position report to the selected station.
21. After the position report call has been transmitted, the radio wait for the acknowledgement from the other station.
22. Push the **[CLR]** key to revert to normal operation mode.

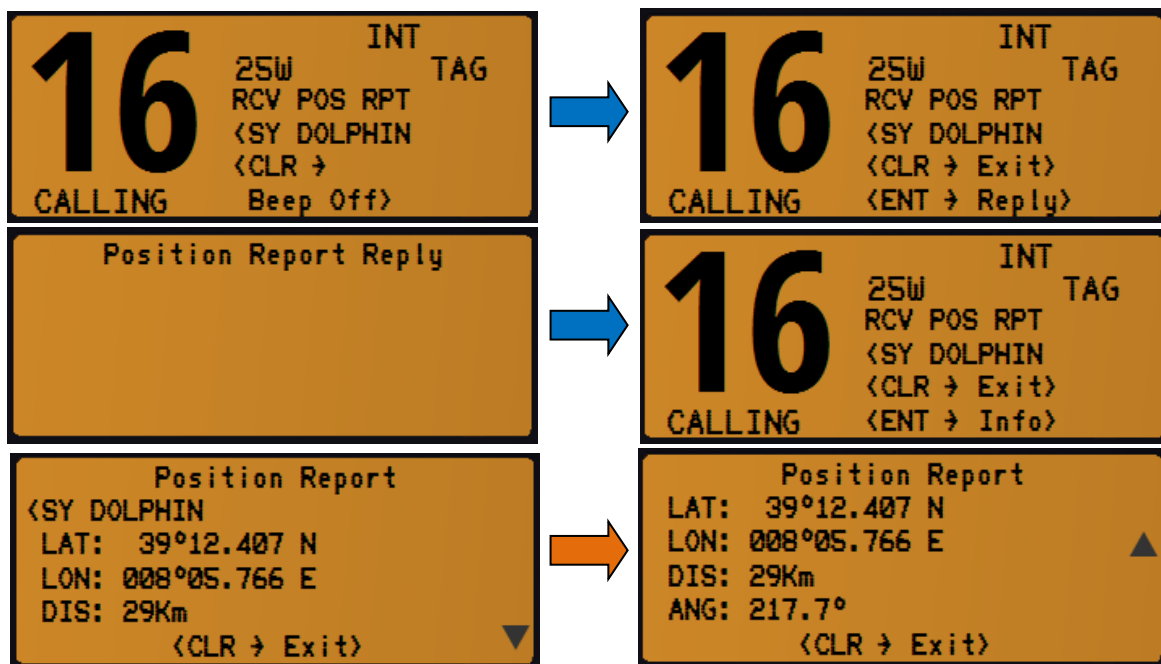


POSITION REPORT – Using Individual Call Directory

1. Push [**MENU**] key. The <DSC MENU> will appear.
2. Push [**UP / DOWN**] keys to select <POSITION REPORT> then push [**ENT**].
3. Push [**UP / DOWN**] keys to select the pre-programmed station address then push [**ENT**].
4. Perform steps 9 to 22 described on previous section to transmit your position to desired station.

RECEIVING A POSITION REPORT CALL

1. When a DSC Position Report call is received, <RCV POS RPT> appears a beep alarm sounds.
2. The display will show the MMSI or name of the reporting vessel.
3. Push [**CLR**] to stop the beep sound.
4. Push [**CLR**] to ignore the position report call and to revert to normal operation.
5. Push [**ENT**] to reply to the position report call.
6. Push [**ENT**] to show the position report call data of the other vessel.
7. Push [**UP / DOWN**] to show received position data.
8. Push [**CLR**] to resume normal operation.

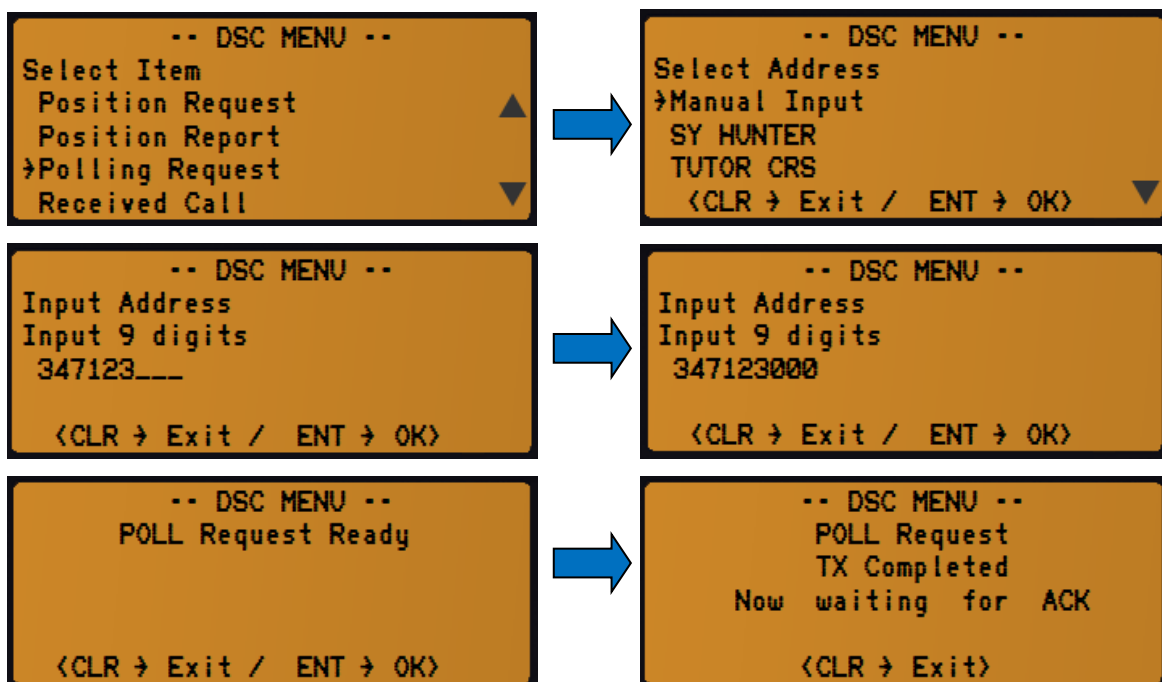


POLLING CALL

Transmit a DSC POLLING REQUEST CALL when you want to know if a specific ship is in the communication area, etc.

POLLING REQUEST – Manual MMSI entry

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <POLLING REQUEST> then push **[ENT]**.
3. Push **[UP / DOWN]** keys to select <MANUAL INPUT> then push **[ENT]**.
4. Set the 9 digit MMSI number for the vessel you wish to call using **[UP / DOWN]** keys.
5. When a digit is set, push **[CH.DUAL]** to move to the next digit to be entered.
6. Repeat the procedure until all 9 space of the MMSI number which you want to contact are entered.
7. If a mistake was made entering the MMSI number, repeat pressing the **[CH.DUAL]** or **[16.C]** until the wrong number is selected and then push **[UP / DOWN]** keys to correct the entry.
8. When all 9 digits are entered push the **[ENT]**.
9. The <Polling Request Ready> menu appear.
10. Push the **[ENT]** to transmit the polling request.
11. After the polling request call has been transmitted, the radio wait for the acknowledgement from the other station.
12. Push the **[CLR]** key to revert to normal operation mode.

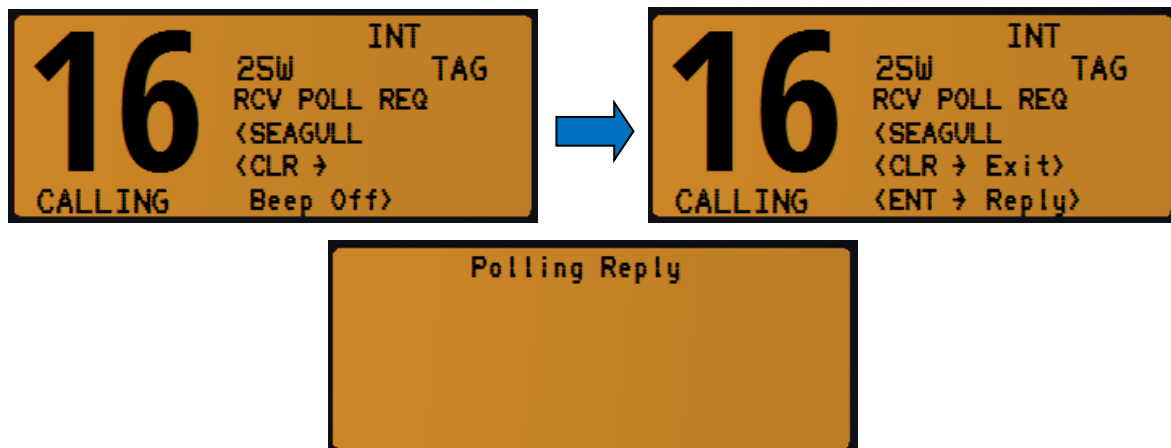


POLLING – Using Individual Call Directory

1. Push [**MENU**] key. The <DSC MENU> will appear.
2. Push [**UP / DOWN**] keys to select <POLLING REQUEST> then push [**ENT**].
3. Push [**UP / DOWN**] keys to select the pre-programmed station address then push [**ENT**].
4. Perform steps 9 to 21 described on previous section to transmit polling request to desired station.

RECEIVING A POLLING CALL

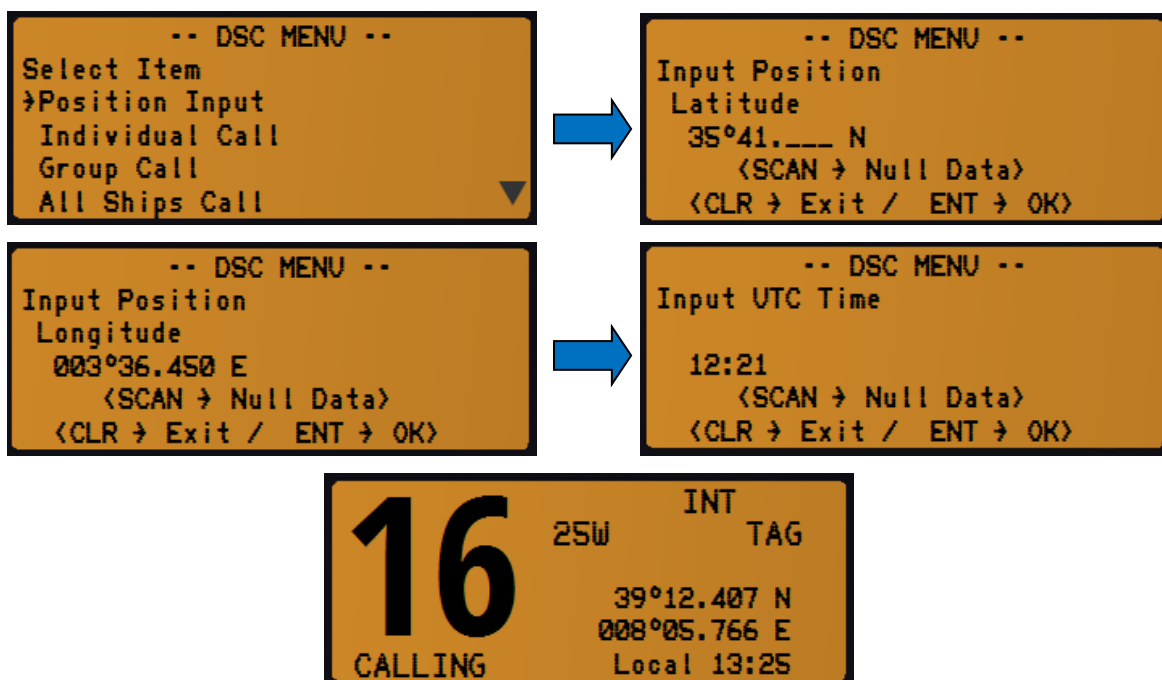
1. When a DSC Polling Request call is received, a ringing alarm sounds.
2. The display will show the MMSI or name of the requesting vessel.
3. Push [**CLR**] to stop the ringing sound.
4. Push [**CLR**] to ignore the polling request call and to revert to normal operation.
5. Push [**ENT**] to accept the polling request call and to reply to the other vessel.



MANUAL POSITION AND TIME PROGRAMMING

You may send the Latitude/Longitude of your vessel manually when a GPS receiver is not connected or is not functioning. After a position is entered, transmitting a DSC Distress or position report will contain the manually entered position.

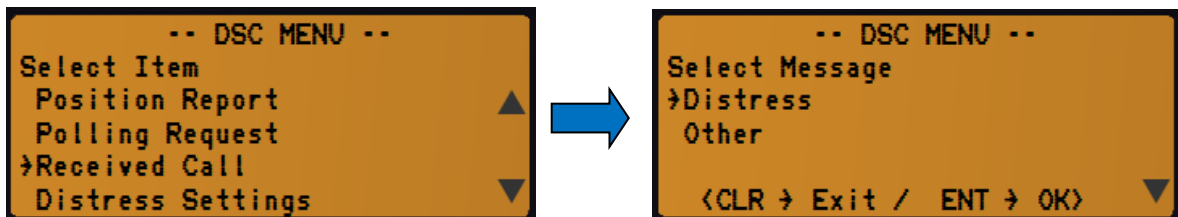
1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <POSITION INPUT> then push **[ENT]**.
3. Regardless of a GPS receiver connection, the current position / time information appears.
4. Set your position using **[UP / DOWN]** keys and push **[CH.DUAL]** to move to next digit.
5. If it's not necessary to input or modify the information, push **[ENT]** to skip the data input steps.
6. Push **[CH.DUAL]** or **[16.C]** several time to move cursor backward or forward, respectively.
7. Push **[UP / DOWN]** keys to edit N (North Latitude) or S (South Latitude) when cursor is on the N or S position.
8. Push **[UP / DOWN]** keys to edit W (West Longitude) or E (East Longitude) when cursor is on the W or E position.
9. Push **[SCAN]** for 1 second to null latitude / longitude data.
10. After setting the position data push **[ENT]** to set the UTC time.
11. Push **[CH.DUAL]** or **[16.C]** several time to move between each time digit you need to replace.
12. Push **[SCAN]** for 1 second to clear the UTC time data.
13. Set the current UTC time using **[UP / DOWN]** keys then push **[ENT]**.



RECEIVED MESSAGES

The IC-M421 automatically store up to 10 distress messages and 10 other messages as an assistance to the vessel's logbook.

1. Push **[MENU]** key. The <DSC MENU> will appear.
2. Push **[UP / DOWN]** keys to select <RECEIVED CALL> then push **[ENT]**.
3. The <Select Message> menu appears.
4. Push **[UP / DOWN]** keys to select desired message's category and push **[ENT]**.
5. Push **[UP / DOWN]** keys to select desired message and push **[ENT]**.
6. Push **[UP / DOWN]** keys to scroll the entire message.
7. Push **[CLR]** to go back one step in to the menu.
8. Push **[ENT]** to revert the radio to normal operation.



VOICE CALLING PROCEDURES

DISTRESS CALL

1. Transmit a DSC Distress Alert, containing if possible the nature of distress and your position.
2. Wait briefly (30 sec) for a Distress Acknowledgment, usually from a CRS or MRCC.
3. Transmit a Distress Call, on CH-16 using voice radiotelephony.
4. Transmit a Distress Message, on CH-16 using voice radiotelephony.

Voice Distress Call:

- Mayday (3x)
- This is
- Vessel Name (3x)
- Vessel Call Sign
- MMSI

Voice Distress Message:

- Mayday
- Vessel Name
- Vessel Call Sign
- MMSI
- Last know position (LAT/LON) or relative to any geographical reference.
- Time of validity of the position.
- Nature of distress.
- Requested help.
- Other useful information that may help rescue operation.
- OVER

Example:

MAYDAY MAYDAY MAYDAY
THIS IS
YACHT HOLIDAY HOLIDAY HOLIDAY
HBY5824 269235000

MAYDAY
YACHT HOLIDAY
HBY5824 269235000
POSITION 43 DEGREES 15 MINUTES NORTH
006 DEGREES 28 MINUTES EAST
AT 0845 UTC
THE SHIP IS SINKING
IMMEDIATE ASSISTANCE IS REQUIRED
THE SHIP IS A 46 FEET SAILING YACHT SLOOP DARK BLUE HULL
6 PERSONS ON BOARD
LAST COURSE 170 DEGREES SPEED FIVE KNOTS
OVER

DISTRESS ACKNOWLEDGEMENT CALL

The international Radio Regulations RR state that usually a DSC Distress Acknowledgment shall be transmitted only by a Coast station or by a MRCC.

If a vessel receive a DSC Distress Call and / or a voice Distress Call shall:

- Listen on the distress channel for the Distress Traffic and take note of the content.
- If after 5 minutes, no Distress Acknowledgment has been transmitted by a SRC or MRCC, proceed with a Distress Acknowledgement using voice radiotelephony.
- Try to contact a CRS or MRCC with any method to inform them about situation.

Voice Distress Acknowledgment:

- MAYDAY
- NAME OF THE DISTRESS VESSEL or;
- MMSI or;
- ANY OTHER DISTRESSED VESSEL IDENTIFICATION
- THIS IS VESSEL NAME
- CALL SIGN
- MMSI
- RECEIVED MAYDAY

Example:

MAYDAY
YACHT HOLIDAY
THIS IS YACHT LUCKY
HBY4247
269285000
RECEIVED MAYDAY

DISTRESS CALL RELAY

Distress Call relay to a land station

This is only broadcasted when a station learns that:

- Another vessel has transmitted a DSC Distress Call that is not confirmed by any station after 5 minutes; or
- Another vessel is in Distress and is unable to transmit the Distress Alert itself, (example: direct visual observation) and in opinion of the master further help is required.

Usually the VHF DSC radio installed on pleasure or small vessels, can't transmit a DSC Distress Alert Relay because the <Class D> DSC controller are not equipped with this function. The pleasure craft is then required to relay the distress call directly to a land station (CRS or MRCC) on an appropriate monitored working channel using Voice Radiotelephony.

- MAYDAY RELAY (3x)
- NAME OF CALLED STATION (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- OVER

Example:

MAYDAY RELAY MAYDAY RELAY MAYDAY RELAY
BREMEN RESCUE BREMEN RESCUE BREMEN RESCUE
THIS IS
YACHT DOLPHIN DOLPHIN DOLPHIN HBY 3585
OVER

When Bremen Rescue answer the call and request to continue with the <Go Ahead>:

BREMEN RESCUE THIS IS SAILING YACHT DOLPHIN HBY 3585
POSITION 28 DEGREES 12 MINUTES NORTH 030 DEGREES 15 MINUTES EAST AT
0645 UTC
WE OBSERVED AN UNIDENTIFIED TRAWLER SINKING ABOUT 3 NAUTICAL MILES
SOUTHEAST OF OUR REPORTED POSITION WE ARE HEADING TO THE TRAWLER
WE REQUEST IMMEDIATE ADDITIONAL ASSISTANCE FROM ASHORE AND OTHER
SHIPS IN VICINITY
OVER

Distress Call relay to All Stations

In case no land station (CRS or MRCC) can be directly contacted and alarmed, the master may transmit a Distress Call Relay to All Stations using Voice Radiotelephony on CH-16.

- MAYDAY RELAY (3x)
- ALL STATIONS (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- WE RECEIVED FOLLOWING DISTRESS MESSAGE
- AT UTC ON CHANNEL
- OVER

Example:

MAYDAY RELAY MAYDAY RELAY MAYDAY RELAY
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS
YACHT DOLPHIN DOLPHIN DOLPHIN HBY3585
WE RECEIVED THE FOLLOWING DISTRESS MESSAGE AT 0700 UTC ON CHANNEL 16
MAYDAY YACHT HOLIDAY HBY5824 269235000
POSITION 43 DEGREES 15 MINUTES NORTH 006 DEGREES 28 MINUTES EAST
AT 0645 UTC
THE SHIP IS SINKING
IMMEDIATE ASSISTANCE IS REQUIRED
THE SHIP IS A 46 FEET SAILING YACHT SLOOP DARK BLUE HULL
6 PERSONS ON BOARD LAST COURSE 170 SPEED FIVE KNOTS
OVER

CANCELLING A FALSE DISTRESS CALL

If a vessel transmit a false DSC Distress Call, this should be immediately cancelled !

- If the <CANCEL> function is available on the radio, this should be used as soon as possible.
- Power cycle the radio OFF and ON to stop the automatic alarm re-transmission.
- Transmit the Distress Cancel message on the CH-16.

Voice Distress Cancel Message:

- ALL STATIONS (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- MMSI
- PLEASE CANCEL MY DISTRESS ALERT OF UTC
- OVER

Example:

ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS
SAILING YACHT TROUBLE TROUBLE TROUBLE
HBY2854 269432000
PLEASE CANCEL MY DISTRESS ALERT OF 0700 UTC
OVER

URGENCY CALL

- There is no DSC Acknowledgment for a DSC Urgency Call transmitted to All SHIPS.
- Transmit the Urgency Call and Message using Voice Radiotelephony on CH-16.
- If CH-16 is being used for a Distress Traffic, the Urgency Call and Message must be delayed until the Distress Traffic is over or must be addressed directly to a CRS or MRCC using a working channel of the land station.

Voice Urgency Message:

- PAN PAN (3x)
- ALL STATIONS (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- MMSI
- LAST KNOWN POSITION (LAT/LON) OR ANY GEOGRAPHICAL REFERENCE.
- TIME OF VALIDITY OF THE POSITION.
- URGENCY MESSAGE.
- OVER

Example:

PAN PAN PAN PAN PAN PAN
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS
SAILING YACHT DOLPHIN DOLPHIN DOLPHIN
HBY2854 269432000
POSITION 43 DEGREES 15 MINUTES NORTH 006 DEGREES 28 MINUTES EAST
AT 0845 UTC
OUR RUDDER IS BROKEN AND WE ARE DRIFTING SLOWLY IN TO DANGER
WE NEED TOWING ASSISTANCE
OVER

CANCELLING AN URGENCY CALL

When an urgency announcement or call and message was transmitted to more than one station and action is no longer required, an urgency cancellation should be sent by the station responsible for its transmission, using voice radiotelephony.

Voice Urgency Cancel Message:

- PAN PAN (3x)
- ALL STATIONS (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- MMSI
- URGENCY CANCELLATION MESSAGE.
- OVER

Example:

```
PAN PAN PAN PAN PAN PAN  
ALL STATIONS ALL STATIONS ALL STATIONS  
THIS IS  
SAILING YACHT DOLPHIN DOLPHIN DOLPHIN  
HBY2854 269432000  
PLEASE CANCEL MY URGENCY MESSAGE OF 0725 UTC  
OVER
```

SAFETY CALL

- There is no DSC Acknowledgment for a DSC Safety Call transmitted to All SHIPS.
- Transmit the Safety Call and Message using Voice Radiotelephony on CH-16.
- If CH-16 is being used for a Distress or Urgency Traffic, the Safety Call and Message must be delayed until the Distress Traffic is over or must be addressed directly to a CRS or MRCC using a working channel of the land station.

Voice Safety Message:

- SECURITE (3x)
- ALL STATIONS (3x)
- THIS IS
- VESSEL NAME (3x)
- CALL SIGN
- MMSI
- LAST KNOWN POSITION (LAT/LON) OR ANY GEOGRAPHICAL REFERENCE.
- TIME OF VALIDITY OF THE POSITION.
- SAFETY MESSAGE.
- OVER

Example:

SECURITE SECURITE SECURITE
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS
SAILING YACHT DOLPHIN DOLPHIN DOLPHIN
HBY2854 269432000
3 NAUTICAL MILES SOUTH OF CAPE FANTASY
WE OBSERVED A DRIFTING YELLOW CONTAINER DANGEROUS FOR NAVIGATION
SHIPS IN VICINITY PLEASE NAVIGATE CAREFULLY
OVER

Source: Federal Office of Communications, UFCOM/BAKOM, Switzerland (www.bakom.admin.ch),

Not_Dringlichkeit_Sicherheit_i.pdf