INSTRUCTION MANUAL

VHF MARINE TRANSCEIVER
IC-M3A

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

Icom Inc.
FOREWORD

Thank you for purchasing this Icom product. The IC-M3A VHF MARINE TRANSCEIVER is designed and built with Icom's superior technology and craftsmanship. With proper care this product should provide you with years of trouble-free operation.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS INSTRUCTION MANUAL—This instruction manual contains important operating instructions for the IC-M3A.

FEATURES

Water-resistant construction
Built tough to withstand the punishing marine environment, the IC-M3A meets JIS water-resistant specification grade 4.

Dual watch and tri-watch functions
Convenient functions which allow you to monitor the distress channel (ch 16) while receiving a channel of your choice—dual watch; or monitor the distress channel and another channel while receiving a channel of your choice—tri-watch.

Large, easy-to-read LCD
With dimensions of 18(H) × 32(W) mm, the IC-M3A's function display is easy to read and shows operating conditions at a glance. Backlighting and contrast can be adjusted to suit your preferences.

Simple operation
Ergonomic design with a minimum number of switches and controls provides simple intuitive operation.

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<td>NOTE</td>
<td>If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.</td>
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CAUTIONS

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

⚠️ WARNING! NEVER hold the transceiver so that the antenna is very close to, or touching exposed parts of the body, especially the face or eyes, while transmitting. The transceiver will perform best if the microphone is 5 to 10 cm away from the lips and the transceiver is vertical.

NEVER connect the transceiver to a power source other than the BP-204. Such a connection will ruin the transceiver.

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

KEEP the transceiver out of the reach of children.

KEEP the transceiver at least 1 meter away from your vessel’s magnetic navigation compass.

IN CASE OF EMERGENCY

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

Ο USING CHANNEL 16

DISTRESS CALL PROCEDURE

1. “MAYDAY MAYDAY MAYDAY.”
2. “THIS IS .........................” (name of vessel)
3. Your call sign or other indication of the vessel.
4. “LOCATED AT ......................” (your position)
5. The nature of the distress and assistance required.
6. Any other information which might facilitate the rescue.
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Priorities
- Read all rules and regulations pertaining to priorities and keep an up-to-date copy handy. Safety and distress calls take priority over all others.
- You must monitor channel 16 when you are not operating on another channel.
- False or fraudulent distress calls are prohibited under law.

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

Radio licenses
SHIP STATION LICENSE
When your craft is equipped with a VHF FM transceiver, 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. This license includes the call sign which is your craft’s identification for radio purposes.

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 near the transceiver 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, ends the call and makes the necessary log entries.

A current copy of the applicable government rules and regulations is only required to be on hand for vessels in which a radio telephone is compulsory. However, even if you are not required to have these on hand it is your responsibility to be thoroughly acquainted with all pertinent rules and regulations.

NOTE: Even though the IC-M3A is capable of operation on VHF marine channels 3, 21, 23, 61, 64, 81, 82 and 83, according to FCC regulations these simplex channels cannot be lawfully used by the general public in USA waters.
Front panel

1 DUALWATCH /TRI-WATCH SWITCH [DW•TRI]
   • Starts dualwatch when pushed momentarily.
   • Starts tri-watch when pushed for 1 sec.
   • Stops dualwatch/tri-watch when either is activated.

2 SQUELCH SWITCH [SQL]
   • Push this switch, then set the squelch level with the UP/DOWN [▲]/[▼] switches. (p. 6)

3 CHANNEL 16 SWITCH [16 • 9]
   • Selects channel 16 when pushed.
   • Selects the call channel when pushed for 1 sec.
   • Enters call channel write mode when the call channel is selected and this switch is pushed for 3 sec.

4 CHANNEL/WEATHER CHANNEL SWITCH [CH/WX•U/I/C]
   • Selects and toggles the regular channels and weather channel when pushed momentarily.
   • Selects one of 3 regular channels in sequence when pushed for 1 sec.

5 SCAN/TAG SWITCH [SCAN • TAG]
   • Starts and stops normal or priority scan when tag channels are programmed.
   • Sets and clears the displayed channel as a tag (scanned) channel when pushed for 1 sec.
   • While pushing this switch, turn the power ON to clears all tag channels in the selected regular channel group.

6 TRANSMIT POWER/LOCK SWITCH [H/L • LOCK]
   • Toggles high and low power when pushed.
   • Toggles the lock function ON/OFF when pushed for 1 sec.

7 CHANNEL UP/DOWN SWITCHES [▲]/[▼]
   • Select an operating channel in the selected channel group.
   • Selects the set mode condition of the item.

- International, U.S.A. and Canadian channels are available.
Top and side panels

1. PTT SWITCH [PTT]
   Push and hold to transmit; release to receive.

2. VOLUME CONTROL [OFF/VOL]
   Turns power ON and adjusts the audio level.

3. ANTENNA CONNECTOR
   Connects the supplied antenna.

- BATTERY CASE RELEASE BUTTON
  To remove the battery case:
  Push and hold the battery release button downwards, then open the battery case as shown below.
  To attach the battery case:
  Mate the notched ends of the transceiver and battery case, and click the battery case into place.
Function display

1. TRANSMIT INDICATOR
   Appears while transmitting. (p. 8)

2. BUSY INDICATOR
   Appears when receiving a signal or when the squelch level is set to the “OFF” position. (p. 8)

3. CALL CHANNEL INDICATOR
   Appears when the call channel is selected. (p. 9)

4. LOW POWER INDICATOR
   Shows that low output power is selected.

5. WEATHER ALERT INDICATOR
   Appears while the weather alert function is activated; blinks when an alert tone is received.

6. LOW BATTERY INDICATOR
   Blinks when the battery voltage drops to approx. 6 V or below. The attached Ni-Cd batteries require charging in this case.

7. LOCK INDICATOR
   Appears while the lock function activated.

8. SCAN INDICATOR
   Blinks while scanning.

9. DUALWATCH/TRI-WATCH INDICATORS
   “DUAL” appears during dualwatch; “TRI” appears during tri-watch. (p. 10)

10. DUPLEX INDICATOR
    Appears when a duplex channel is selected.

11. SET MODE INDICATOR
    Shows the set mode items. (pgs. 13)

12. CHANNEL INDICATOR
    • Indicates the selected operating channel number. (p. 6)
    • In set mode, indicates the selected condition. (p. 13)

13. MODE INDICATORS (p. 6)
    • “USA” shows that USA channels are selected.
    • “CAN” shows that Canadian channels are selected.
    • “INT” shows that international channels are selected.
    • “WX” shows that weather channels are selected.

14. TAG CHANNEL INDICATOR
    Appears when a tag channel is selected.
Channel selection

Channel 16
Channel 16 is the distress channel. It is used for establishing initial contact with another station and for emergency communications. Channel 16 is monitored during dualwatch/tri-watch. While standing by you are required to monitor channel 16.

Channel 9 (Call channel)
Channel 9 is the leisure-use call channel. Each regular channel group has a separate call channel. The call channel is monitored during tri-watch. The call channels can be programmed (p. 9) and are used to store your most often-used channels in each channel group for quick recall.

- Push [16 • 9] for 1 sec. to select the call channel for the selected channel group.
- “CALL” and call channel number appear.
- Each channel group can have its own call channel after changing a call channel.

U.S.A., Canadian and international channels
There are 61 U.S.A., 57 Canadian and 57 international channels. These channel groups may be specified for the operating area.

1. Push [CH/WX] to select a regular channel.
   - If a weather channel appears, push [CH/WX] again.
2. Push [▲] /[▼] switches to select a channel.
   - “DUP” appears for duplex channels.
3. To change the channel group, push [CH/WX • U/I/C] for 1 sec.
   - U.S.A., Canadian and international channels can be selected in sequence.

Push for 1 sec.  U.S.A. channels

International channels

Canadian channels
3 BASIC OPERATION

◇ Weather channels
There are 10 weather channels. These are used for monitoring weather channels from the NOAA (National Oceanographic and Atmospheric Administration) broadcasts.

The IC-M3A can detect a weather alert tone on a selected weather channel while scanning. See the “SET mode items” on p. 12.

- Push [CH/WX] to select weather channels.

■ Lock function
This function electronically locks all keys and switches to prevent accidental frequency changes and function access.

- Push [H/L • LOCK] for 1 sec. to turn the lock function ON and OFF.
  - Only [PTT], [H/L] and [SQL] are functional.

Adjusting the squelch level
The IC-M3A has a squelch even though there is no control knob for it. In order to receive signals properly, as well as for scan to function, the squelch must be adjusted to a suitable level.

Level 10: Max. squelch level

1 Push [SQL], then select the squelch level with the [▲]/[▼] keys.
   - There are 11 squelch levels to choose from: OFF is completely open; 10 is the maximum squelch level.
   - When no key pushes within 5 sec., the display returns to normal indication.

2 Push [SQL] once more when the desired squelch level is indicated in the function display.
   - The display returns to normal indication.
Receiving and transmitting

**CAUTION**: Transmitting without an antenna may damage the transceiver.

1. Rotate [OFF/VOL] clockwise to turn power ON, then set to the 10 o'clock position.
   - Use the squelch function to mute any audio noise if necessary.
   - Refer to the previous page for details.
2. Push [▲]/[▼] to select the desired channel.
   - When receiving a signal, BUSY appears and audio is emitted from the speaker.
   - Further adjustment of [OFF/VOL] may be necessary at this point.
3. Push [H/L] to select the output power if necessary.
   - "LOW" appears when low power is selected.
   - Choose low power to conserve battery power, choose high power for longer distance communications.
   - Some channels are for low power only.
4. Push and hold [PTT] to transmit, then speak into the microphone.
   - TX appears.
   - Channel 70 cannot be used for transmission (for GMDSS use).
5. Release [PTT] to receive.

**IMPORTANT**: To maximize the readability of your transmitted signal, pause a few sec. after pushing [PTT], hold the microphone 5 to 10 cm (2 to 4 inches) from your mouth and speak at a normal voice level.

**NOTE**: The transceiver has power save function to conserve the battery power and cannot be turned OFF. The power save function activates automatically when no signal is received for 5 sec.
3  BASIC OPERATION

■ Call channel programming

The call channel switch is used to select channel 9 by default, however, you can program your most often-used channels in each channel group for quick recall.

1. Push [CH/WX • U/I/C] for 1 sec. several times to select the desired channel group (USA, INT, CAN) to be programmed.

2. Push [16 • 9] for 1 sec. to select the call channel of the selected channel group.
   - "CALL" and call channel number appear.

3. Push [16 • 9] again for 3 sec. (until long beep changes to 2 short beeps) to enter call channel programming condition.
   - Call channel number and channel group to be programmed flash.

4. Push [▲]/[▼] to select the desired channel.

5. Push [16 • 9] to program the displayed channel as the call channel.
   - The call channel number and channel group stop flashing.

■ Automatic backlighting

This function is convenient for nighttime operation. The automatic backlighting can be activated in SET mode. (p. 12)

- Push any key except for [PTT] to turn the backlighting ON.
  - The backlighting is automatically turned OFF after 5 sec. of inactivity.
- **Description**

Dualwatch monitors channel 16 while you are receiving another channel; tri-watch monitors channel 16 and the call channel while receiving another channel.

- **Operation**

1. Select the desired operating channel.
2. Push [DW • TRI] momentarily to start dualwatch; push [DW • TRI] for 1 sec. to start tri-watch.
   - "DUAL" flashes during dualwatch; "TRI" flashes during tri-watch.
   - Beep tones sound when a signal is received on channel 16.
   - Tri-watch becomes dualwatch when receiving a signal on the call channel.
3. To cancel dualwatch/tri-watch, push [DW • TRI] again.

- **[Example]: Operating tri-watch on INT channel 07.**

Push for 1 sec.

- The tri-watch starts.

Signal is received on call channel.

Signal received on channel 16 takes priority.

Tri-watch resumes after the signal disappears.

- If a signal is received on channel 16, dualwatch/tri-watch pauses on channel 16 until the signal disappears.
- If a signal is received on the call channel during tri-watch, tri-watch becomes dualwatch until the signal disappears.
- To transmit on the selected channel during dualwatch/tri-watch, push and hold [PTT].
Scan types

Scanning is an efficient way to locate signals quickly over a wide frequency range. The transceiver has a priority scan and a normal scan.

In addition, weather alert functions is available for standby convenience. (p. 13)

Set the tag channels (channels to be scanned) before scanning. Clear the tag channels which inconveniently stop scanning, such as those used for digital communications.

NOTE: Choose priority or normal scan in SET mode. (P. 12)

Priority scan searches through all tag channels in sequence while monitoring channel 16. When a signal is detected on channel 16, scan pauses until the signal disappears; when a signal is detected on a channel other than channel 16, scan becomes dualwatch until the signal disappears.

Normal scan, like priority scan, searches through all tag channels in sequence. However, unlike priority scan, channel 16 is not checked unless channel 16 is set as a tag channel.
Setting tag channels

For more efficient scanning, add desired channels as tag channels or clear tag channels for unwanted channels. Channels set as non-tag channels will be skipped during scanning. Tag channels can be assigned to each channel group (USA, CAN, INT) independently.

1. Select the desired channel group (USA, CAN, INT) by pushing [CH/WX • U/I/C] for 1 sec., if desired.
2. Select the desired channel to set as a tag channel.
3. Push [SCAN • TAG] for 1 sec. to set the displayed channel as a tag channel.
   - [TAG] appears in the function display.
4. To cancel the tag channel setting, push [SCAN • TAG] for 1 sec.
   - [TAG] disappears.

- Clearing all tag channels in the selected channel group
While pushing [SCAN • TAG], turn the power ON to clear all tag channels in the channel group.

Starting a scan

Set scan type, weather alert function and scan resume timer in advance using SET mode. (p. 13)

1. Select the desired channel group (USA, CAN, INT) by pushing [CH/WX • U/I/C] for 1 sec., if desired.
   - When the weather alert function is in use, select the desired weather channel with [CH/WX] and the channel selector.
2. Push [SCAN • TAG] to start priority or normal scan.
   - "SCAN" appears and flashes in the function display.
   - "16" appears during priority scan.
   - When a signal is detected, scan pauses until the signal disappears or resumes after pausing 5 sec. according to SET mode setting. (Channel 16 is still monitored during priority scan.)
   - Push [▲]/[▼] to check tag channels, to change the scanning direction or resume the scan manually.
3. To stop the scan, push [SCAN • TAG].
   - "SCAN" disappears.
   - Pushing [PTT], [16 • 9], [CH/WX] or [DW • TRI] also stops the scan.

[Example]: Starting a normal scan.

Scan starts.
Scan pauses when receiving a signal and audio is emitted.
Push to stop the scan.
SET MODE

SET mode programming

SET mode is used to change the conditions of 6 transceiver functions: the beep tone function, the automatic backlighting, weather alert function, normal/priority scan, scan resume timer and power save function.

1. Turn power OFF.
2. While pushing [SQL], turn power ON and continue pressing [SQL] until “bp” appears.
3. Release [SQL].
4. Push [SQL] to select the desired item, if necessary.
5. Push [▲]/[▼] to select the desired condition of the item.
6. To exit SET mode, turn the power OFF, then ON again.

SET mode items

◊ Beep tone “bp”
You can select silent operation by turning beep tones OFF or you can have confirmation beeps sound at the push of a switch by turning beep tones ON. The beep tone volume is linked with [OFF/VOL].

◊ Automatic backlighting “bl”
This function is convenient for nighttime operation. The automatic backlighting turns the backlighting ON when pushing any key except for [PTT].
- The backlighting is automatically turned OFF after 5 sec. of inactivity.
◊ **Weather alert function** “AL”
NOAA broadcast stations transmit weather alert tones before important weather announcements. When the weather alert function is turned ON, the transceiver detects the alert, then flashes the “ALT” indicator until the transceiver is operated. The previously selected (used) weather channel is checked periodically during standby or while scanning.
*"ALT" appears when the function is set ON.*

◊ **Scan type selection** “SC”
The transceiver has 2 scan types: normal scan and priority scan. Normal scan searches all tag channels in the selected channel group. Priority scan searches all tag channels in sequence while monitoring channel 16.

◊ **Scan resume timer** “St”
The scan resume timer can be selected as a pause (OFF) or timer scan (ON). When OFF is selected, the scan pauses until a received signal disappears. When ON is selected, the scan pauses for 5 sec. after receiving a signal and then resumes even if the signal is still being received.

◊ **Auto power save function** “PS”
The power save function reduces current drain by deactivating the receiver circuit for preset intervals.
Installing batteries in the battery case

When using a battery case attached to the transceiver, install 6 AA(R6) size Ni-Cd or alkaline batteries as illustrated below.

1. Remove the battery case from the transceiver.
2. Install 6 × AA(R6) size Ni-Cd or alkaline batteries.
   - Be sure to observe the correct polarity.

CAUTION:
- When installing batteries, make sure they are all the same brand, type and capacity. Also, do not mix new and old batteries together.
- Keep battery contacts clean. It's a good idea to clean battery terminals once a week.

Battery charging

Prior to using the transceiver for the first time, the Ni-Cd batteries must be fully charged for optimum life and operation.

CAUTION: To avoid damage to the transceiver, turn it OFF while charging.

- Recommended temperature range for charging: +50°F to +104°F (+10°C to +40°C)
- Use the supplied AC adapter (BC-131A) only. NEVER use other adapters.
- An optional cable OPC-254L (for 12 V power source) or CP-12L (for 12 V cigarette lighter socket) can be used instead of the supplied AC adapter.

Before connecting DC power, make sure the internal switch is set to the proper battery type—Ni-Cd or alkaline. NEVER connect DC power to the battery case when installing alkaline batteries. Such a connection will damage the transceiver.
Charging connections

- Install 6 AA(R6) size Ni-Cd batteries into the battery case.
- Turn the battery selector switch to the Ni-Cd position.
- Connect the AC adapter (BC-131A) or optional cable (CP-12L or OPC-254L) as shown below.
  - The charge indicator lights red.
- Charge the Ni-Cd batteries for 15 hours.

Battery cautions

- **NEVER** incinerate used Ni-Cd batteries. Internal battery gas may cause an explosion.

- **NEVER** immerse batteries in water. If the battery case becomes wet, be sure to wipe it dry BEFORE attaching it to the transceiver.

- **NEVER** short terminals of the battery case. Also, current may flow into nearby metal objects so be careful when placing battery cases in handbags, etc.

If your Ni-Cd batteries seem to have no capacity even after being charged, completely discharge them by leaving the power ON overnight. Then, fully charge the Ni-Cd batteries again. If the Ni-Cd batteries still do not retain a charge (or very little), new Ni-Cd batteries must be purchased.

Recycling information

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Call 1-800-8-BATTERY for battery recycling options in your area or contact your dealer.
SUPPLIED ACCESSORIES AND ATTACHMENT

diamond Supplied accessories
The following accessories are supplied:

1 Flexible antenna ........................................1
2 Belt clip .................................................1
3 Handstrap ................................................1
4 Battery case (BP-204) with 6 Ni-Cd (AA) batteries ...1
5 AC adapter (BC-131A) .................................1

diamond Flexible antenna
Connect the supplied flexible antenna to the antenna connector.

CAUTION: Transmitting without an antenna may damage the transceiver.

diamond Belt clip
To attach: Slide the belt clip into the plastic loop on the back of the battery case.
To remove: Push the top of the belt clip towards the transceiver and out at the same time, then push it downwards and free of the plastic loop.

diamond Handstrap
Slide the handstrap through the loop on the side of the transceiver as illustrated at right. Facilitates carrying.
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<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
<th>REF.</th>
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<td>No power comes ON.</td>
<td>• The battery is exhausted.</td>
<td>• Recharge the battery pack.</td>
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<tr>
<td></td>
<td>• Bad connection to the battery pack.</td>
<td>• Check the conection to the transceiver.</td>
<td>p. 3</td>
</tr>
<tr>
<td>No sound comes from the speaker.</td>
<td>• Squelch level is too deep.</td>
<td>• Set squelch to the threshold point.</td>
<td>p. 6</td>
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<tr>
<td></td>
<td>• Volume level is too low.</td>
<td>• Set [OFF/VOL] to a suitable level.</td>
<td>p. 7</td>
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<td>• Speaker has been exposed to water.</td>
<td>• Drain water from the speaker.</td>
<td>—</td>
</tr>
<tr>
<td>Transmitting is impossible, or high power cannot be selected.</td>
<td>• Some channels are for low power or receive only.</td>
<td>• Change channels.</td>
<td>pgs. 2,4</td>
</tr>
<tr>
<td></td>
<td>• The battery is exhausted.</td>
<td>• Recharge the battery pack.</td>
<td>p. 15</td>
</tr>
<tr>
<td></td>
<td>• The output power is set to low.</td>
<td>• Push [H/L] to select high power.</td>
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<tr>
<td>The display channel cannot be changed.</td>
<td>• Lock function is activated.</td>
<td>• Push [H/L • LOCK] for 1 sec. to cancel the function.</td>
<td>p. 2</td>
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<tr>
<td>Scan does not start.</td>
<td>• “TAG” channels are not programmed.</td>
<td>• Set the desired channels as “TAG” channels.</td>
<td>p. 11</td>
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<tr>
<td>No beeps sound.</td>
<td>• Beep tones are turned OFF.</td>
<td>• Turn the beep tones ON in SET mode.</td>
<td>p. 13</td>
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## CHANNEL LIST

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</table>

†Low power only. ††Receive only.

**NOTE:** Simplex channels 3, 21, 23, 61, 64, 81, 82 and 84 CANNOT be used by the general public in USA waters.
## Specifications

### GENERAL
- **Frequency coverage**
  - Transmit: 156–157.5 MHz
  - Receive: 156–163 MHz
- **Mode**: FM (16K0G3E)
- **Channel spacing**: 25 kHz
- **Current drain (at 7.2 V)**
  - TX High (5 W): 1.6A typical
  - Max. audio: 230 mA typical
  - Standby: 60 mA typical
  - Power saved: 20 mA typical
- **Frequency stability**: ±10 ppm (−20°C to +60°C)
- **Useable temperature range**: −20°C to +60°C; −4°F to +140°F
- **Dimensions** (Projections not included)
  - 58 (W) x 140.5(H) x 43.5(D) mm
  - 2.3 (W) x 5.5 (H) x 1.7 (D) in
- **Weight**: 410g (14.4 oz)

### TRANSMITTER
- **Output power (at 7.2 V)**: 5 W and 1 W
- **Modulation system**: Variable reactance phase modulation
- **Max. frequency deviation**: ±5.0 kHz
- **Spurious emissions**: Less than –65 dB

### RECEIVER
- **Receive system**: Double-conversion superheterodyne
- **Sensitivity (12 dB SINAD)**: 0.25 µV typical
- **Squelch sensitivity**
  - Threshold: Less than 0.35 µV
  - Tight: Less than 2.00 µV
- **Intermodulation rejection ratio**: 70 dB typical
- **Spurious response rejection ratio**: 70 dB typical
- **Adjacent channel selectivity**: 70 dB typical
- **Audio output power**: 500 mW at 10% distortion with an 8 Ω load

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

## Options

- **CP-12L CIGARETTE LIGHTER CABLE WITH NOISE FILTER**
  Connects to a ship’s or vehicle’s cigarette lighter socket (12V).
- **OPC-254L DC POWER CABLE**
  Used for charging with an external power supply.
- **BP-204 BATTERY CASE**
  Battery case for R6(AA) x 6 alkaline or Ni-Cd cells.
- **BC-110D/V AC ADAPTER**
  Regularly charge battery packs attached to the transceiver in 15 to 20 hrs. BC-110D for Europe (AC 230 V), BC-110V for Australia (AC 240 V).