



INSTRUCTION MANUAL

VHF MARINE TRANSCEIVER

IC-M422



Icom Inc.

FOREWORD

Thank you for purchasing this Icom product. The IC-M422 VHF MARINE TRANSCEIVER is designed and built with Icom's state of the art technology and craftsmanship. With proper care, this product should provide you with years of trouble-free operation.

We want to take a couple of moments of your time to thank you for making the IC-M422 your radio of choice, and hope you agree with Icom's philosophy of "technology first." Many hours of research and development went into the design of your IC-M422.

◇ **FEATURES**

- *Simple operation with large keys*
- *Easy to hear speaker*
- *Built-in DSC meets RTCM SC101 requirement*
- *Rugged waterproof construction*
- *Optional COMMANDMIC II™*

Icom, Icom Inc. and the ICOM logo are registered trademarks of Icom Incorporated (Japan) in the United States, the United Kingdom, Germany, France, Spain, Russia and/or other countries.


COMMANDMIC II is a trademark of Icom Incorporated (Japan) in the United States.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS INSTRUCTION MANUAL — This instruction manual contains important operating instructions for the IC-M422.

EXPLICIT DEFINITIONS

WORD	DEFINITION
 WARNING!	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	Recommended for optimum use. No risk of personal injury, fire or electric shock.

CLEAN THE TRANSCEIVER AND MICROPHONE THOROUGHLY WITH FRESH WATER after exposure to water including salt water, otherwise, the keys and switches may become inoperable due to salt crystallization.

IN CASE OF EMERGENCY

If your vessel requires assistance, contact other vessels and the Coast Guard by sending a Distress call on Channel 16.

USING CHANNEL 16

DISTRESS CALL PROCEDURE

1. "MAYDAY MAYDAY MAYDAY."
2. "THIS IS" (name of vessel)
3. Your call sign or other indication of the vessel (AND 9-digit DSC ID if you have one).
4. "LOCATED AT" (your position)
5. The nature of the distress and assistance required.
6. Any other information which might facilitate the rescue.

Or, transmit your Distress call using digital selective calling on Channel 70.

USING DIGITAL SELECTIVE CALLING (Ch 70)

DISTRESS CALL PROCEDURE

1. While lifting up the key cover, push and hold **[DISTRESS]** for 5 sec. until you hear 5 short beeps change to one long beep.
2. Wait for an acknowledgment on Channel 70 from a coast station.
 - After the acknowledgement is received, Channel 16 is automatically selected.
3. Push and hold **[PTT]**, then transmit the appropriate information as listed above.

NOTE

A WARNING STICKER is supplied with the transceiver. To comply with FCC regulations, this sticker must be affixed in such a location as to be readily seen from the operating controls of the radio as in the diagram below. Make sure the chosen location is clean and dry before applying the sticker. (p. 36)

EXAMPLE



RADIO OPERATOR WARNING



Icom requires the radio operator to meet the FCC Requirements for Radio Frequency Exposure. An omnidirectional antenna with gain not greater than 9 dBi must be mounted a minimum of 5 meters (measured from the lowest point of the antenna) vertically above the main deck and

all possible personnel. This is the minimum safe separation distance estimated to meet all RF exposure compliance requirements. This 5 meter distance is based on the FCC Safe Maximum Permissible Exposure (MPE) distance of 3 meters added to the height of an adult (2 meters) and is appropriate for all vessels.

For watercraft without suitable structures, the antenna must be mounted so as to maintain a minimum of 1 meter vertically between the antenna, (measured from the lowest point of the antenna), to the heads of all persons AND all persons must stay outside of the 3 meter MPE radius.

Do not transmit with radio and antenna when persons are within the MPE radius of the antenna, unless such persons (such as driver or radio operator) are shielded from antenna field by a grounded metallic barrier. The MPE Radius is the minimum distance from the antenna axis that person should maintain in order to avoid RF exposure higher than the allowable MPE level set by FCC.

FAILURE TO OBSERVE THESE LIMITS MAY ALLOW THOSE WITHIN THE MPE RADIUS TO EXPERIENCE RF RADIATION ABSORPTION WHICH EXCEEDS THE FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMIT. IT IS THE RESPONSIBILITY OF THE RADIO OPERATOR TO ENSURE THAT THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS ARE OBSERVED AT ALL TIMES DURING RADIO TRANSMISSION. THE RADIO OPERATOR IS TO ENSURE THAT NO BYSTANDERS COME WITHIN THE RADIUS OF THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS.

Determining MPE Radius

THE MAXIMUM PERMISSIBLE EXPOSURE (MPE) RADIUS HAS BEEN ESTIMATED TO BE A RADIUS OF ABOUT 3M PER OET BULLETIN 65 OF THE FCC. THIS ESTIMATE IS MADE ASSUMING THE MAXIMUM POWER OF THE RADIO AND ANTENNAS WITH A MAXIMUM GAIN OF 9dBi ARE USED FOR A SHIP MOUNTED SYSTEM.

TABLE OF CONTENTS

FOREWORD	i	6 DSC OPERATION	13–29	12 COMMANDMIC II™ HM-157 ...	40–53
IMPORTANT	i	■ MMSI code programming	13	■ Panel description	40
EXPLICIT DEFINITIONS	i	■ MMSI code check	13	■ Function display	42
IN CASE OF EMERGENCY	ii	■ DSC Address ID	14	■ Channel selection	44
NOTE	ii	■ Position indication	15	■ Receiving and transmitting	45
RADIO OPERATOR WARNING.....	iii	■ Distress call	16	■ Call channel programming	46
TABLE OF CONTENTS	iv	■ Transmitting DSC calls.....	17	■ Lock functions	46
PRECAUTIONS	v	■ Receiving DSC calls	26	■ Display backlight	47
1 OPERATING RULES	1	7 OTHER FUNCTIONS	30–31	■ Monitor function.....	47
2 PANEL DESCRIPTION	2–4	■ Intercom operation	30	■ Dualwatch/Tri-watch operation ...	47
■ Front panel	2	■ Public Address (PA) function	31	■ Setting TAG channels	48
■ Microphone	3	■ RX Speaker function	31	■ Starting a scan	48
■ Function display	4	8 SET MODE	32–34	■ Set mode programming	49
3 BASIC OPERATION	5–9	■ Set mode programming	32	■ Intercom operation	50
■ Channel selection	5	■ Set mode items	32	■ Public Address function	50
■ Receiving and transmitting	7	9 CONNECTIONS AND		■ RX Speaker function	50
■ Call channel programming.....	8	MAINTENANCE	35–37	■ Channel comments	51
■ Channel comments	9	■ Connections	35	■ HM-157 supplied accessories.....	51
■ Microphone Lock function	9	■ Supplied accessories	36	■ Installation	52
■ Display backlight	9	■ Antenna	36	13 CHANNEL LIST	54
4 SCAN OPERATION	10–11	■ Fuse replacement	36	14 TEMPLATE	55
■ Scan types	10	■ Mounting the transceiver	36		
■ Setting TAG channels	11	■ Optional MB-69 installation	37		
■ Starting a scan	11	10 TROUBLESHOOTING.....	38		
5 DUALWATCH/TRI-WATCH.....	12	11 SPECIFICATIONS AND			
■ Description	12	OPTIONS	39		
■ Operation	12	■ Specifications	39		
		■ Options	39		

PRECAUTIONS

⚠ WARNING! NEVER connect the transceiver to an AC outlet. This may pose a fire hazard or result in an electric shock.

CAUTION: Changes or modifications to this device, not expressly approved by Icom Inc., could void your authority to operate this device under FCC regulations.

NEVER connect the transceiver to a power source of more than 16 V DC or use reverse polarity. This will ruin the transceiver.

NEVER cut the DC power cable between the DC plug at the back of the transceiver and fuse holder. If an incorrect connection is made after cutting, the transceiver may be damaged.

NEVER place the transceiver where normal operation of the vessel may be hindered or where it could cause bodily injury.

KEEP the transceiver at least 3.3 ft (1 m) away from the ship's navigation compass.

DO NOT use or place the transceiver in areas with temperatures below -4°F (-20°C) or above $+140^{\circ}\text{F}$ ($+60^{\circ}\text{C}$) or, in areas subject to direct sunlight, such as the dashboard.

AVOID the use of chemical agents such as benzine or alcohol when cleaning, as they may damage the transceiver surfaces. If the transceiver becomes dusty or dirty, wipe it clean with a soft, dry cloth.

BE CAREFUL! The transceiver rear panel will become hot when operating continuously for long periods.

Place the transceiver in a secure place to avoid inadvertent use by children.

BE CAREFUL! The transceiver and the optional HM-157 COMMANDMICII™ employ waterproof construction, which corresponds to IPX7 of the international standard IEC 60529 (2001). However, once the transceiver or microphone has been dropped, waterproofing cannot be guaranteed due to the fact that the case may be cracked, or the waterproof seal damaged, etc.

◆ PRIORITIES

- Read all rules and regulations pertaining to priorities and keep an up-to-date copy handy. Safety and Distress calls take priority over all others.
- You must monitor Channel 16 when you are not operating on another channel.
- False or fraudulent distress signals are prohibited and punishable by law.

◆ PRIVACY

- Information overheard but not intended for you cannot lawfully be used in any way.
- Indecent or profane language is prohibited.

◆ RADIO LICENSES

(1) SHIP STATION LICENSE

You must have a current radio station license before using the transceiver. It is unlawful to operate a ship station which is not licensed.

Inquire through your dealer or the appropriate government agency for a Ship-Radiotelephone license application. This government-issued license states the call sign which is your craft's identification for radio purposes.

(2) OPERATOR'S LICENSE

A Restricted Radiotelephone Operator Permit is the license most often held by small vessel radio operators when a radio is not required for safety purposes.

The Restricted Radiotelephone Operator Permit must be posted or kept with the operator. Only a licensed radio operator may operate a transceiver.

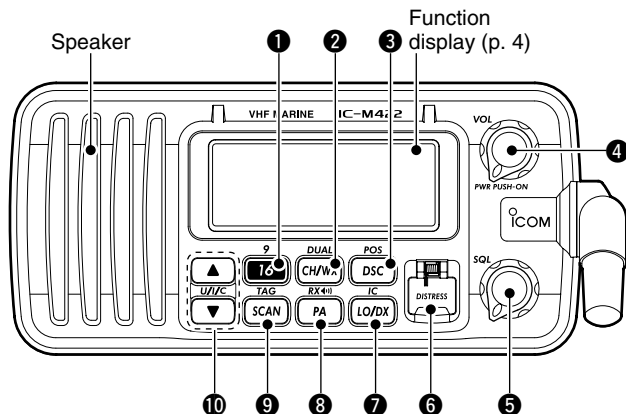
However, non-licensed individuals may talk over a transceiver if a licensed operator starts, supervises, ends the call and makes the necessary log entries.

Keep a copy of the current government rules and regulations handy.

Radio license for boaters (U.S.A. only)

The Telecommunications Act of 1996 permits recreational boaters to have and use a VHF marine radio, EPIRB, and marine radar without having an FCC ship station license. Boaters traveling on international voyages, having an HF single sideband radiotelephone or marine satellite terminal, or required to carry a marine radio under any other regulation must still carry an FCC ship station license. For further information, see the FCC Ship Radio Stations Fact Sheet.

■ Front panel



① CHANNEL 16/CALL CHANNEL KEY [16•9]

- ➔ Push to select Channel 16. (p. 5)
- ➔ Push for 1 sec. to select Call channel. (p. 5)
 - “CALL” appears when Call channel is selected.
- ➔ Push for 3 sec. to enter Call channel programming condition when Call channel is selected. (p. 8)
- ➔ While pushing [CH/WX•DUAL], push to enter the channel comment programming condition. (p. 9)
- ➔ Move the cursor backward while in the channel comment programming condition. (p. 9)
- ➔ While turning power ON, push to enter Set mode. (p. 32)

② CHANNEL/WEATHER CHANNEL KEY [CH/WX•DUAL]

- ➔ Selects and toggles the regular channel and Weather channel when pushed momentarily. (p. 6)
- ➔ Push for 1 sec. to start Dualwatch or Tri-watch. (p. 12)
- ➔ Push to stop Dualwatch or Tri-watch when either is activated. (p. 12)
- ➔ Advance the cursor while in the channel comment programming condition. (p. 9)

③ DSC/POSITION KEY [DSC•POS]

- ➔ Push to select the DSC menu. (p. 13)
- ➔ Push for 1 sec. to show the current position from a GPS receiver. (p. 15)

④ POWER/VOLUME CONTROL [VOL] (p. 7)

- ➔ Push for 2 sec. to turn power ON and OFF.
- ➔ Rotate to adjust the audio level.

⑤ SQUELCH CONTROL [SQL]

- ➔ Rotate to set the squelch threshold level. (p. 7)

⑥ DISTRESS KEY [DISTRESS]

- ➔ Push for 5 sec. to transmit a Distress call. (p. 16)

⑦ ATTENUATOR/INTERCOM KEY [LO/DX•IC]

- ➔ Push to toggle the Attenuator function ON or OFF. (p. 7)
 - “LOC” appears when the Attenuator function is turned ON.
- ➔ Push for 1 sec. to activate an optional Intercom function. (p. 30)
- ➔ Push and hold to calls the optional HM-157 COMMAND-MIC II™ while in Intercom mode. (p. 30)

8 PUBLIC ADDRESS/RX SPEAKER KEY [PA•RX ◀▶]

- ➔ Push to turn the Public Address mode ON or OFF. (p. 31)
- ➔ Push for 1 sec. to turn the RX Speaker mode ON or OFF. (p. 31)

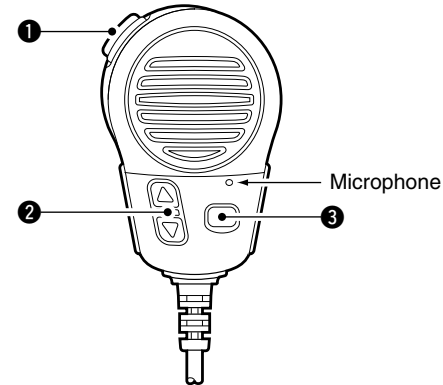
9 SCAN KEY [SCAN•TAG] (p. 11)

- ➔ Push to start and stop Normal or Priority scan.
- ➔ Push for 1 sec. to set or clear the displayed channel as a TAG (scanned) channel.
- ➔ While pushing [HI/LO] on the microphone, push for 3 sec. to clear or set all TAG channels in the selected channel group.

10 CHANNEL UP/DOWN KEYS [▲]/[▼]•[U/I/C]

- ➔ Push to select the operating channels, Set mode settings, etc. (pgs. 5, 6, 32)
- ➔ Push and hold [▲] to move upward through the operating channels continuously.
- ➔ Push and hold [▼] to move downward through the operating channels continuously.
- ➔ While pushing [SCAN•TAG], push [▲] or [▼] to adjust the brightness of the LCD and key backlight. (p. 9)
- ➔ Push both keys to select one of three channel groups in sequence. (p. 6)
 - U.S.A., International and Canadian channels are available.
- ➔ Checks TAG channels, changes scanning direction or resumes the scan manually during scan. (p. 11)
- ➔ Push [▲] or [▼] to adjust the audio level in Public Address mode. (p. 31)
- ➔ While pushing [PA•RX ◀▶], push [▲] or [▼] to adjust the audio level in RX Speaker mode. (p. 31)

■ Microphone



1 PTT SWITCH [PTT]

Push and hold to transmit; release to receive. (p. 7)

2 CHANNEL UP/DOWN KEYS [▲]/[▼]

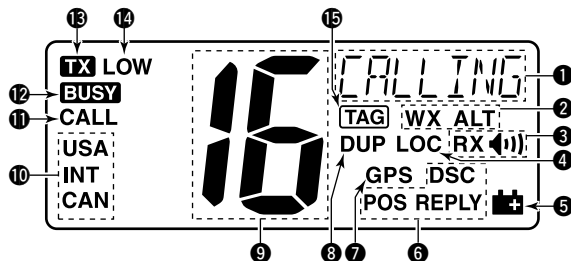
- ➔ Push either key to change the operating memory channel, Set mode settings, etc. (pgs. 5, 6, 32)
- ➔ Checks TAG channels, changes scanning direction or resumes the scan manually during scan. (p. 11)

3 TRANSMIT POWER KEY [HI/LO]

- ➔ Toggles power high and low when pushed. (p. 7)
 - Some channels are set to low power only.
- ➔ While pushing [HI/LO], turn power ON to toggle the Microphone Lock function ON and OFF. (p. 9)

2 PANEL DESCRIPTION

■ Function display



① CHANNEL COMMENT INDICATOR

- ➔ Channel comment appears and scrolls if programmed. (p. 9)
- ➔ “*DW*” or “*TW*” blinks during Dualwatch or Tri-watch, respectively. (p. 12)
- ➔ “*SCAN 16*” or “*SCAN*” appears during Priority or Normal scan, respectively. (p. 11)
- ➔ In Set mode, indicates and scrolls the selected item. (p. 9)

② WEATHER CHANNEL INDICATOR (pgs. 6, 33)

- ➔ “*WX*” appears when a weather channel is selected.
- ➔ “*WX ALT*” appears when the Weather Alert function is in use; blinks when an alert tone is received.

③ RX SPEAKER INDICATOR (p. 31)

- Appears during the RX Speaker mode.

④ LOCAL INDICATOR (p. 7)

- Appears when the Attenuator function is turned ON.

⑤ LOW BATTERY INDICATOR

- Appears when the battery voltage drops to approx. 10 V DC or below.

⑥ DSC INDICATOR

- Indicates the DSC status.

- “*DSC*” appears when a DSC call is received. (pgs. 25, 26)
- “*POS REPLY*” appears when a Position Request Reply call or Position Report Reply call is received. (pgs. 28, 29)

⑦ GPS INDICATOR

- ➔ Appears while valid position data is received.
- ➔ Blinks when invalid position data is received.
- ➔ Disappears when no GPS receiver is connected.

⑧ DUPLEX INDICATOR (p. 6)

- Appears when a duplex channel is selected.

⑨ CHANNEL NUMBER READOUT

- ➔ Indicates the selected operating channel number.
 - “*F*” appears when a simplex channel is selected. (p. 6)
- ➔ In Set mode, indicates the selected condition. (p. 32)

⑩ CHANNEL GROUP INDICATOR (p. 6)

- Indicates whether a U.S.A. “*USA*,” International “*INT*” or Canadian “*CAN*” channel is in use.

⑪ CALL CHANNEL INDICATOR (p. 5)

- Appears when the call channel is selected.

⑫ BUSY INDICATOR (p. 7)

- Appears when receiving a signal or when the squelch opens.

⑬ TRANSMIT INDICATOR (p. 7)

- Appears while transmitting.

⑭ LOW POWER INDICATOR (p. 7)

- Appears when low power is selected.

⑮ TAG CHANNEL INDICATOR (p. 11)

- Appears when a TAG channel is selected.

Count on us!

A-6431D-1US-④

Printed in Japan

© 2005–2006 Icom Inc.

Printed on recycled paper with soy ink.

Icom Inc.

1-1-32 Kamiminami, Hirano-ku, Osaka 547-0003, Japan