IMPORTANT

READ THIS INSTRUCTION MANUAL CAREFULLY before attempting to operate the transceiver.

SAVE THIS INSTRUCTION MANUAL—This manual contains important safety and operating instructions for the IC-M710RT MF/HF MARINE TRANSCEIVER.

EXPLICIT DEFINITIONS

The explicit definitions described below apply to this instruction manual.

<table>
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<th>WORD</th>
<th>DEFINITION</th>
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<tr>
<td>WARNING</td>
<td>Personal injury, fire hazard or electric shock may occur.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Equipment damage may occur.</td>
</tr>
<tr>
<td>NOTE</td>
<td>If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.</td>
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</table>

NOTE: The IC-M710RTGMDSS version has a high-stability crystal oscillator unit. This unit draws a slight current even when power to the transceiver is OFF. To prevent battery exhaustion when docking your vessel for extended periods, unplug the DC cable from the DC power receptacle.

PRECAUTIONS

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

⚠️ WARNING! NEVER mount the transceiver overhead. The weight of the transceiver is approximately 8 kg., but its apparent weight will increase several fold due to wave shocks and vibration. The transceiver must be mounted on a flat hard surface only.

NEVER connect a power source of more than 16 V DC such as a 24 volt battery. This connection will ruin the transceiver.

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

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

NEVER expose the transceiver to rain, snow or any liquids.

There are two types of grounding systems available for the IC-M710RT—Negative Ground and Floating Ground—NEVER install the negative ground type to a plus-grounding ship. Such a connection might blow fuses and is not usable.

DO NOT use chemical agents such as benzene or alcohol when cleaning, as they can damage the transceiver’s surfaces.

In maritime mobile operation, KEEP the transceiver and microphone as far away as possible (at least 1 m) from the magnetic navigation compass to prevent erroneous indications.

USE an Icom microphone and/or handset only (supplied or optional). Other brands may have different pin assignments and may damage the transceiver.

AVOID using or placing the transceiver in areas with temperatures below –20°C (–4°F) or above +60°C (+140°F).

AVOID connecting the transceiver to a power source using reverse polarity. This connection will not only blow fuses but may also damage the transceiver.

AVOID placing the transceiver in excessively dusty environments or in direct sunlight.

AVOID placing the transceiver against walls or putting anything on top of the transceiver. This will obstruct heat dissipation.
IN CASE OF EMERGENCY (for maritime operation)

If your vessel requires assistance, contact other vessels and the Coast Guard by sending a distress call on 2182 kHz.

Or, transmit your distress call using digital selective calling on 2187.5 kHz.

iosity

Using 2182 kHz with voice

1. Push [2182kHz] to select the emergency frequency.
2. Push [ALARM] and [TX FREQ] for 1 sec. to transmit a 2-tone alarm signal for at least 30 sec.
   - The transceiver automatically stops the alarm after 50 sec.
3. Push [ALARM] to turn the alarm transmission off, then push and hold the PTT switch on the microphone and send the following information:
   1. “MAYDAY, MAYDAY, MAYDAY.”
   2. “THIS IS . . . . . . . . . . . ” (name of vessel)
   3. “LOCATED AT . . . . . . . ” (vessel’s position)
   4. Give the reason for the distress call.
   5. Explain what assistance you need.
   6. Give additional information:
      • Vessel type
      • Vessel length
      • Vessel color
      • Number of people onboard.

Using digital selective calling

(Only for GMDSS versions with an optional GM-110DSC DSC TERMINAL UNIT)

When immediate help is needed

1. Push and hold [EMERGENCY] on the GM-110DSC for 5 sec., until the short beeps become one long beep, to send the distress call.
2. After 2182 kHz is automatically selected, transmit the appropriate information as at left using voice.

When a potential problem exists

1. Push [SEL] on the GM-110DSC, then select “all ships call” with [ENT] and the DATA SELECTOR.
2. Push and hold [CALL] on the GM-110DSC for 5 sec., until short beeps become one long beep, to use the “all ships call” function.
3. After the pre-selected frequency is selected, transmit the appropriate information using voice.
   - DSC equipped ships may monitor your transmission.

VERSIONS

The following versions are available for the IC-M710RT:

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<td>Negative ground and Floating ground</td>
<td>Corrosion-resistant exterior. High stability crystal and FSK narrow filter built-in. Optional DSC terminal unit can be connected. 2182 kHz 2-tone alarm is built-in.</td>
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<tr>
<td>Marine</td>
<td>Negative ground and Floating ground</td>
<td>2182 kHz 2-tone alarm is built-in. FSK/CW narrow filter is optional. All SSB/FSK ITU channels available.</td>
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<td>General</td>
<td>Negative ground only</td>
<td>2182 kHz 2-tone alarm is optional. FSK/CW narrow filter is optional. ITU channels are optional.</td>
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Call Procedures
1. Give your call sign each time you call another vessel or coast station. If you have no call sign, identify your vessel name and the name of the licensee.
2. Give your call sign at the end of each transmission that lasts more than 3 min.
3. You must break and give your call sign at least once every 15 min. during long ship-to-shore calls.
4. Keep your unanswered calls short, less than 30 sec. Do not repeat a call for 2 min.
5. Unnecessary transmissions are not allowed.

Priorities
1. 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.
2. False or fraudulent distress calls are prohibited and punishable by law.

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

Logs
1. All distress, emergency and safety calls must be recorded in complete detail. Log data activity is usually recorded in 24 hour time. Universal Time (UTC) is frequently used.
2. Adjustments, repairs, channel frequency changes and authorized modifications affecting electrical operation of the equipment must be kept in the maintenance log; entries must be signed by the authorized licensed technician performing or supervising the work.

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 be 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, and ends the call, and makes the necessary log entries.

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

**Front panel (controller)**

1. **MICROPHONE CONNECTOR** (p. 20)
   
   Accepts the supplied microphone or an optional handset.

   **NOTE:** No audio is output via the speaker when the microphone or handset is not connected.

2. **POWER SWITCH [POWER]**
   
   Turns power on and off.

3. **SPEAKER SWITCH [SPEAKER]**
   
   Turns the built-in speaker on and off.

   - "•" appears in the display while the speaker is turned off.
   - Any external speaker connected to the rear panel is not turned off.

4. **DISPLAY INTENSITY SWITCH [DIMMER]**
   
   - Toggles the display backlight on and off.
   - While pushing, rotate [CHANNEL] to adjust the backlighting to one of 4 levels.
   - While pushing, rotate [GROUP] to adjust the display contrast to one of 10 levels.

5. **VOLUME CONTROL [VOLUME]**
   
   Adjusts the audio output level.
   - Audio does not come from the speaker when:
     - A microphone is not connected.
     - The [SQL] switch is turned on and no signal is being received.

6. **GROUP CHANNEL SELECTOR [GROUP]**
   
   Selects groups in 20 channel steps and ITU marine channel groups.

   **NOTE:** Some versions have no ITU channels.

7. **ANTENNA TUNE SWITCH [TUNE]** (p. 9)
   
   Tunes the connected tuner to the antenna.
   - Activates only when an optional antenna tuner such as Icom’s AT-130/E is connected.

   **NOTE:** When selecting “automatic tuning” in set mode, pushing this switch is not necessary to tune the antenna. (p. 13)

8. **CHANNEL SELECTOR [CHANNEL]** (p. 6)
   
   - Selects an operating channel within the selected channel group such as ITU channels.
   - User channels can be selected from 1 to 160 (max.) in sequence regardless of the channel group.
   - Changes the operating frequency* after [CE] is pushed (while “•” appears).
   - The changed frequency is not programmed in this way.

9. **FUNCTION SWITCH [FUNC]**
   
   After pushing, activates the secondary functions of these switches:
   - [RESET] . . . . Deactivates external control such as from a DSC terminal unit when connected.
   - [SQL] . . . . Starts and stops scan (p. 7).
   - [SPEAKER] . . . Activates intercom function (p. 17).
   - [RX] . . . . . . Sets RF gain (p. 10).
   - [TX] . . . . Selects transmit power (p. 9).
   - [CE] . . . . Reprograms the channel name (p. 12).

   **NOTE:** Function availability depends on version.

10. **CLARITY CONTROL [CLARITY]** (p. 10)
    
    Shifts the receive frequency ±150 Hz for clear reception of an off frequency signal.
**KEYPAD**
- **Enters the selected channel number (or frequency*) for direct channel selection. (p. 7)**
- **Stores a receive frequency into a user channel or ITU simplex channel when:**
  - pushing [CE] (‘s’ appears)
  - entering the desired frequency via the keypad
  - pushing and holding [RX] (p. 12)
- **Adjusts the RF gain after pushing [FUNC] to reduce the receiver sensitivity. (p. 10)**
- **Stores a transmit frequency into a user channel (except General versions) when:**
  - pushing [TX] (‘$’ flashes)
  - pushing [CE] (‘s’ appears)
  - entering the desired frequency via the keypad
  - pushing and holding [TX] (p. 12)
- **Selects the transmitter channel for cross channel operation (Europe versions only) when:**
  - pushing [TX] (‘$’ flashes)
  - entering the desired channel number via the keypad
- **Selects the transmit output power after pushing [FUNC]. (p. 9)**
- **Toggles the channel number input and frequency input.* (p. 8)**
- “s” appears when frequency input* is selected.
- The channel selector and keypad changes the frequency while “s” appears.
- **Clears the entered digit and retrieves the previous channel (or frequency*) while entering numbers. (p. 7)**
- **Enters the name programming condition, after pushing [FUNC], for changing the channel name. (p. 12)**
- **Toggles the channel and frequency indications. (p. 6)**
- **Enters “–” for ITU simplex channels. (p. 7)**
  - Enter channel number with up to 4 or 5 digits when “$” does not appear. (p. 7)
  - Enter the frequency with up to 6 digits* when “s” appears. (p. 8)

**SQUELCH SWITCH [SQL]** (p. 10)
- **Activates the voice squelch function to reject undesired background noise while no signal is being received.**
  - The squelch opens only when the received signal contains no voice or FSK components.
- **Starts and stops the scan function after pushing [FUNC]. (p. 7)**

**NOISE BLANKER SWITCH [NB]** (p. 10)
- **Turns the noise blanker function on to remove pulse-type noise such as engine ignition noise.**
  - “NB” appears when the function is turned on.

**AGC OFF SWITCH [AGC]** (p. 10)
- **Deactivates the AGC function to receive weak signals blocked by strong adjacent signals.**
  - “ê” appears when the [AGC] switch is turned on (stands for AGC deactivated).

**MODE SWITCH [MODE]** (p. 9)
- **Selects an operating mode temporarily. Available modes differ with version.**
  - J3E (USB), H3E, J2B (AFSK), FSK, R3E and A1A (CW) modes are available.
  - The temporary mode is cleared and the previous mode appears when changing a channel.

**OVEN INDICATOR** (GMDSS version only)
- Internal high-stability crystal oscillator unit contains a temperature-compensating oven heater. This high-stability crystal oscillator improves frequency stability.
  - “STANDBY” appears when power to the main unit is turned off.

**TRANSMIT FREQUENCY SWITCH [TX FREQ]**
- **Displays the transmit frequency and opens the squelch to check and monitor the transmit frequency.**

**2182 kHz SELECTION SWITCH [2182kHz • RESET]** (p. iii)
- **Selects channel 0 (2182 kHz; distress call frequency).**
  - The channel selector does not function when selecting channel 0.
  - Ignores external control and gives the front panel control priority when an external controller (NMEA format) is connected.

**ALARM SWITCH [ALARM]** (p. iii)
- **Emits a distress alarm signal from the speaker.**
- **Transmits a distress alarm or alarm testing signal when pushed together with the [TX FREQ] switch.**

**NOTE:** General versions are not equipped with this [ALARM] switch.

*Some versions do not have frequency selection and frequency indication.*
2 PANEL DESCRIPTION

Main unit (controller detached)

1 RS-232C CONNECTOR (p. 18)
Connects the IC-M710RT to a PC via an RS-232C cable for remote control of transceiver function using the optional RS-710RT software.

2 POWER INDICATOR
Appears while power is turned on.

3 CONTROLLER CONNECTOR
Connects the main body of the IC-M710RT to the front panel (controller) when detached from the main body.

4 CONTROLLER CONNECTOR (pgs. 16, 17)
Same as above.

5 POWER SWITCH
Same function as the power switch ([POWER]) on the front panel.
• Only available on the Europe and GMDSS versions.

♦ HM-120 microphone keys
The “P” key on the HM-120 HAND MICROPHONE can be set to function as the [MODE], [NB], [AGC], [SQL] or [TUNE] keys on the remote controller. (The ▲▼ keys function the same as the [CHANNEL] selector.) Also, using set mode (p. 15) these keys can be deactivated if desired.

While pushing [P] on the microphone and the switch on the remote controller whose function you want to assign (see above), turn power ON.
• Repeat this to assign a different key.
Panel Description

- **Display**

1. **ALARM INDICATOR** (p. iii)
   - Appears when the alarm function is activated such as for an alarm test or distress alarm transmission.
   - Not available in General version.

2. **RECREATE INDICATOR** (p. 10)
   - Appears while receiving and when the squelch is open.

3. **TUNE INDICATOR** (p. 9)
   - Flashes while the connected antenna tuner, such as Icom's AT-130, is being tuned.
   - Tuning starts when transmitting on a new frequency or pushing the [TUNE] switch.

4. **TRANSMIT INDICATOR**
   - Appears when transmitting. (p. 9)
   - Flashes when the [TX] key is pushed for transmit frequency programming. (p. 12)

5. **DSC INDICATOR** (p. iii)
   - Appears when an optional GM-110DSC DSC TERMINAL UNIT controls transceiver functions.
   - The GM-110DSC can be connected to GMDSS versions only.

6. **SQUELCH INDICATOR** (p. 10)
   - Appears when the squelch is on.

7. **SCAN INDICATOR** (p. 7)
   - Appears when the scan function is in use.
   - The scan function is not available on some versions.
   - Pushing [FUNC] then [SQL] starts and stops scan.

8. **FUNCTION INDICATOR**
   - Appears when the [FUNC] switch is pushed.

9. **NOISE BLANKER INDICATOR** (p. 10)
   - Appears when the [NB] switch is turned on.

10. **AGC OFF INDICATOR** (p. 10)
    - Appears when the [AGC] switch is pushed to indicate the AGC function is deactivated.

11. **MODE READOUT**
    - Shows the selected operating mode (type of emission).

12. **SPEAKER OFF INDICATOR**
    - Appears when the [SPEAKER] switch is pushed to indicate the front panel speaker is deactivated.

13. **CHANNEL READOUT**
    - Shows the selected channel number during channel indication. (p. 6)
    - Shows the receive frequency during frequency indication. (p. 9)

14. **SIMPLEX/DUPLEX INDICATORS**
    - These appear to show whether the selected channel is simplex or duplex.

15. **FREQUENCY INDICATORS** (p. 8)
    - Appear when the frequency entry condition* is selected for frequency selection.
    - The [CE] key toggles the indicator ON and OFF.
    * Some versions have no frequency entry condition.
SELECTING A CHANNEL/FREQUENCY

Selecting a channel

The transceiver has 160 user channels and ITU channels. However, the number of user channels can be optionally restricted and ITU channels are not available with some versions.

NOTE: When channel 0 and/or 2182 kHz is selected with the [2182KHz] switch, channel selection is NOT possible. In such cases, push [2182KHz] in advance.

NOTE: Channel name (alphanumeric) may not appear during channel indication depending on set mode settings (p. 14).

Using the channel selector

The transceiver has two large controls for group selection and channel selection. The [GROUP] selector changes channels in 20 channel increments and selects ITU channel groups*; and the [CHANNEL] selector selects each channel.

1. Make sure no “s” indicator appears on the display.
2. Rotate the [GROUP] selector to select the desired channel group as shown at right and/or below.
3. Rotate the [CHANNEL] selector to select the desired channel.

[EXAMPLE]: Selection with the [GROUP] selector

1 J3E WWV
21 J3E KMI
41 J3E WOM
61 J3E WOO
121 J3E FAX
141 J3E SHP/SHP
401 J3E
4-1 J3E
4A LTD
601 J3E
6.501.0
2501 J3E
26.145.0
25-1 J3E
FAX
4001 FSK
4.210.5

*All ITU channels are not available with some versions and ITU FSK channels can be hidden using set mode. (p. 13)

CHANNEL GROUPS

<table>
<thead>
<tr>
<th>CHANNEL NO.</th>
<th>DESCRIPTION</th>
<th>CHANNEL NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 160</td>
<td>User channels*1</td>
<td>1601 to 1656</td>
<td>16 MHz ITU duplex channels</td>
</tr>
<tr>
<td>401 to 427</td>
<td>4 MHz ITU duplex channels</td>
<td>16-1 to 16-9</td>
<td>16 MHz ITU simplex channels</td>
</tr>
<tr>
<td>4-1 to 4-9</td>
<td>4 MHz ITU simplex channels</td>
<td>1801 to 1815</td>
<td>18 MHz ITU duplex channels</td>
</tr>
<tr>
<td>601 to 608</td>
<td>6 MHz ITU duplex channels</td>
<td>18-1 to 18-9</td>
<td>18 MHz ITU simplex channels</td>
</tr>
<tr>
<td>6-1 to 6-9</td>
<td>6 MHz ITU simplex channels</td>
<td>2201 to 2253</td>
<td>22 MHz ITU duplex channels</td>
</tr>
<tr>
<td>801 to 832</td>
<td>8 MHz ITU duplex channels</td>
<td>22-1 to 22-9</td>
<td>22 MHz ITU simplex channels</td>
</tr>
<tr>
<td>8-1 to 8-9</td>
<td>8 MHz ITU simplex channels</td>
<td>2501 to 2510</td>
<td>25 MHz ITU duplex channels</td>
</tr>
<tr>
<td>1201 to 1241</td>
<td>12 MHz ITU duplex channels</td>
<td>25-1 to 25-9</td>
<td>25 MHz ITU simplex channels</td>
</tr>
<tr>
<td>12-1 to 12-9</td>
<td>12 MHz ITU simplex channels</td>
<td>4001 to 25040</td>
<td>ITU FSK duplex channels*2</td>
</tr>
</tbody>
</table>

*1[GROUP] selector changes in 20 channels steps.
*2SITOR use—no group separation.
SELECTING A CHANNEL/FREQUENCY

Using the keypad
Direct channel selection via the keypad is available for quick channel selection.

1. Make sure “▶” does not appear on the display.
   • If it appears, push [CE] to delete it.
2. Enter the desired channel number via the keypad.
   • A user channel is selected when channel 1–160 is input (max. number may be optionally restricted).
   • An ITU SSB channel is selected when channel numbers higher than 401 are input (not available for some versions).
   • An ITU FSK channel is selected when channel numbers higher than 4001 are input (not usable according to set mode setting).
3. The “–” key can be used for selecting an ITU simplex channel.
4. Push [RX] to select the entered channel.

Using scan functions
(Some versions do not have these functions)
The transceiver has automatic channel or frequency change capability (scan function). There are 3 types of scan functions available to suit your needs.

Channel scan
- Scans the frequency range at the programmed scan frequency.
- Scans fast when squelch is closed and slowly when squelch is open.

Channel resume scan
- Scans the frequency range after transmitting.
- Scans for 30 sec., then resumes after transmitting.

Programmed scan (optional)
- Scans the frequency range between the programmed frequencies on channels 159 and 160.

Scan selection is available in set mode. See p. 14 for scan selection.

SCAN OPERATION
1. Select your desired channel group with the [GROUP] and [CHANNEL] selector.
2. Push [SQL] to turn OFF the squelch function if programmed scan is selected.
4. To stop the scan, repeat step 3 again.
   • [CHANNEL] rotation and some other switches also stop the scan.

[EXAMPLE]: Selecting channel 153
3 SELECTING A CHANNEL/FREQUENCY

■ Selecting a frequency

The transceiver has 0.5 to 30.0 MHz general coverage receive capability with 100 Hz resolution. The receive frequency can be changed instantly, independent of the transmit frequency.

**NOTE:** The selected frequency is used for temporary receiving (transmitting is not available). This frequency is cleared once the channel is changed. If you want to program a frequency, refer to p. 12.

◊ Using the channel selector

1. Select a channel which is programmed near the frequency you want to receive.
2. Push the [CE] key to select frequency selection mode.
   • “►” appears on the display.
3. Rotate the [CHANNEL] selector to change the frequency.
4. To return to the previous frequency, push [CE].
   • “►” disappears and the previous frequency or channel name appears.

◊ Using the keypad

**CAUTION:** A frequency can be entered into a user channel or ITU simplex channel by pushing the [RX] key. However, when pushing and holding the [RX] key after entering a frequency, the previously programmed contents are erased and cannot be retrieved. Therefore, keypad entry should be used only on spare channels.

1. Select the memory channel to be used for general coverage use.

![EXAMPLE]: Setting 12.3450 MHz

Select non frequency programmed channel.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>150</td>
<td>12345</td>
</tr>
<tr>
<td>150</td>
<td>123450</td>
</tr>
</tbody>
</table>

After temporarily receiving.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>123450</td>
</tr>
</tbody>
</table>

*Do not hold [RX] for more than 0.5 sec., otherwise the frequency will be programmed into the channel.*
Receive and Transmit

Basic voice receive and transmit

1. Check the following in advance:
   - Microphone is connected.
   - [SPEAKER] switch is turned off.
   - [SQL] switch is turned off.
   - [CLARITY] control is set to the center position.

2. Select the desired channel to be received with the [GROUP] and [CHANNEL] selectors.
   - When receiving a signal, the S-meter shows the signal strength.

3. Adjust [VOLUME] to the desired audio level when receiving a signal.

4. Push [MODE] to select the desired operating mode, if the received signal is in a different mode.

5. Push [TUNE] to tune the antenna tuner, if connected.
   - This operation is not necessary when "automatic tuning" is selected in set mode (p. 13).

6. To transmit on the channel, push and hold the PTT switch on the microphone.
   - "TUNE" flashes for 1 to 2 sec. for the first transmission on a channel when an antenna tuner is connected.

7. After the flashing stops, speak into the microphone at your normal voice level.
   - The RF meter shows the output power according to your voice level.

8. Release the PTT switch to return to receive.

Functions for transmit

- Transmit frequency check
  When "DUP" appears on the display such as for a ship-to-shore channel, the transmit frequency differs from the receive frequency.
  - In such cases, the transmit frequency should be monitored before transmitting to prevent interference to other stations.

- Transmit power selection
  The transceiver has 3 selectable output powers.*
  - High power allows longer distance communications and low power reduces power consumption.
  - *Only 2 selectable output powers are available with some versions. In this case, level 1 stands for 60 W (the same as level 2).

  **NOTE:** Low power setting affects all channels except the 2182 kHz emergency channel.

  **NOTE:** Although power selection appears possible with GMDSS versions, only high power is available.

  1. Push [FUNC] then [TX] to call up the following display.

  2. Rotate the [CHANNEL] selector to select high or low output power.
     - 3: high power (150 W PEP)
     - 2: middle power (60 W PEP)
     - 1: low power (20 W PEP)

  3. Push [FUNC] or [CE] to return to the previous display.
Functions for receive

◊ Squelch function
The squelch function detects signals with voice components and squelches (mutes) unwanted signals such as unmodulated beat signals. This provides quiet standby.

When you need to receive weak signals, the squelch should be turned off.

Push [SQL] to toggle the function on and off.

Push [SQL] to toggle the function on and off.

◊ Noise blanker
The noise blanker function reduces pulse type noise such as that coming from engine ignitions.

The noise blanker may distort reception of strong signals. In such cases, the noise blanker should be turned off.

Push [NB] to toggle the function on and off.

◊ AGC off function
The receiver gain is automatically adjusted according to received signal strength with the AGC (Automatic Gain Control) function to prevent distortion from strong signals and to obtain a constant output level.

When receiving weak signals with adjacent strong signals or noise, the AGC function may reduce the sensitivity. In this situation, the AGC function should be deactivated.

Push [AGC] to toggle the function on and off.

◊ RF gain setting
The receiver gain can be reduced with the RF gain setting. This may help to remove undesired weak signals while monitoring strong signals.

Usually, the AGC function reduces the RF gain according to the receive signal strength and these weak signals are remove. However, during no signal reception, these weak signals may not be heard.

In such cases, the RF gain may be useful for setting a minimum level at which to hear signals.

1. Push [FUNC] then [RX] to call up the following display.
2. Rotate the [CHANNEL] selector to set the desired minimum cutting level.
   • “0” to “9” are available.
   • S-meter shows the minimum permitted level.
3. Push [FUNC] or [CE] to exit the RF gain display.

◊ Clarity control
Voice signals received from other stations may be difficult to receive. This may sometimes happen if a station is transmitting slightly off frequency. In such cases, compensate the receive frequency only, using the [CLARITY] control.

Adjust [CLARITY] to improve the audio signal.
**CW operation**

The transceiver has the following CW keying features selectable in set mode as described on page 15.
- Full break-in (receiving is possible while transmitting)
- Delay keying (automatic transmission with keying)
- Off (manual transmission is necessary before keying)

1. Connect a CW keyer or an external electronic keyer to the ACC(1) socket as shown at right.
2. Select the desired channel to operate CW mode.
3. When the selected channel is not in A1A mode, push [MODE] one or more times to select “A1A.”
4. Operate the CW keyer to transmit a CW signal.

**NOTE:** CW mode is not available in some versions and CW narrow can be selected in set mode (p. 14) when an optional filter is installed (already built-in to the GMDSS versions).

**FSK operation**

The transceiver has FSK and J2B modes for FSK operation—use FSK when using the built-in oscillator; use J2B when using an AFSK terminal unit.

1. Connect an FSK terminal unit as shown at right.
2. Select the desired channel.
   - FSK ITU channel group, ch 4001 to ch 25040, are available depending on version.
3. Push [MODE] one or more times to select the type of emission, “FSK” or “J2B.”
4. Operate the FSK terminal unit.

**NOTE:**
- FSK shift frequency and FSK polarity can be adjusted in set mode (p. 14).
- Some transceivers may operate 1.7 kHz higher than the IC-M710RT’s J2B mode even when the same displayed frequencies are in use.

**Cross channel operation**

Cross channel operation is available with some versions to operate different channels for receive and transmit.

1. Select the desired channel for receive.
   - ITU simplex channels cannot be used.
2. Push [TX], then select the desired channel for transmit.
   - “**TX**” flashes after pushing [TX].
4. Operate the transceiver normally.
5. Change the channel to clear the cross channel setting.

*This function is available for Europe versions only.*
5

USER CHANNEL PROGRAMMING

Programming a frequency

The IC-M710RT has up to 160 user-programmable channels each with channel name capability of up to 7 alphanumeric characters.

**NOTE:** ITU simplex channels can be programmed as well as user channels. However, transmit frequencies cannot be programmed as it is not necessary.

### Receive frequency

1. Select the desired channel to be programmed.
   - Channels 1 to 160 (maximum) are programmable.
2. Push [CE] to select frequency selection mode.
   - "" and frequency appear on the display.
3. Enter the desired frequency via the keypad—5 or 6 digits.
   - Or rotate the [CHANNEL] selector to change the frequency.
4. To change the operating mode (type of emission), push [MODE] one or more times.
5. Push and hold [RX] for 1 sec. to program the user channel.

### Transmit frequency

(Not applicable for General versions)

1. Select the desired user channel to be programmed.
2. Push [TX].
   - "TX" flashes.
   - "" and frequency appear on the display.
4. Enter the desired frequency via the keypad with 5 or 6 digits.
   - The [CHANNEL] selector cannot be used.
5. Push and hold [TX] for 1 sec. to program.
6. Push [TX] to stop "TX" from flashing.

### Channel names

1. Select the desired user channel to be programmed.
3. Push [FUNC] then [CE].
   - The channel name (alphanumeric) readout flashes.
4. Rotate the [GROUP] selector for cursor position and the [CHANNEL] selector for name content.
   - To return to the previous message, push [CE].
5. Push and hold [RX] to program the name.
   - Flashing stops.

---

<table>
<thead>
<tr>
<th>Function</th>
<th>Display</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push [CE]</td>
<td>Frequency and &quot;&quot;</td>
<td>Set frequency, use keypad or channel selector.</td>
</tr>
<tr>
<td>Push [TX]</td>
<td>&quot;TX&quot; flashes</td>
<td>Push and hold [TX] after entering a frequency</td>
</tr>
<tr>
<td>Push [RX]</td>
<td>&quot;COMMENT&quot; stops</td>
<td>Push [RX] to program the name</td>
</tr>
</tbody>
</table>

Programming is completed.
Set mode operation

Set mode operation is used for programming infrequently changed values or conditions of functions.

**NOTE:** Some of the set mode items described in this section are not available on some transceiver versions.

1. Push [POWER] to turn power off, if necessary.
2. While pushing [FUNC] + [1], push [POWER] to turn power on and enter set mode.
3. Rotate the [GROUP] selector to select the desired item.
4. Rotate the [CHANNEL] selector to set the values or conditions for the selected item.
5. Turn power off and on again to exit set mode.

Set mode contents

### (1) FSK ITU channels
FSK ITU channels appear as a group between the ITU 25 MHz band and user channels. This FSK channel group can be hidden for voice communication only.

- **OFF**
  - FSK channels don’t appear (no SITOR operation). (default)
- **SITOR**
  - FSK channels appear (for SITOR operation).

### (2) Connected antenna tuner
The transceiver has several tuner control systems for use with an optional Icom antenna tuner. Select the condition depending on the connected antenna tuner.

**NOTE:** Internal switch selection may be required when using a non-Icom tuner (p. 23).

- **AT-130**
  - AT-130 (default)
- **AT-120**
  - AT-120
- **AH-3**
  - AH-3

### (3) Automatic tuning condition
When the optional AT-130 or AT-130E automatic antenna tuner is connected, tuning can be started automatically without the [TUNE] switch, for instant operation.

If manual tuning is required, this automatic operation can be deactivated.

- **on**
  - Tuning starts when pushing [PTT] on a new frequency.
- **off**
  - Tuning starts only when [TUNE] is pushed. (default)
6 SET MODE

(4) Scan type selection (scan-type only)
This item selects one of the following scan functions.
Channel scan and channel resume scan search 5 channels around a user selected channel or search all ITU channels in the band when an ITU channel is selected.
Programmed scan (optional) searches signals within the frequency range and activates slowly while squelch is open and fast while squelch is closed.

<table>
<thead>
<tr>
<th>CH</th>
<th>CH--TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC--TYPE</td>
<td>Channel scan Scan is canceled when transmitting. (default)</td>
</tr>
<tr>
<td>CH--RES</td>
<td>Channel resume scan Scan pauses when squelch opens, then resumes after 10 sec. (optional)</td>
</tr>
<tr>
<td>Pro</td>
<td>Channel resume scan Scan operates over the frequency range. (optional)</td>
</tr>
</tbody>
</table>

(5) Scan speed
This item adjusts the scan speed (rate at which channels are searched). The scan speed can be set from 1 to 10 with “1” being the fastest and “10” being the slowest.

<table>
<thead>
<tr>
<th>Fastest scan speed</th>
<th>Slowest scan speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SC--SP</td>
<td>10 SC--SP</td>
</tr>
</tbody>
</table>

(6) Channel name and frequency
The lower half of the display can be set to display a programmable channel name or a receive frequency according to operator needs.

<table>
<thead>
<tr>
<th>CH--Co</th>
<th>CH--DISP</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH--Fr</td>
<td>CH--DISP</td>
</tr>
</tbody>
</table>

(7) CW/FSK narrow filter
This item selects the passband width for A1A (CW), FSK or J2B mode.

*NOTE:* When “on” is selected without optional filter installation, the Marine and General versions do not function in these modes. The GMDSS versions can use “on” as standard.

<table>
<thead>
<tr>
<th>OFF</th>
<th>NAR--FIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>NAR--FIL</td>
</tr>
</tbody>
</table>

(8) FSK shift frequency
Several shift frequencies (the difference between the mark and space frequency) are used for FSK operation. This item allows you to select a shift frequency for almost any FSK system.

<table>
<thead>
<tr>
<th>170</th>
<th>Shift frequency: 170 Hz (default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>425</td>
<td>Shift frequency: 425 Hz</td>
</tr>
<tr>
<td>850</td>
<td>Shift frequency: 850 Hz</td>
</tr>
</tbody>
</table>
**SET MODE**

<table>
<thead>
<tr>
<th>(9) FSK polarity</th>
<th>Normal and reverse polarities are available for FSK operation. This item allows you to select one of these polarities.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>FSK normal</strong> (default)</td>
</tr>
<tr>
<td></td>
<td><strong>FSK reverse</strong></td>
</tr>
<tr>
<td></td>
<td><strong>FSK - REV</strong></td>
</tr>
<tr>
<td></td>
<td>“FSK-REV off” (normal): key open (mark); key close (space)</td>
</tr>
<tr>
<td></td>
<td>“FSK-REV on” (reverse): key open (space); key close (mark)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(10) CW break-in</td>
<td>The CW break-in function (in A1A mode) toggles transmit and receive with CW keying. Full break-in allows you to receive signals between transmitted keying pulses during CW transmission. Semi break-in allows you to mute receiving until keying stops with some delay time.</td>
</tr>
<tr>
<td></td>
<td><strong>Full break-in</strong> Automatic keying without delay time (default)</td>
</tr>
<tr>
<td></td>
<td><strong>Semi break-in</strong> Automatic keying with delay time</td>
</tr>
<tr>
<td></td>
<td><strong>OFF</strong> Manual transmission necessary for keying</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(11) Microphone keys</td>
<td>This item activates/deactivates the keys on the HM-120 HAND MICROPHONE (&quot;P&quot;, &quot;A&quot; and &quot;V&quot;). Refer to p. 4 to program the &quot;P&quot; key.</td>
</tr>
<tr>
<td></td>
<td><strong>on</strong> Microphone keys activated. (default)</td>
</tr>
<tr>
<td></td>
<td><strong>off</strong> Microphone keys deactivated.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(12) Remote control busy timer</td>
<td>This sets the time for which operation of one remote controller is inhibited while operating the other. The timer can be set from 0 to 180 sec.</td>
</tr>
<tr>
<td></td>
<td><strong>5</strong> Busy timer: 5 sec. (default)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(13) ID number setting for remote control</td>
<td>When connecting an external controller such as a personal computer, 2-digit ID codes are required to access the transceiver. The IC-M701RT adopts NMEA0183 format and uses a “proprietary sentence” for remote control. ID 01 to 99 are available.</td>
</tr>
<tr>
<td></td>
<td><strong>03</strong> NMEA ID: 03 (default)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>(14) Remote control input terminal</td>
<td>Remote control signals can be input via the [RS-232C] socket or [CLONE] jack.</td>
</tr>
<tr>
<td></td>
<td><strong>d - S ub</strong> [REMOTE] socket (default)</td>
</tr>
<tr>
<td></td>
<td><strong>P in</strong> [CLONE] jack</td>
</tr>
</tbody>
</table>


CONNECTIONS AND INSTALLATION

Supplied accessories
- DC power cable (OPC-568) ........................................ 1
- Mounting bracket .................................................. 1
- Bracket knobs (8820000170) ........................................ 4

Connectors
- DIN connector (8-pin for ACC1) ................................. 1
- DIN connector (7-pin for ACC2) ................................. 1
- Tuner connector (56100000150) ............................... 1
- Pins for tuner connector (6510019030) ...................... 4
- DIN connector cover (GMDSS only—attach to the ACC sockets) ................................. 1

Nuts and bolts
- Allen bolt (M6 × 50) ............................................... 4
- Self-tapping screws (M6 × 30) .................................. 4
- Nuts (M6; use 2 pcs. for each bolt) .......................... 8
- Flat washers (M6) ..................................................... 8
- Spring washers (M6) ................................................. 4
- Self-tapping screws (3.5 × 30 for mic. hanger) ........... 2

Fuses
- FGB 30 A (rear panel) ............................................. 2
- FGB 5 A (internal) ................................................... 2

RC-21 (Remote Controller) Accessories
- Microphone (HM-120*) ............................................. 1
- Microphone hanger* ............................................... 1
- DC power cable (OPC-775) ....................................... 1
- Mounting bracket .................................................. 1
- Bracket knobs ....................................................... 2

Nuts and bolts
- Self-tapping screws* (3.5 × 30 for mic. hanger) ........... 2
- Flat washers (M5) ..................................................... 2
- Nuts (M6; use 2 pcs. for each bolt) .......................... 10
- Spring washers (M6) ............................................... 5
- Allen bolt (M6 × 50) ............................................... 5
- Self-tapping screws ................................................. 5
- Flat washers (M6) ..................................................... 10
- Ground lug (M5) ..................................................... 1

Fuses
- FGB 30 A (rear panel) ............................................. 2
- FGB 5 A (internal) ................................................... 2
*Depends on version.

Attaching 1 remote controller
## Attaching 2 remote controllers

### Set ID number
The ID numbers for each remote controller must be set properly for the intercom function to operate (see right).

1. While pushing [FUNC] + [–], push [POWER].
2. Rotate the channel selector to select the desired unit ID number if desired.
3. Push [POWER] turn the power OFF.

### Intercom operation
The intercom function allows you to communicate between two remote controllers.

1. Push [FUNC] and then push [SPEAKER] to turn the intercom function ON.
2. Push and hold the [PTT] switch on the microphone and speak into the microphone at a normal voice level.
3. When neither remote controller is used to transmit for 30 sec, the intercom function is automatically cancelled.
7 CONNECTIONS AND INSTALLATION

- Attaching 2 remote controllers and a PC

- Notes for remote control

- When more than 1 controller (incl. PC) is connected, the controller (or PC) being operated at any given time has priority.

- When more than 1 controller (incl. PC) is connected, the controller (or PC) not being operated is inhibited for a specified time after another controller (or PC) is operated. This time can be programmed by your dealer. The default inhibit time is 5 sec.

- Volume adjustment is independently controlled by each remote controller (PC).

- The optional RS-M710RT software allows you to program memory channels not available through regular IC-M710RT operation. Refer to the RS-M710RT online help for details.

> CAUTION: The rear of any connected remote controller must be properly grounded. We suggest using a wide copper ribbon. (p. 22)
CONNECTIONS AND INSTALLATION

**Connections on rear panel**

- **ANTENNA CONNECTOR** (p. 23)
  Connects a 50 Ω HF band antenna with a 50 Ω matched coaxial cable and a PL-259 plug.

- **GROUND TERMINAL**
  **IMPORTANT!** Connects a ship’s (or vehicle’s) ground. See p. 22 for details.

- **ACC(1) and ACC(2) SOCKETS**
  See p. 20 for details.

- **CLONE JACK**
  For Dealer use only.

- **DSC or REMOTE SOCKETS** (p. 21)
  ➡ DSC socket for GMDSS versions—connects an optional GM-110DSC **DSC TERMINAL UNIT**.
  ➡ REMOTE socket for Marine and General versions.

- **MOD/AF SOCKET** (GMDSS versions only)
  Connects an external terminal unit.

- **TUNER RECEPTACLE**
  Connects a control cable to an optional AT-130 or AT-130E **ANTENNA TUNER**. A female connector is supplied for connection.

- **DC POWER RECEPTACLE**
  Connects to a regulated 12–16 V DC power source such as a 12 V battery or DC power supply using the supplied DC power cable.

  ➾ **CAUTION: DO NOT** connect to a 24 V battery. This will damage the transceiver.

- **FUSE HOLDERS**
  Hold two 30 A fuses for +ve and –ve terminals. Replace both fuses when one fuse is blown.

---

**NOTE:** To meet European GMDSS regulations, the following must be connected to the IC-M710RTGMDSS:

- GM-110 **DSC TERMINAL UNIT**
- PS-65 (or 66) **DC-DC CONVERTER UNIT**
- AT-130E **AUTOMATIC ANTENNA TUNER**

---

Optional AT-130

12 V battery
## Connector information

### ACC(1)*

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CWK</td>
<td>CW and FSK keying input.</td>
<td>Input level: Less than 0.6 V for transmit.</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Connects to ground.</td>
<td>Connected in parallel with ACC(2) pin 2.</td>
</tr>
<tr>
<td>3</td>
<td>SEND</td>
<td>Input/output pin. Goes to ground when transmitting. When grounded, transmit.</td>
<td>Ground level: −0.5 to 0.8 V, Input current: Less than 20 mA, Connected in parallel with ACC(2) pin 3.</td>
</tr>
<tr>
<td>4</td>
<td>MOD</td>
<td>Modulator input. Usable when pin 3 is grounded.</td>
<td>Input impedance: 10 kΩ, Input level: Approx. 100 mV rms</td>
</tr>
<tr>
<td>5</td>
<td>AF</td>
<td>AF detector output. Fixed, regardless of [AF] position.</td>
<td>Output impedance: 4.7 kΩ, Output level: 100–300 mV rms</td>
</tr>
<tr>
<td>6</td>
<td>SCAN</td>
<td>Starts scan when grounded.</td>
<td>Scan operation: Less than 0.6 V</td>
</tr>
<tr>
<td>7</td>
<td>13.6 V</td>
<td>13.6 V output when power is ON.</td>
<td>Output current: Max. 1 A, Connected in parallel with ACC(2) pin 7.</td>
</tr>
<tr>
<td>8</td>
<td>ALC</td>
<td>ALC voltage</td>
<td>Control voltage: −3 to 0 V, Input impedance: More than 10 kΩ, Connected in parallel with ACC(2) pin 5.</td>
</tr>
</tbody>
</table>

*ACC(1): Marine and general versions only.

### ACC(2)*

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 V</td>
<td>Regulated 8 V output.</td>
<td>Output voltage: 8 V ±0.3 V, Output current: Less than 10 mA</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Same as ACC(1) pin 2.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SEND</td>
<td>Same as ACC(1) pin 3.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>No connection.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ALC</td>
<td>Same as ACC(1) pin 8.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RLC</td>
<td>T/R relay control output.</td>
<td>When transmitting: 0 V (less than 0.5 A)</td>
</tr>
<tr>
<td>7</td>
<td>13.6 V</td>
<td>Same as ACC(1) pin 7.</td>
<td></td>
</tr>
</tbody>
</table>


### MICROPHONE

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MIC+</td>
<td>Audio input from the microphone element.</td>
<td>Input impedance: 600 Ω</td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
<td>No connection.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AF1</td>
<td>AF output controlled with [VOLUME]. Connected to pin 4 in the microphone.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>AF2</td>
<td>AF input. Connected to pin 3 in the microphone.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PTT</td>
<td>PTT switch input.</td>
<td>When grounded, transmits.</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>Connected to ground.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>MIC−</td>
<td>Coaxial ground for MIC+.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>AF−</td>
<td>Coaxial ground for AF1 and AF2.</td>
<td></td>
</tr>
</tbody>
</table>

### TUNER

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KEY</td>
<td>Key signal input.</td>
<td>−0.5 to 0.8 V during tuning.</td>
</tr>
<tr>
<td>2</td>
<td>START</td>
<td>Start signal output.</td>
<td>Pulled up 8 V, 0 V (100 msec) as a start signal.</td>
</tr>
<tr>
<td>3</td>
<td>13.6V</td>
<td>13.6 V output.</td>
<td>Maximum current: 2 A</td>
</tr>
<tr>
<td>4</td>
<td>E</td>
<td>Negative terminal.</td>
<td>USA version (See below for Europe version.)</td>
</tr>
<tr>
<td>5</td>
<td>ANTC</td>
<td>Antenna current input.</td>
<td>Input level: Approx. 2 V rms</td>
</tr>
</tbody>
</table>
## CONNECTIONS AND INSTALLATION

### DSC

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
</table>
| 1   | DMD+     | Modulation input from a DSC terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 0.75 V rms |
| 2   | DMD−     | Coaxial ground for DMD+. | |
| 3   | DAF+     | AF detector output for a DSC terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 0.25–2.5 V rms |
| 4   | DAF−     | Coaxial ground for DAF+. | |
| 5   | NMI+     | NMEA data output. | NMEA standard format/level. |
| 6   | NMI−     | Coaxial ground for NMI+. | |
| 7   | NMO+     | NMEA data output. | NMEA standard format/level. |
| 8   | NMO−     | Coaxial ground for NMO+. | |
| 9   | GND      | Ground for digital equipment. | |

### MOD/AF

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
</table>
| 1   | NMD+     | Modulation input for an external terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 100 mV rms |
| 2   | NMD−     | Coaxial ground for NMD+. | |
| 3   | NAF+     | AF detector output for an external terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 0.25–2.5 V rms |
| 4   | NAF−     | Coaxial ground for NAF+. | |
| 5   | NSEN     | Transmits when grounded. | Ground level: 0.5 to 0.8 V  
Input level: Less than 20 mA |
| 6   | NC−      | No connection. | |
| 7   | NC       | No connection. | |
| 8   | NC−      | No connection. | |
| 9   | GND      | Ground for digital equipment. | |

### REMOTE

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
</table>
| 1   | MOD+     | Modulation input from an external terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 100 mV rms |
| 2   | MOD−     | Coaxial ground for MOD+. | |
| 3   | AF+      | AF detector output for an external terminal unit. | Input impedance: 600 Ω  
Input level: Approx. 0.25–2.5 V rms |
| 4   | AF−      | Coaxial ground for AF+. | |
| 5   | NMI+     | NMEA data output. | NMEA standard format/level. |
| 6   | NMI−     | Coaxial ground for NMI+. | |
| 7   | NMO+     | NMEA data output. | NMEA standard format/level. |
| 8   | NMO−     | Coaxial ground for NMO+. | |
| 9   | GND      | Ground for digital equipment. | |

### DC 13.6V

<table>
<thead>
<tr>
<th>PIN</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 4, 7</td>
<td>⊗</td>
<td>DC input (positive).</td>
<td>Max. power consumption: 30 A</td>
</tr>
<tr>
<td>2, 5, 8</td>
<td>⊗</td>
<td>DC input (negative).</td>
<td></td>
</tr>
</tbody>
</table>

---

**Note:** The symbols ⊗ indicate that the input can be either positive or negative, depending on the configuration.
7 CONNECTIONS AND INSTALLATION

Ground connection

The transceiver, remote controller RC-21 and antenna tuner MUST have an adequate ground connection. Otherwise, the overall efficiency of the transceiver and antenna tuner installation will be reduced. Electrolysis, electrical shocks and interference from other equipment could also occur.

For best results, use the heaviest gauge wire or strap available and make the connection as short as possible. Ground the transceiver, RC-21 and antenna tuner to one ground point, otherwise voltage differences between 2 ground points may cause electrolysis.

CAUTION: The IC-M710RT has either a negative ground or floating ground depending on version. NEVER connect the negative ground type to a "plus-grounding ship," otherwise the transceiver will not function.

Ground system example

<table>
<thead>
<tr>
<th>Good ground points</th>
<th>Acceptable ground points</th>
<th>Undesirable ground points</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ship's ground terminal</td>
<td>• Stainless steel tuna tower</td>
<td>• Engine block</td>
</tr>
<tr>
<td>• External ground plate</td>
<td>• Stainless steel stanchion</td>
<td>• Keel bolt</td>
</tr>
<tr>
<td>• External copper screen</td>
<td>• Through mast</td>
<td>• Unsuitable ground points</td>
</tr>
<tr>
<td></td>
<td>• Through hull</td>
<td>• Gas or electrical pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fuel tank or oil-catch pan</td>
</tr>
</tbody>
</table>

Power source

The transceiver requires regulated DC power of 13.6 V and at least 30 A. There are 3 ways to supply power:

• Direct connection to a 12 V battery in your ship through the supplied DC power cable.
• Use the PS-60 DC POWER SUPPLY to connect to an AC outlet.
• Use the PS-66 DC-DC CONVERTER to connect to a 19–32 V DC power source.

CAUTION: The supplied DC power cable MUST be used to provide power to the transceiver. AVOID exceeding the 3 m (10 ft) length of the DC power cable. If it is necessary to make a run of over 3 m, use #6 or similar weight cable instead of the supplied DC power cable for a maximum run of 6 m (20 ft).
Antenna

Most stations operate with a whip or long wire (insulated backstay) antenna. However, these antennas cannot be connected directly to the transceiver since their impedance may not be matched with the transceiver antenna connector.

With a 50 Ω matched antenna all marine bands cannot be used. The following antenna matcher or antenna tuner may be helpful for antenna installation.

MN-100/MN-100L ANTENNA MATCHERS

AT-130/AT-130E AUTOMATIC ANTENNA TUNER

Non-Icom tuner

Some non-Icom tuners may be used with the IC-M. Please consult your dealer or marina if you wish to connect one. The following internal settings may be required for connection.

- Supplies 8 V when pushing [TUNE].
- Grounded when pushing [TUNE]. (used for AT-130/E—default)
- Accepts “LOW” as an answer back signal. (used for AT-130/E—default)
- Accepts “HIGH” as an answer back signal. (used for AT-130/E—default)
7 CONNECTIONS AND INSTALLATION

Mounting

Mounting location
Select a location that provides easy access to the front panel for navigation safety, has good ventilation and is not subject to sea spray. The controller should be at 90 degrees to your line of sight when operating it.

CAUTION: KEEP the transceiver and microphone at least 1 meter away from your vessel's magnetic navigation compass.

Check the installation angle; the display may not be easy to read at some angles.

Mounting the controller/main body

Transceiver dimensions

292 mm (11 1/2 in)
66 mm (2 3/8 in)

116 mm (4 1/16 in)

116 mm (4 1/16 in)
317 mm (12 1/16 in)
### Installing internal options

#### Opening the case
Follow the case and cover opening procedures shown here when you want to install an option or adjust a setting for non-Icom tuner control.

1. Remove the 9 screws from the rear panel, then remove the rear frame and rear sealing.
2. Remove the transceiver case.
3. When reassembling the transceiver, check the following points:
   - Internal fan and slits in the case are on the same side.
   - Front sealing is mated correctly.
   - Rear sealing is attached in the proper orientation.
   - Screws are tightened securely.

#### Installing an optional filter and alarm unit
After opening the case as shown above, install the desired option to the position as at right. These options are available (or already built-in) for the following versions:

<table>
<thead>
<tr>
<th>Version</th>
<th>Marine</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL-100</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>UT-95</td>
<td>built-in</td>
<td>optional</td>
</tr>
</tbody>
</table>

After installing the 2-tone alarm unit into a General version, remove the plastic cover on the [ALARM] switch to use the switch.

### Fuse replacement
The transceiver has 3 fuses to protect internal circuitry, 2 fuses for the fuse holder on the rear panel and 1 for inside. If the transceiver stops functioning, check the fuses below.
TROUBLESHOOTING

What appears to be equipment malfunction may not be damaging or difficult to solve. Check the following chart before making any adjustments or sending the transceiver to an Icom Service Center.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
<th>REF.</th>
</tr>
</thead>
</table>
| **POWER** | Power does not come on when [POWER] is pushed. | • Power cable is improperly connected.  
• Blown fuse. | • Reconnect the cable securely.  
• Check for cause, then replace the fuse with a spare one. | p. 19  
p. 25 |
| No sound comes from the speaker. | • The [SPEAKER] switch is turned ON.  
• Microphone is not connected.  
• RF gain is set too deeply and several segments of the S-meter appear.  
• The squelch is closed. | • Turn OFF the [SPEAKER] switch.  
• Connect the microphone to the [MICROPHONE] connector.  
• Push [FUNC], then [RX] to reset the RF gain. (RF GAIN 9 applies audio.)  
• Push [SQL] switch to turn the squelch OFF. | p. 2  
p. 2  
p. 10  
p. 10 |
| Sensitivity is low and only strong signals are audible. | • Antenna is not properly matched to the operating frequency.  
• RF gain is set too deeply.  
• Wrong tuner condition is selected in set mode. | • Push [TUNE] to tune the connected antenna tuner or select “automatic tuning” using set mode when an optional AT-130/E is connected.  
• Push [FUNC], then [RX] to reset the RF gain.  
• Set to the proper condition for the connected tuner. | p. 13  
p. 10  
p. 13 |
| Received audio is unclear or distorted. | • Wrong type of emission is selected.  
• AGC is deactivated while receiving a strong signal.  
• Noise blanker is turned ON when receiving a strong signal.  
• The [CLARITY] control is rotated too far clockwise or counterclockwise. | • Push [MODE] to select the proper operating mode.  
• Push [AGC] to activate the AGC function.  
• Push [NB] to turn the noise blanker OFF.  
• Adjust the [CLARITY] control to receive proper audio output. | p. 9  
p. 10  
p. 10  
p. 10 |
| Your signal does not reach as far away as usual. | • The transmit power is set low.  
• Antenna tuner is improperly matched to the operating frequency when manual tuning is selected.  
• CW or FSK mode is selected for voice transmission. | • Push [FUNC], then [TX] to reset the transmit power. (RF-PWR 3 is maximum power.)  
• Push [TUNE] to tune the connected antenna tuner or select “automatic tuning” using set mode.  
• Push [MODE] to select 3E mode (or H3E, R3E, etc.). | p. 9  
p. 9 or  
p. 13  
p. 9 |
| Transmit signal is unclear or distorted. | • Wrong type of emission is selected.  
• Microphone is too close to your mouth. | • Push [MODE] to select the proper operating mode.  
• Speak into the microphone naturally and do not hold the microphone too close to your mouth. | p. 9  
— |
| No contact is possible with another station. | • Wrong transmit frequency is set. | • Push [TX FREQ] to check and store the correct transmit frequency. | p. 8 |
| Frequency cannot be set via the keypad. | • The [CE] key is not pushed (?* does not appear) before digit entry.  
• 2182 kHz is selected with the [2182KHz] switch. | • Push [CE] (?* appears), then enter the desired frequency.  
• Push [2182KHz], then set the frequency. | p. 8  
p. 6 |
| FSK ITU channels cannot be selected. | • SITOR operation is set OFF in set mode. | • Set “SITOR” to ON in set mode. | p. 13 |
OPTIONS AND SPECIFICATIONS

■ Specifications

GENERAL
• Frequency coverage:
  Receive 500 kHz–29.9999 MHz
  Transmit 1.6–27.5 MHz
• Mode: J3E (USB/LSB), H3E, J2B (AFSK), F1B (FSK), R3E, A1A (CW); available modes differ with version
• Number of channels: 1136 channels (max.)
  160 user programmable, 242 ITU SSB duplex, 72 ITU SSB simplex, 662 ITU FSK duplex
• Antenna impedance: 50 Ω nominal
• Usable temp. range: –30°C to +60°C (–22°F to +140°F)
• Frequency stability (-20°C to +60°C):
  0.5–14.9999 MHz ±10 Hz
  15–29.9999 MHz ±20 Hz (GMDSS ±10 Hz)
• Power supply requirement: 13.6 V DC±15%
  Maximum current drain (at 13.8 V DC):
    Main unit 30 A (transmit at max. power)
    Controller 1.2 A (receive at max. audio)
• Dimensions (projections not included):
  Main unit 292(W) × 117(H) × 317(D) mm
  Controller 292(W) × 116(H) × 68(D) mm
• Weight:
  Main unit 7.45 kg; 16 lb 7 oz (negative ground)
  Controller 1.2 kg; 2 lb 12 oz

■ Options

GM-110DSC DSC TERMINAL UNIT
6 channel emergency scanning receiver for distress calls, selective calls, etc. Distress switch box attached.

AT-130/E AUTOMATIC ANTENNA TUNER
Matches the transceiver to a long wire antenna with a minimum of insertion loss.

OPC-566 SHIELDED CONTROL CABLE
Shielded control cable helps protect the transceiver from RF feedback and extends separation between tuner and transceiver up to 10 m.

MN-100 ANTENNA MATCHER
Matches the transceiver to a dipole antenna. Covers all HF bands from 1.5 to 30 MHz. 8 m × 2 antenna wires come attached.

MN-100L ANTENNA MATCHER
Matches the transceiver to a dipole antenna. Covers all HF bands from 1.5 to 30 MHz. 15 m × 1 antenna wire comes attached.

AH-710 FOLDED DIPOLE ANTENNA
Covers from 1.9 to 30 MHz band. Has an SO-239 connector. Easy to assemble (non-kink construction).

PS-60 DC POWER SUPPLY
Provides 13.6 V DC (30 A) output from a AC outlet.

PS-65/66 DC-DC CONVERTER
Provides 13.6 V DC (30 A) output from a 10.5–16 V (PS-65) or 19–32 V (PS-66) DC power source.

TRANSMITTER
• Output power:
  Below 25 MHz 150/60/20* W PEP
  125 W PEP (GMDSS only*2)
  Above 25 MHz 60/20* W PEP
  85 W PEP (GMDSS only*2)
  *Except for Europe versions. *2The output power of GMDSS versions is provided by the AT-130/E antenna tuner.
• Spurious emissions: –65 dB (USA); –60 dB (Europe)
• Carrier suppression: 40 dB
• Unwanted sideband suppression: 55 dB
• Microphone impedance: 600 Ω

RECEIVER
• Sensitivity:
  J3E, R3E, J2B, A1A, F1B (for 12 dB SINAD) 1.0 µV (1.6–1.7999 MHz)
  0.5 µV (1.8–29.9999 MHz)
  H3E (for 10 db S/N) 32 µV (0.5–1.5999 MHz)
  6.3 µV (1.6–1.7999 MHz)
  3.2 µV (1.8–19.9999 MHz)
• Spurious response rejection ratio:
  J3E, R3E, J2B, A1A, F1B (for 12 dB SINAD) 6.3 µV (0.5–1.5999 MHz)
  29.9999 MHz) More than 70 dB
• Audio output power: 4.5 W (at 10% distortion with a 4 Ω load)
• Audio output impedance: 4 to 8 Ω
• Clarity variable range: ±150 Hz

All stated specifications are subject to change without notice or obligation.