



VHF/MARINE/RADIOTELEPHONE

# IC-M5

OWNERS MANUAL



ICOM INCORPORATED

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## SECTION I INTRODUCTION

### SYNTHESIZED HANDHELD TRANSCEIVER

The ICOM IC-M5 is a very compact VHF synthesized handheld transceiver. Using the latest in electronic design, the IC-M5 offers key-board frequency selection. The IC-M5 covers all U.S. and International channels and 10 WEATHER channels.

The Channel 16 PRIORITY button gives instant access to that channel. Offering rugged construction, extreme stability and frequency accuracy, the IC-M5 will give you years of trouble-free operation.

### VARIOUS POWER PACKS AVAILABLE

The Power Pack is slipped on the bottom of the radio very easily, and various power packs are available to suit your needs, for minimum size, higher power or longer use.

### HIGHLY EFFICIENT FLEXIBLE ANTENNA

A highly efficient flexible antenna is supplied with the set. Since the IC-M5 uses a standard BNC-type connector an external antenna may be easily substituted for the flexible antenna.

### MOISTURE PROOF

When the belt clip screws and rainproof cap for the top panel are in place, the IC-M5 is splash resistant.

## SECTION II SPECIFICATIONS

### GENERAL

|                          |  |               |
|--------------------------|--|---------------|
| Number of Semiconductors | Transistors  | 40            |
|                          | FET  | 3             |
|                          | IC   | 8             |
|                          | Diodes   | 20            |
| Number of Channels       | All U.S.A. and International channels and 10 Weather channels (Auxiliary Priority channels available)<br>Operation: Simplex, Semi-duplex                                     |               |
| Channel Spacing          | 25 KHz   |               |
| Frequency Stability      | 0.0005 Percent   |               |
| Usable Temperature       | -20 Degrees C to 60 Degrees C (-4 Degrees F to 140 Degrees F)  |               |
| Antenna Impedance        | 50 ohms unbalanced   |               |
| Power Supply Requirement | DC 13.2V; with attendant power pack IC-CM7, DC 6 to 15V negative ground is acceptable  |               |
| Current Drain at 13.2V   | Transmitting   |               |
|                          | At 5 watts output  | Approx. 1.45A |
|                          | Receiving  |               |
|                          | At max audio output  | Approx. 140mA |
|                          | Squelched  | Approx. 35mA  |
| Dimensions               | 118(129)mm(H) x 65(74)mm(W) x 35(41)mm(D) without power pack<br>Attendant power pack, IC-CM7: 80mm(H) x 65mm(W) x 35mm(D)<br>( ); Shows the dimensions including projections |               |
| Weight                   | 590g including power pack, IC-CM7 and flexible antenna   |               |

## RECEIVER

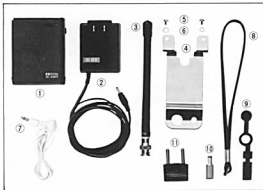
|                                   |  |
|-----------------------------------|--|
| Frequency Range                   | 156.025 ~ 157.425MHz and 160.625 ~ 163.275MHz                              |
| Receiving System                  | Double-conversion superheterodyne  |
| Modulation Acceptance             | 16F <sub>3</sub> ±7.5KHz (F3E 16K0)  |
| Intermediate Frequency            | 1st: 16.9MHz<br>2nd: 455KHz  |
| Sensitivity                       | Less than 0.3μV for 20dB Noise quieting<br>Less than 0.25μV for 12dB SINAD |
| Squelch Sensitivity               | Less than 0.1μV  |
| Spurious response rejection ratio | More than 60dB   |
| Selectivity                       | More than 65dB at adjacent channel   |
| Intermodulation Rejection Ratio   | More than 60dB   |
| Audio Output Power                | More than 500mW at 10% distortion  |
| Audio Output Impedance            | 8 ohms   |

## TRANSMITTER

|                          |  |
|--------------------------|--|
| Frequency Range          | 156.025 ~ 157.425MHz   |
| Output Power             | Hi: 5 watts, Low: 1 watt<br>(Hi: 2.5 watts, Low: 1 watt with IC-CM8 8.4V battery)                              |
| Emission Mode            | 16F <sub>3</sub> (F3E 16K0)  |
| Modulation System        | Variable reactance frequency modulation  |
| Max. Frequency Deviation | ±5KHz  |
| Spurious Emission        | More than 60dB below carrier   |
| Microphone               | Built-in Electret condenser microphone<br>Optional Speaker-microphone (IC-CM9) and Headset (HS-10) can be used |

## SECTION III ACCESSORIES

Carefully remove your transceiver from the packing carton and examine it for signs of shipping damage. Should any be apparent, notify the delivering carrier or dealer immediately, stating the full extent of the damage. It is recommended that you keep the shipping cartons. In the event storage, moving, or reshipment becomes necessary, they come in handy. Various accessories are packed with the transceiver. Make sure you have not overlooked anything.



1. Power pack IC-CM7 . . . . 1  
(attached to the set)
2. Wall charger CM-16U/E\* . . . 1
3. Flexible antenna . . . . . 1
4. Belt clip. . . . . 1
5. Belt clip retaining screws. 2
6. Plastic washers . . . . . 2
7. Earphone. . . . . 1
8. Hand-strap. . . . . 1
9. Rainproof cap. . . . . 1
10. DC Power plug . . . . . 1
11. AC conversion plug\*\* . . . 1

\* CM-16U for 117V AC  
CM-16E for 240V AC

\*\* 117V AC version is not included.

## SECTION IV PRE-OPERATION

### BATTERY INSTALLATION

The supplied IC-CM7 NiCd POWER PACK is rechargeable and can be charged with the supplied CM-16U/E WALL CHARGER, optional CM-35 DESK CHARGER, or a 12V battery using the optional IC-CM1 cable. Before using the power pack, charge it for 15 hours with the CM-16U/E or 1.5 hours with the CM-35.

After charging is completed, the batteries can be used in the same manner as dry cells. However, the voltage of Nickel-Cadmium batteries drops rapidly just before they are exhausted, so when the battery exhausting indicator on the channel display is present, be sure to stop operating, and recharge the batteries.

When operating the transceiver in environments where re-charging is difficult or impossible, the optional CM-12 BATTERY PACK is recommended for use. See page 41 OPTIONS.

### HOW TO CHARGE (When using Nickel-Cadmium power pack IC-CM7)

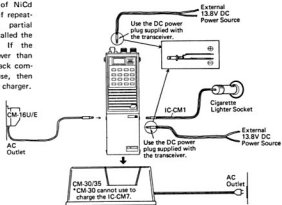
1. Use the supplied CM-16U/E WALL CHARGER, optional CM-35 DESK CHARGER, or a stable power source with an output voltage of 13.8V DC and current capacity over 100mA, or use a 12V battery with the optional IC-CM1 cable. (Output voltage of 12 ~ 15V can be used, but output voltage near the specified voltage should be used.)
2. The power switch of the transceiver must be OFF, or remove the power pack from the transceiver.

3. Connect the output plug of the wall charger (CM-16U/E), or other power source, to the charger socket of the power pack.

The charge indicator LED of the power pack is lit, which shows that the charger is working.

#### BATTERY PACK NOTE:

The full charge capacity of NiCd batteries may be reduced if repeatedly charged with only partial discharge periods. This is called the battery memory effect. If the battery capacity seems lower than when new, discharge the pack completely through normal use, then charge fully using the proper charger.



4. It takes about 15 hours to charge the batteries completely with CM-16U/E. This charger is designed for 0.1C (10-hour rate current). Charging for 15 hours compensates for any unbalance of the batteries. (It takes about 1.5 hours with CM-35)  
You should charge the batteries for 15 hours when you have not used them for a long time or after buying them.
5. Charge between 0°C and 40°C.
6. Avoid continuous charging as much as possible after full charging, (15 hours). If excess charging is repeated, the total life of the power pack is reduced.
7. After charging, unplug the power source from the charger socket of the power pack. The transceiver and the power pack are now ready for operation.

#### EXTERNAL POWER SOURCE

For use at home or for long periods, please use an external power source which assures you of stable communications without the concern of battery consumption.

1. Use either a regulated power supply or a battery of 13.8V DC and of over 1.5A current capability. (Though this transceiver may work from 5.5V to 16V DC, use it preferably at the rated voltage.) (The output power will be 5 watts.)
2. Correctly connect the external supply to the external DC power jack as shown in the figure. If polarity is reversed, source power is cut off by the protection circuit and the unit will not operate.



## PRECAUTIONS FOR USE OF THE NICKEL-CADMIUM BATTERIES (from the JIS C8705 MANUAL)

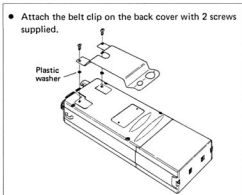
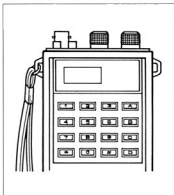
### General Cautions

1. Never short the power pack.  
Since internal resistance is low, excess shorted current flows away, causing the batteries or conductors to burn. Avoid shorts! The polarity is shown on the power pack.
2. Never solder the batteries directly.  
If the batteries are soldered directly, the separator or insulator may become melted and damaged. Accordingly, the terminal must be spot-welded first and then soldered.
3. Confirm polarities in order to prevent reverse charging.  
If they are charged in reverse, batteries may be damaged. Therefore confirmation of correct polarity is essential, to proper operation.
4. Never charge with excess charging current.  
If an excess charging rate is employed, gas consumption speed cannot keep up with gas generating speed at the time of charging. Batteries may be damaged by increasing internal pressure. Accordingly, the charging must be kept regulated.
5. Avoid charging under 0°C or over 40°C.  
Under 0°C, since gas consumption speed becomes lower at the charging time, inside pressure increases and hydrogen is generated. Since charging efficiency is reduced over 40°C, it is rather difficult to charge. Accordingly, charging must be done between 0°C and 40°C.
6. Never put batteries into fire.  
Since there may be a little gas left in the batteries, internal pressure increases suddenly and the batteries explode if thrown into a fire. Also, battery electrolyte is ejected and can cause damage to skin and clothes.

## FOR USE

1. Attach the supplied power pack. (Refer to "BATTERY INSTALLATION")
2. Attach the supplied hand strap and belt clip through the fixture on the body (as shown in the drawings.)
3. Attach the flexible rubber antenna or connect an external antenna.

## ATTACHMENT OF HAND STRAP AND BELT CLIP



## EXTERNAL ANTENNA

1. Select a high performance antenna and set it up in the highest possible position.
2. Use a 50 ohm antenna and coaxial cable.
3. On VHF, the power loss in the antenna cable is large, so use a cable with the lowest possible loss and make it as short as possible.
4. Use a BNC plug for connection to the unit.

## LICENSES REQUIRED

### 1. Ship Station License

Your craft, when equipped with VHF/FM equipment, has a radio station on board which, if used, must have a current license. It is unlawful to operate a Ship Station which is not licensed. Inquire through your dealer or appropriate government agency for an application for a Ship Radio-Telephone license. Your craft station will be issued a call sign.

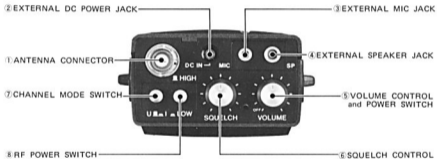
### 2. Operators License

A Restricted Radiotelephone Operator Permit is the license most often held by small vessel radio operators if a radio is not required for safety purposes. You can usually obtain this permit by mail without examination. Again, contact your marine dealer or appropriate government agency for information or application.

The Restricted Radiotelephone Operator Permit must be posted or kept on the person of the operator. Only a licensed radio operator may operate a radiotelephone transmitter. However, non-licensed individuals may talk over a radiotelephone if a licensed operator starts, supervises, ends the call, and makes necessary log entries.

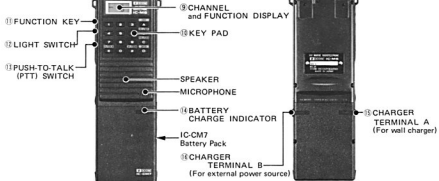
## SECTION V CONTROL FUNCTIONS

### TOP PANEL



FRONT PANEL

REAR PANEL



### 1. ANTENNA CONNECTOR

Connect the supplied flexible antenna. An external antenna can be used using a BNC connector.

### 2. EXTERNAL DC POWER JACK

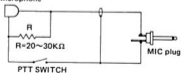
A voltage regulated DC power supply with an output of 5.5 volts ~ 13.8 volts can be connected here, instead of using the battery pack. Inserting the power plug into this jack, disables the attached power pack. The IC-CM7 will recharge automatically from power applied here.

### 3. EXTERNAL MIC JACK

When an external microphone is used, connect it to this jack. See the schematic for the proper hookup. When the external microphone is connected the built-in microphone does not function. The optional speaker-microphone, IC-CM9 or headset HS-10 with HS-10SA VOX unit, or HS-10SB PTT switch box, can also be used.

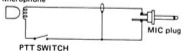
#### Electret condenser microphone

Microphone



#### Dynamic microphone

Microphone



#### 4. EXTERNAL SPEAKER JACK

When an external speaker (or an earphone) is used, connect it to this jack. Use a speaker with an impedance of 8 ohms. When the external speaker is connected the built-in speaker does not function.

#### 5. VOLUME CONTROL and POWER SWITCH

When this control is turned completely counterclockwise, the power is OFF. By turning the control clockwise beyond the "click", the unit is turned ON and the audio level increases by further rotating it clockwise.

#### 6. SQUELCH CONTROL

Sets the squelch threshold level. To turn OFF the squelch function, rotate this control completely counterclockwise. To set the threshold level higher, rotate the control clockwise.

#### 7. CHANNEL MODE SWITCH

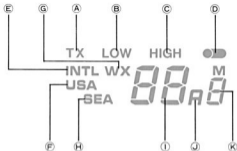
Switches the channels for the international or U.S.A. (or domestic) use.

#### 8. RF POWER SWITCH

Switches the output power of the set HIGH and LOW. In the HIGH (out) position, the output power is 5 watts at 13.2 volts. In the LOW (locked in) position, the output power is 1 watt at any voltage.

#### 9. CHANNEL and FUNCTION DISPLAY

Displays the operating channel and status of the radio.



- A. TRANSMIT INDICATOR: "TX" is displayed when the set is in the transmit mode.
- B. LOW POWER INDICATOR: "LOW" is displayed when the set is in the low output power (1W) mode.
- C. HIGH POWER INDICATOR: "HIGH" is displayed when the set is in the high output power (5W) mode.
- D. BATTERY CONDITION/SCAN INDICATOR: This mark is displayed just before the battery is exhausted. When the mark is displayed, stop to use the set and recharge the battery pack or replace the battery pack with a charged one. When the set is in a scan mode, this mark will be blinking.
- E. INTERNATIONAL MODE INDICATOR: "INTL" is displayed when the International mode is selected.

- F. U.S.A. MODE INDICATOR: "USA" is displayed when the U.S.A. mode is selected.
- G. WEATHER CHANNEL INDICATOR: "WX" is displayed when a weather channel is selected.
- H. SEA (DUAL WATCH) INDICATOR: "SEA" is displayed when the SEA (dual watch) function is turned ON.
- I. CHANNEL DISPLAY: Indicates the operating channel with 2 digits.
- J. U.S.A. CHANNEL INDICATOR: "A" is displayed when a U.S.A. mode channel is selected.
- K. MEMORY CHANNEL DISPLAY: When a memory channel is selected, the selected memory channel number and letter "M" are displayed here. When the operating channel is locked by the lock function, the letter "L" is displayed here instead of the memory channel number.

## 10. KEY PAD

This key pad has 16 keys consisting of ten numerical keys and six code keys. Some keys have dual functions.

The primary functions are available by just pushing each key. The ten numerical keys function to set a digit indicated on each key. The other keys function to set functions indicated above each key with letters on gray colored base.

The secondary functions are available by pushing each key while the "FUNC" key on the side is depressed. Each function is indicated above the key with letters on olive colored base.

11. FUNCTION KEY

By depressing this key, the secondary function of each key can be selected.

12. LIGHT SWITCH

While depressing this switch, the CHANNEL and FUNCTION DISPLAY is illuminated.

13. PUSH-TO-TALK (PTT) SWITCH

For transmission, press this switch and talk into the microphone with normal voice. The internal microphone is of the electret-condenser type and provides good pickup for all voice levels.

14. BATTERY CHARGE INDICATOR

Lights during battery charging.

15. CHARGER TERMINAL A

Connects the output plug of the supplied wall charger CM-16U/E or other suitable power source.

16. CHARGER TERMINAL B

Connects an output plug of an external 13.8V DC power source.

## SECTION VI OPERATION

### KEY FUNCTION

Some keys have dual functions. To set the secondary function, depress the "FUNC" key located on the side, until the key input for desired function has been completed.

| KEY | PRIMARY FUNCTION |  | SECONDARY FUNCTION |   |
|-----|------------------|--|--------------------|---|
|     | SYMBOL           | FUNCTION   | SYMBOL             | FUNCTION  |
| 1   | 1                | Sets the digit of 1.   | .....              | .....   |
| 2   | 2                | Sets the digit of 2.   | .....              | .....   |
| 3   | 3                | Sets the digit of 3.   | .....              | .....   |
| 4   | 4                | Sets the digit of 4.   | .....              | .....   |
| 5   | 5                | Sets the digit of 5.   | .....              | .....   |
| 6   | 6                | Sets the digit of 6.   | .....              | .....   |
| 7   | 7                | Sets the digit of 7.   | .....              | .....   |
| 8   | 8                | Sets the digit of 8.   | .....              | .....   |
| 9   | 9                | Sets the digit of 9.   | .....              | .....   |
| 0   | 0                | Sets the digit of 0.   | .....              | .....   |
| *   | DN               | Decreases the operating channel number or operating memory channel number. | SEA. W             | Sets the SEA (dual watch) function. To turn off this function, push the "A", "B" or "C" key without depressing the "FUNC" key, or "FUNC" key. |

| KEY | PRIMARY FUNCTION |  | SECONDARY FUNCTION |  |
|-----|------------------|--|--------------------|--|
|     | SYMBOL           | FUNCTION   | SYMBOL             | FUNCTION   |
| #   | UP               | Increases the operating channel number, or operating memory channel number.  | SCAN               | Starts the all channel Scan when the radio is in the DIAL mode, or the memory channel scan when the radio is in the memory channel mode. To stop the scan, push "A", "B" or "C" key. |
| A   | CH16             | Sets the radio to Channel 16.  | .....              | .....  |
| B   | WX               | Sets the radio in the weather channel mode.<br>Push the key, then a desired channel number "0" ~ "9".  | MR                 | Sets the radio in the memory channel mode.<br>Push the key, then a desired channel number "0" ~ "9" key without depressing the "FUNC" key.   |
| C   | DIAL             | Sets the radio in the dial mode. To set an operation channel, push this key, then desired number keys and "ENTER" key.                                   | LOCK               | Cancels any key pushing to prevent accidental key pushing.<br>To clear this function, push this key again while depressing the "FUNC" key.   |
| D   | ENTER            | Sets an operation channel, or writes an operation channel into a memory channel.<br>Push this key, after a desired channel number keys have been pushed. | .....              | .....  |

**CAUTION:** Be sure to release the radio from the dial lock function prior to turning off. If the radio is turned off while in the dial lock mode, it is necessary to push the function button and dial lock button after turning back on to release from dial lock and resume normal operation.

## CHANNEL SELECTION

### Channel 16 SETTING

By pushing the "A" (CH16) key, Channel 16 is selected instantly, regardless of the operating condition of the radio (except when the lock function is activated).

### FOR EXAMPLE



### DIAL MODE

When the radio is in the DIAL mode, the following channels can be selected:

Channels 01 - 28

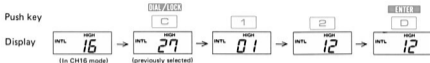
Channels 60 - 74

Channels 77 - 88

To set a desired channel, first of all, push the "C" (DIAL) key, set the channel mode switch to the mode including the desired channel, then enter the channel number into the display by pushing the appropriate numbers on the keyboard. Then push the "D" (ENTER) key if the displayed number is correct.

#### FOR EXAMPLE

When setting the operation channel to Channel 12:



The channel numbers other than above are invalid and cannot be accepted. In this case, by pushing the ENTER key, the entered number is canceled and the display will retain the previous channel number.

If the appropriated channel number has been selected but the ENTER key is not pushed within three seconds, the display will blink several times, then the previous channel number will continue to be displayed and retained.

#### FOR EXAMPLE



**WEATHER CHANNEL MODE** (Some versions are not provided.)

When the radio is in the **WEATHER CHANNEL** mode, the following weather channels can be selected:

|                      |   |            |
|----------------------|---|------------|
| Weather Channel (WX) | 1 | 162.550MHz |
| Weather Channel (WX) | 2 | 162.400MHz |
| Weather Channel (WX) | 3 | 161.650MHz |
| Weather Channel (WX) | 4 | 162.475MHz |
| Weather Channel (WX) | 5 | 162.425MHz |
| Weather Channel (WX) | 6 | 162.500MHz |
| Weather Channel (WX) | 7 | 162.525MHz |
| Weather Channel (WX) | 8 | 162.450MHz |
| Weather Channel (WX) | 9 | 161.775MHz |
| Weather Channel (WX) | 0 | 163.275MHz |

(These Channels are receive only.)

To set a desired weather channel, push the "B" (WX/MR) key, then enter the weather channel number, and the letters "WX" and channel number are displayed on the **CHANNEL** and **FUNCTION DISPLAY**. After this, to set a desired weather channel, simply push the number key of the desired one.

Pushing the "\*" (DN) key one time decreases the channel number by one increment. However, pressing the DN key continuously decreases the channel number continuously until the DN key is released.

FOR EXAMPLE



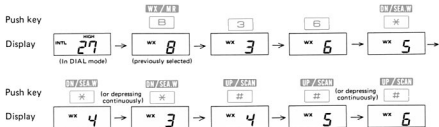
In the like manner, pushing the "#" (UP) key increases the channel number.

FOR EXAMPLE



## FOR EXAMPLE:

When setting the operating channel to Weather Channel 3, then changing it to other channel:



## MEMORY CHANNEL MODE

### MEMORY READ:

To recall an operation channel memorized in a memory channel, while depressing the "FUNC" key, push the "B" (WX/MR) key, and a memory channel number and an operation channel which have been set previously, will be displayed on the CHANNEL and FUNCTION DISPLAY, then push a digit key of the same number as the memory channel which has memorized the desired operation channel.

If no operation channel is memorized in the memory channel, “- -” will be displayed, and channel 16 will be displayed with release of the “FUNC” key.

FOR EXAMPLE:

When recalling the channel memorized in the memory channel 7;



FOR EXAMPLE:

When the recalled channel has not memorized any operation channel;



## MEMORY WRITE

Any operation channels (except weather channels) can be memorized into memory channels.

When no operation channels have been memorized in any memory channels, while depressing the "FUNC" key, push the "B" (WX/MR) key (a memory channel number and "--" are displayed), an operation channel number and the "D" (ENTER) key, then release the "FUNC" key. The operation channel number is memorized in the displayed memory channel.

After this, or when at least one memory channel has been memorized or when rewriting a memorized operation channel, select a desired memory channel to be memorized a desired operation channel, push the "B" (WX/MR) key while depressing the "FUNC" key, then enter the desired operation channel number into the display by pushing the appropriate numbers on the keyboard. Then push the "D" (ENTER) key if the displayed number is correct. If the "D" (ENTER) key is not pushed within three seconds, the entered number will be blinked then previous channel number (or "--") will be displayed.

### FOR EXAMPLE:

When memorizing Channel 12 into Memory Channel 2:





## SCANNING OPERATION

The SCAN can be used in the DIAL mode, WEATHER CHANNEL mode and the MEMORY CHANNEL mode.

In the DIAL mode, the radio scans all channel in the allocation selected by the CHANNEL ALLOCATION SWITCH.

In the WEATHER CHANNEL mode, the radio scans all 10 weather channels.

In the MEMORY CHANNEL mode, the radio scans only the memory channels which are memorized an operation channel respectively.

To set in the SCAN mode, push the “#” (UP/SCAN) key while pressing the “FUNC” key (the squelch should be engaged at this time), and the SCAN is activated.

When a signal is received on a channel, the squelch is opened and the SCAN stops on the channel. At this time, the BATTERY CONDITION/SCAN INDICATOR will be blinked to show the radio is in the SCAN mode. The SCAN will resume after the signal goes away.

To resume the SCAN when the scan stops on a signal, push the “#” (UP/SCAN) key while depressing the “FUNC” key, and the displayed channel changes to the upper channel. If the upper channel is no signal the scan will resume.

If the radio is turned to transmit mode during the scan function, the transmit frequency will be the frequency of the displayed channel at the moment. At this time, the scan function is cleared and the channel is locked.

To clear the scan function, just push the “FUNC” key, and the scan stops on the displayed channel. When the “A” (CH16) key is pushed, the scan will stop and the operating channel will go to channel 16. In the like manner, when the “B” (WX/MR) or “C” (DIAL/LOCK) key is pushed, the scan will stop and the operating channel will go to a channel in the respective mode.

When the radio is in the scan mode, all key functions, except the “A” (CH16), “B” (WX/MR) and “C” (DIAL/LOCK) key functions, are disabled.

#### SEA (DUAL WATCH) OPERATION

This function allows a check of channel 16 while operating on another channel. If a signal appears on channel 16, the radio watches it until the signal has disappeared, then the radio return to operate on the other channel.

The following steps are taken to utilize the SEA (DUAL WATCH) function.

1. Select channel 16 by pushing the “A” (CH16) key, then engage the squelch.

2. Select the desired channel by pushing the "B" (WX) or "C" (DIAL) key, or the "B" (MR) while depressing the "FUNC" key, depending on the desired channel, and entering the desired channel number.
3. Push the "\*" (DN/SEA, W) key while depressing the "FUNC" key, and the radio operates on the selected channel for two or three seconds and on channel 16 for a moment (about 0.1 second) alternately.
4. If a signal appears (the squelch will be opened by the signal) on channel 16, the radio receives on channel 16 until the signal has disappeared, then the radio will continue the SEA OPERATION.
5. The radio can transmit on the selected channel (except weather channels), even if the SEA OPERATION is functioning and the radio is receiving on channel 16. When the radio returns in the receive mode, the radio will continue the SEA OPERATION.

If wishing to transmit on channel 16, push the "A" (CH16) key, and the SEA OPERATION is disengaged and the radio operates on channel 16. To clear the SEA OPERATION, push the "FUNC" key, or the "C" (DIAL) or "B" (WX) key depending on the selected channel, and the radio operates on the selected channel.

## LOCK FUNCTION

This function provides to prevent a mis-operation by an accidental key pushing.

By pushing the "C" (DIAL/LOCK) key while depressing the "FUNC" key, the displayed channel (and other data, if any) is fixed, and the letter "L" is displayed at the memory channel number position to show the LOCK FUNCTION is actuated. At this time, all the key functions are disabled.

To clear the LOCK function, push the "C" (DIAL/LOCK) key again while depressing the "FUNC" key.

**CAUTION:** Be sure to release the radio from the dial lock function prior to turning off. If the radio is turned off while in the dial lock mode, it is necessary to push the function button and dial lock button after turning back on to release from dial lock and resume normal operation.

## RECEIVING

Make sure the **VOLUME CONTROL** and **POWER SWITCH** is in the **OFF** position, and before turning the power **ON**, confirm as follows:

1. Make sure the power pack is properly charged and attached to the set.
2. Make sure the supplied flexible antenna is properly set.

When an external antenna is employed, make sure the coaxial line is of the correct impedance (50 ohms) and is neither shorted nor opened, and is firmly connected to the antenna connector.

Set the controls and switches as follows:

- |   |  |
|---|--|
| ⑤ <b>VOLUME CONTROL</b> and <b>POWER SWITCH</b> | Completely counterclockwise ( <b>OFF</b> position) |
| ⑥ <b>SQUELCH CONTROL</b>                        | Completely counterclockwise                        |
| ⑦ <b>CHANNEL MODE SWITCH</b>                    | Desired mode, <b>I</b> or <b>U</b>                 |

Turn the **VOLUME CONTROL** and **POWER SWITCH** clockwise to click on. A channel will be displayed on the **CHANNEL** and **FUNCTION DISPLAY**. Slowly turn the **VOLUME CONTROL** clockwise to a comfortable level. Set the desired channel by pushing keys.

If no signal can be heard but only noise, turn the **SQUELCH CONTROL** clockwise until the noise from the speaker stops and set it just below this threshold. (When adjusting the squelch control

setting, if some communication signals can be heard, change the operating channel where only noise can be heard.) The radio will now remain silent until an incoming signal is received which opens the squelch. If the squelch is unstable due to the reception of weak signals, adjust the squelch control further until the proper threshold is obtained.


For channel setting, memory channel operation and scan operation refer to the above chapters.

## TRANSMITTING

Set the RF POWER SWITCH to your desired power HIGH (5 watts) or LOW (1 watt). If the lower output power (1 watt) is sufficient, push the RF POWER SWITCH in.

Select an empty channel that can be used for the type of communication you wish. Be sure the channel is open (not used).

Then set the operation channel to channel 16 by pushing the "A" (CH16) key, and after confirming that it is open, call the party you wish to contact, at this time, the letters "TX" is displayed at upper left corner of the CHANNEL and FUNCTION DISPLAY. When contact is made, go to the channel you checked before.

Hold the radio fairly close to your mouth. Depress the  PTT switch and speak in a clear, natural voice. When you have finished your part of the conversation, release the PTT switch, and the radio will return to receive mode.

When your conversation is completely finished, push the "A" (CH16) key to set channel 16.

## SECTION VII OPERATING RULES AND GUIDELINES

### *Prevent Interference*

Before transmitting, monitor the channel you wish to use to avoid interrupting transmissions in progress.

### *Call Procedures*

Calls must be properly identified and time limits must be respected.

1. Give your call sign each time you place a call to another vessel or a coast station. (If a call sign has not been assigned, identify the station by announcing the vessel name and the name of the licensee.)
2. Give your call sign at the end of each transmission of more than 3 minutes duration.
3. You must break and give your call sign at least once every fifteen minutes during long ship to shore calls.
4. Keep your unanswered calls short (less than thirty seconds) and do not repeat a call for two minutes.
5. Unnecessary Transmissions are not allowed.

### *Priorities*

Read all the rules and regulations pertaining to priorities and keep an up-to-date copy handy. Safety and Distress take priority over all others.

You must monitor and be able to transmit on 156.8MHz, Channel 16.

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.

#### Logs

Use of this equipment required entry of the watch period of 156.8MHz (CH16) by the operator with vessel name, call sign and operator signature. All distress, emergency, and safety messages must be recorded in complete detail. Log date activity is usually recorded in 24 hour time. Universal Time (formerly GMT) is frequently used.

Adjustment, repairs, channel frequency changes and authorized modifications affecting electrical operation of the equipment must be kept in the equipment log and entries signed by the authorized licensed technician performing or supervising the work. This is done in the equipment log, a small section is included in the back of this manual. Contacts are recorded in a communication log. A sample of what would be on the page is shown below.

| DATE/TIME | CHANNEL | VESSEL | REMARKS | OPERATOR |
|-----------|---------|--------|---------|----------|
|           |         |        |         |          |
|           |         |        |         |          |
|           |         |        |         |          |

### Channel usage

A channel selection system, frequency-usage, has been internationally adapted for the marine VHF band. Each frequency within the spectrum has been assigned a channel number, for example, 156.300 MHz is Channel 6. Specific purposes have been assigned to each channel under this system i.e. inter-ship between two vessels and ship-to-shore. Geographical locations have specific channels assigned for use with the land telephone system.

Your selection of channels to be installed should be based on the type of contacts you plan to make within the areas you live or travel to. The chart on the following pages will aid this selection.

Each geographical area has specific channels assigned to it for use with the land telephone system.

Study the chart on the following pages, showing the available channels and their usage.

### Dead Spots

Topography may prevent reception and/or transmission from some locations. Move to another location if you find a "dead spot".

### Routine Maintenance







Your ICOM transceiver is designed to provide high quality performance for many years if cared for in a proper manner. Each year you should have the following checked by a licensed technician to verify your unit's performance.

1. Check antenna system.
2. Verify transmitter frequency, deviation, and power output.

**CAUTION:** Every effort is made to make the IC-M5 as water resistant as feasible. However, it is not fully waterproof and if left laying in a horizontal position, face up for an extended period of time in rain or direct water spray natural seepage may occur into the electronic section of the radio.

We strongly recommend that if the radio is exposed to extended periods of rain or spray, it be in a vertical position or face down to provide the best protection for the radio.

## POWER PACK SPECIFICATIONS

|                     | IC-CM2  | IC-CM3  | IC-CM4                       | IC-CM4  | IC-CM5   | IC-CM7  | IC-CM8  |
|---------------------|---|---|------------------------------|---|--|---|---|
| Cells<br>[Capacity] | N-425A R<br>(X 6)<br>[400mAH]   | N-250A A<br>(X 7)<br>[350mAH]   | AA Size<br>Alkaline<br>(X 6) | AA Size<br>Nickel-Cadmium<br>(X 6)  | N-425A R<br>(X 9)<br>[400mAH]  | N-450AR x 11<br>(450mAH)  | N-800AR x 7<br>(800mAH)   |
| Voltage             | 7.2V  | 8.4V  | 9.0                          | 7.2V  | 10.8V  | 13.2V   | 8.4V  |
| RF Output           | 1.5W  | 2.5W  | 2.5W                         | 1.5W  | 4.0W   | 5.0W  | 2.5W  |
| Charging            | Rapid   | Normal  |                              | Normal  | Rapid  | Rapid   | Rapid   |
| Charging Time       | 1 ~ 1.5H  | 1.5H  |                              | 1.5H  | 1 ~ 1.5H   | 1 ~ 1.5H<br>(600mA)<br>[CM-35]<br>1.5H<br>(90mA)<br>[CM-16U/E]                      | 2 ~ 3H<br>(600mA)<br>[CM-30/35]<br>1.5H<br>(80mA)<br>[CM-16U/E]                     |
| Suitable Charger    | CM-30/35  | CM-30/35<br>CM-16U/E<br>IC-CM1  |                              | CM-30/35  | CM-30/35   |   |   |
| Charging Current    | 600mA   | 25mA  |                              | 45mA  | 600mA  |   |   |
| Ambient Temp        | +10°C ~ +40°C   | 0°C ~ +45°C   |                              | 0°C ~ +45°C   | +10°C ~ +40°C  | +10°C ~ +40°C   | +10°C ~ +40°C   |
| Overcharge Protect  | ○   | X   |                              | X   | ○  | ○   | ○   |
| Current Selector    |  |  |                              |  |  |  |  |
| Height              | 39m/m   | 39m/m   | 49m/m                        | 49m/m   | 60m/m  | 80m/m   | 80m/m   |
| Battery Replace     | X   | X   | ○                            | ○   | X  | X   | X   |

## SECTION VIII MARINE VHF RADIOTELEPHONE CHANNEL FREQUENCIES

| Channel | Ship Transmit | Ship Receive | Mode S/D | Only Intl | Only Com | USCG | Function    |               | Type of Operation                     |
|---------|---------------|--------------|----------|-----------|----------|------|-------------|---------------|---------------------------------------|
|         |               |              |          |           |          |      | Ship - Ship | Ship to Shore |                                       |
| 1       | 156.050       | 160.650      | D        | yes       |          |      | no          | yes           | Public Correspondence, Port Operation |
| 2       | 156.100       | 160.700      | D        | yes       |          |      | no          | yes           | Public Correspondence, Port Operation |
| 3       | 156.150       | 160.750      | D        | yes       |          |      | no          | yes           | Public Correspondence, Port Operation |
| 4       | 156.200       | 160.800      | D        | yes       |          |      | no          | yes           | Public Correspondence, Port Operation |
| 5       | 156.250       | 160.850      | D        | yes       |          |      | no          | yes           | Public Correspondence, Port Operation |
| 6       | 156.300       | 156.300      | S        |           |          |      | yes         | no            | Safety                                |
| 7       | 156.350       | 160.950      | D        |           | yes      |      | no          | yes           | Public Correspondence, Port Operation |
| 7A      | 156.350       | 156.350      | S        |           | yes      |      | yes         | yes           | Port Operation                        |
| 8       | 156.400       | 156.400      | S        |           | yes      |      | yes         | no            | Inter-ship                            |
| 9       | 156.450       | 156.450      | S        |           |          |      | yes         | yes           | Port Operation                        |
| 10      | 156.500       | 156.500      | S        |           | yes      |      | yes         | yes           | Port Operation                        |
| 11      | 156.550       | 156.550      | S        |           | yes      |      | yes         | yes           | Port Operation                        |
| 12      | 156.600       | 156.600      | S        |           |          |      | yes         | yes           | Port Operation                        |
| 13      | 156.650       | 156.650      | S        |           |          |      | yes         | yes           | Bridge to Bridge, (1W) Navigational   |
| 14      | 156.700       | 156.700      | S        |           |          |      | yes         | yes           | Port Operation                        |
| 15      |               | 156.750      | S        |           |          |      | Rcv         | Rcv           | Recv Only - Coast to Ship             |
| 16      | 156.800       | 156.800      | S        |           |          |      | yes         | yes           | Calling & Safety                      |
| 17      | 156.850       | 156.850      | S        |           |          |      | no          | yes           | State Controlled - Ship to Coast (1W) |
| 18      | 156.900       | 161.500      | D        | yes       |          |      | no          | yes           | Port Operation                        |
| 18A     | 156.900       | 156.900      | S        |           | yes      |      | yes         | yes           | Port Operation                        |
| 19      | 156.950       | 161.550      | D        | yes       |          |      | no          | yes           | Port Operation                        |
| 19A     | 156.950       | 156.950      | S        |           | yes      |      | yes         | yes           | Port Operation                        |
| 20      | 157.000       | 161.600      | D        |           |          |      | no          | yes           | Port Operation                        |
| 21      | 157.050       | 161.650      | D        | yes       |          |      | no          | yes           | Port Operation                        |
| 21A     | 157.050       | 157.050      | S        |           |          | yes  | yes         | yes           | Port Operation (USCG)                 |
| 22      | 157.100       | 161.700      | D        | yes       |          |      | no          | yes           | Port Operation                        |
| 22A     | 157.100       | 157.100      | S        |           |          | yes  | yes         | yes           | Port Operation (USCG)                 |
| 23      | 157.150       | 161.750      | D        | yes       |          |      | no          | yes           | Public Correspondence                 |
| 23A     | 157.150       | 157.150      | S        |           |          | yes  | yes         | yes           | Port Operation (USCG)                 |
| 24      | 157.200       | 161.800      | D        |           |          |      | no          | yes           | Public Correspondence                 |
| 25      | 157.250       | 161.850      | D        |           |          |      | no          | yes           | Public Correspondence                 |
| 26      | 157.300       | 161.900      | D        |           |          |      | no          | yes           | Public Correspondence                 |
| 27      | 157.350       | 161.950      | D        |           |          |      | no          | yes           | Public Correspondence                 |
| 28      | 157.400       | 162.000      | D        |           |          |      | no          | yes           | Public Correspondence                 |

| Channel  | Ship Transmit | Ship Receive | Mode S/D | Only Int'l | Only Com. | USCG | Function    |               | Type of Operation                     |
|----------|---------------|--------------|----------|------------|-----------|------|-------------|---------------|---------------------------------------|
|          |               |              |          |            |           |      | Ship - Ship | Ship to Shore |                                       |
| 60       | 156.025       | 160.625      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 61       | 156.075       | 160.675      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 62       | 156.125       | 160.725      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 63       | 156.175       | 160.775      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 64       | 156.225       | 160.825      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 65       | 156.275       | 160.875      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 65A      | 156.275       | 156.275      | S        |            |           |      | yes         | yes           | Port Operation                        |
| 66       | 156.325       | 160.925      | D        | yes        |           |      | no          | yes           | Public Correspondence, Port Operation |
| 66A      | 156.325       | 156.325      | S        |            |           |      | yes         | yes           | Port Operation                        |
| 67       | 156.375       | 156.375      | S        |            | yes       |      | yes         | no            | Port Operation                        |
| 68       | 156.425       | 156.425      | S        |            |           |      | yes         | yes           | Port Operation                        |
| 69       | 156.475       | 156.475      | S        |            |           |      | no          | yes           | Port Operation                        |
| 70       | 156.525       | 156.525      | S        |            |           |      | yes         | no            | InterShip                             |
| 71       | 156.575       | 156.575      | S        |            |           |      | no          | yes           | InterShip, Port Operation             |
| 72       | 156.625       | 156.625      | S        |            |           |      | yes         | no            | InterShip                             |
| 73       | 156.675       | 156.675      | S        |            |           |      | yes         | yes           | Port Operation                        |
| 74       | 156.725       | 156.725      | S        |            |           |      | yes         | yes           | Port Operation                        |
| 77       | 156.875       | 156.875      | S        |            | yes       |      | yes         | no            | InterShip                             |
| 78       | 156.925       | 161.525      | D        | yes        |           |      | no          | yes           | Port Operation                        |
| 78A      | 156.925       | 156.925      | S        |            |           |      | no          | yes           | Port Operation                        |
| 79       | 156.975       | 161.575      | D        | yes        |           |      | no          | yes           | Port Operation                        |
| 79A      | 156.975       | 156.975      | S        |            | yes       |      | yes         | yes           | Port Operation                        |
| 80       | 157.025       | 161.625      | D        | yes        |           |      | no          | yes           | Port Operation                        |
| 80A      | 157.025       | 157.025      | S        |            | yes       |      | yes         | yes           | Port Operation                        |
| 81       | 157.075       | 161.675      | D        | yes        |           |      | no          | yes           | Port Operation                        |
| 81A      | 157.075       | 157.075      | S        |            |           | yes  | yes         | yes           | Port Operation (USCG)                 |
| 82       | 157.125       | 161.725      | D        | yes        |           |      | no          | yes           | Port Operation, Public Correspondence |
| 82A      | 157.125       | 157.125      | S        |            |           | yes  | yes         | yes           | Port Operation (USCG)                 |
| 83       | 157.175       | 161.775      | D        | yes        |           |      | no          | yes           | Public Correspondence                 |
| 83A      | 157.175       | 157.175      | S        |            |           | yes  | yes         | yes           | InterShip, Port Operation (USCG)      |
| 84       | 157.225       | 161.825      | D        |            |           |      | no          | yes           | Port Operation, Public Correspondence |
| 85       | 157.275       | 161.875      | D        |            |           |      | no          | yes           | Public Correspondence                 |
| 86       | 157.325       | 161.925      | D        |            |           |      | no          | yes           | Public Correspondence                 |
| 87       | 157.375       | 161.975      | D        |            |           |      | no          | yes           | Public Correspondence                 |
| 88       | 157.425       | 162.025      | D        | yes        |           |      | no          | yes           | Public Correspondence                 |
| 88A      | 157.425       | 157.425      | S        |            | yes       |      | yes         | no            | InterShip                             |
| WX1      |               | 162.550      |          |            |           |      | Rcv         | Rcv           | NOAA Weather (Rcv Only)               |
| WX2      |               | 162.400      |          |            |           |      | Rcv         | Rcv           | NOAA Weather (Rcv Only)               |
| WX3      |               | 161.650      |          |            |           |      | Rcv         | Rcv           | NOAA Weather (Rcv Only)               |
| WX4(21R) |               | 162.475      |          |            |           |      | Rcv         | Rcv           | Canada Weather (Rcv Only)             |

TRANSMITTER LOG

| Radio Set Serial No.   | Date<br>(Initial<br>Reading) | Date | Date | Date | Date | Date | Date |
|--|------------------------------|------|------|------|------|------|------|
| Transmitter RF Power Output  |                              |      |      |      |      |      |      |
| Transmitter Deviation  |                              |      |      |      |      |      |      |
| Transmitter Frequency CH16   |                              |      |      |      |      |      |      |
| Transmitter Frequency CH6  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
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|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
|  |                              |      |      |      |      |      |      |
| <b>TECHNICIAN SIGNATURE,<br/>ADDRESS, FCC LICENSE NO.,<br/>EXPIRATION DATE</b> |                              |      |      |      |      |      |      |



## EMERGENCY USE

If your vessel requires assistance, attract the attention of other vessels and the Coast Guard by sending a distress message on Channel 16.

Procedures for sending a distress signal.

1. MAYDAY, MAYDAY, MAYDAY (repeat three times).
2. THIS IS (name of the vessel).
3. LOCATED AT (gives position).
4. Give the reason for the distress call.
5. Explain what assistance you need.
6. Give additional information to help those come to your assistance, (vessel length, color, type, etc.)
7. Use Channel 16 only to make initial contact.
8. After making initial contact agree on an alternate frequency, such as Channel 22A or Channel 6 and clear Channel 16 for other traffic.

## SECTION XI OPTIONS

**DESK BATTERY MULTI-CHARGER  
CM-60**



**DESK BATTERY CHARGER  
CM-35**



**SPEAKER-MICROPHONE  
IC-CM9**



**BATTERY PACK  
CM-12**

- Output voltage:  
15V
- Battery size:  
AA, R6, SUM-3 or  
UM-3
- The CM-12 takes  
10 dry batteries.





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