iCOM

INSTRUCTION MANUAL

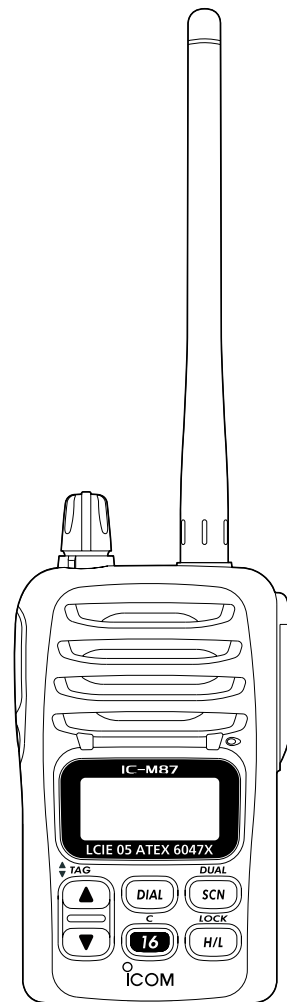VHF MARINE TRANSCEIVER

IC-M87

Ⅱ 2G Ex ib Ⅱ A T3 Gb
(Tamb=−20℃ to +55℃)

Icom Inc.

FOREWORD

Thank you for choosing this Icom product. This product is designed and built with Icom's state of the art technology and craftsmanship. With proper care this product should provide you with years of trouble-free operation.

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-M87.

EXPLICIT DEFINITIONS

WORD	DEFINITION
⚠DANGER!	Personal death, serious injury or an explosion may occur.
⚠WARNING!	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

FEATURES

☞ **22 free channels for PMR use**
The IC-M87 has 22 free channels reserved for PMR use (146–174MHz). Wide/narrow channel spacing is programmable for each channel, and CTCSS and DTCS signaling is included.
*Appropriate license will be required.

☞ **Tough waterproof construction**
The IC-M87 is built tough to withstand hazardous and unhospitable environments at sea and on land. Even if the IC-M87 is dropped into water, it's waterproofing* will protect it from harm. The compact and durable body meets the military specifications (MIL-STD).
* Equivalent to JIS waterproof grade 7 or IPX7 of the corresponding International Standard IEC 529 (1989). (1m depth for 30 minutes)

☞ **Simple operation**
6 clearly labelled buttons on the front panel and the volume/power knob maximize simplicity of operation. Even when wearing gloves, the large buttons are easy to operate. A large, clear LCD with backlighting and backlit buttons make night time operation simple.

IN CASE OF EMERGENCY

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

❍ *USING CHANNEL 16*

DISTRESS CALL PROCEDURE

1. "MAYDAY MAYDAY MAYDAY."

2. "THIS IS ...." (name of vessel)

3. Your call sign or other indication of the vessel.

4. "LOCATED AT ...." (your position)

5. The nature of the distress and assistance required.

6. Any other information which might facilitate the rescue.

RECOMMENDATION

CLEAN THE TRANSCEIVER THOROUGHLY WITH FRESH WATER after exposure to saltwater, and dry it before operating. Otherwise, the transceiver's keys, switches and controllers may become unusable, due to salt crystallization, and/or the charging terminals of the battery pack may rust.

NOTE: If the transceiver's waterproof protection appears defective, carefully clean it with a soft, wet (fresh water) cloth, then, dry it before operating.
The transceiver may lose its waterproof protection if the case, jack cap, or connector cover is cracked or broken, or the transceiver has been dropped.
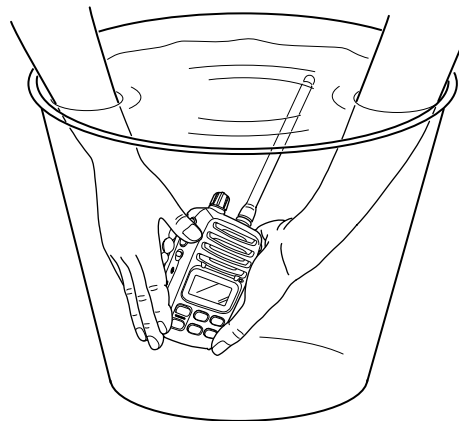
PRECAUTIONS

R**DANGER! NEVER** short terminals of the battery pack. Also, current may flow into nearby metal objects such as a key, so be careful when placing the battery packs (or the transceiver) in handbags, and so on. Simply carrying with or placing near metal objects such as a key, and so on may cause shorting. This may damage not only the battery pack, but also the transceiver.

R**DANGER!** Use and charge only specified Icom battery packs with Icom transceivers or Icom chargers. Only Icom battery packs are tested and approved for use with Icom transceivers or charged with Icom chargers. Using third-party or counterfeit battery packs or chargers may cause smoke, fire, or cause the battery to burst.

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

R**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.

CAUTION: NEVER connect the transceiver to a power source other than the BP-227AX. Such a connection will ruin the transceiver.

CAUTION: MAKE SURE the flexible antenna and battery pack are securely attached to the transceiver, and that the antenna and battery pack are dry before attachment. Exposing the inside of the transceiver to water will result in serious damage to the transceiver.
After exposure to water, clean the battery contacts thoroughly with fresh water and dry them completely to remove any water or salt residue.

DO NOT push [PTT] when you do not actually intend to transmit.

DO NOT operate or place the transceiver in direct sunlight or in areas with temperatures below –15°C or above +55°C: Marine, below –25°C or above +55°C: PMR.

DO NOT modify the transceiver. The specifications may change and then not comply with the requirements of a corresponded regulation. The transceiver warranty does not cover any problems caused by unauthorized modification.

DO NOT use harsh solvents such as benzine or alcohol when cleaning, as they will damage the transceiver surfaces.

KEEP the transceiver out of the reach of children.

KEEP the transceiver at least 0.9 meter away from your vessel's magnetic navigation compass.

BE CAREFUL! The transceiver meets IPX7* requirements for waterproof protection. However, once the transceiver has been dropped, waterproof protection cannot be guaranteed because of possible damage to the transceiver's case or the waterproof seal.
* Only when the BP-227AX, flexible antenna, [SP MIC] jack cover is attached.

BE CAREFUL! The transceiver will become hot when operating it continuously for long periods of time.

MAKE SURE to turn OFF the transceiver power before connecting or disconnecting the supplied or optional accessory.

INTRINSIC SAFETY

Versions of the IC-M87 which display the "EX" marking on the serial number seal.
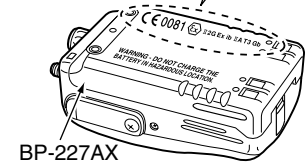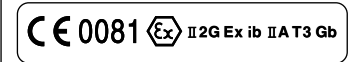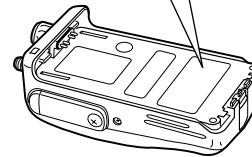The approval rating for these models is II 2G Ex ib II A T3 Gb.

WARNING! NEVER charge the BP-227AX (with/without the transceiver) in an explosive atmosphere. The optional battery chargers are not approved as Intrinsically Safe.

When the transceiver is used in a hazardous area, the BP-227AX **MUST** be attached, either the jack cover or HM-138 **MUST** be attached to the speaker-microphone connector.

KEEP the transceiver and the BP-227AX clean to avoid any risk of ignition due to the build-up of electrostatic charges.

Repair of Icom transceivers should only be carried out by authorized Icom distributors. In particular, repair of ATEX approved transceivers can **ONLY** be done by Icom to maintain the intrinsically safe rating. **NEVER** attempt to repair an ATEX approved transceivers. Only Icom has the repair expertise and procedures to maintain the ATEX approval. Contact your Icom distributor or authorised dealer for details.

The ATEX standard is described on the sticker (Ex Marking) and BP-227AX as below.

CE 0081 ⟨Ex⟩
II 2G Ex ib II A T3 Gb
Certification No. LCIE 05 ATEX 6047X
MFG DATE:
Address: 1-1-32, Kamiminami, Hirano-ku, Osaka, Japan

CE 0081 ⟨Ex⟩ II 2G Ex ib II A T3 Gb

BP-227AX

• **DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.**
• **DO NOT CHARGE THE BATTERY IN HAZARDOUS LOCATION.**

The equipment can be used without the microphone but with the jack cover.

DISPOSAL

The crossed-out wheeled-bin symbol on your product, literature, or packaging reminds you that in the European Union, all electrical and electronic products, batteries, and accumulators (rechargeable batteries) must be taken to designated collection locations at the end of their working life. Do not dispose of these products as unsorted municipal waste. Dispose of them according to the laws in your area.

COUNTRY CODE LIST

- **ISO 3166-1**

	Country	Codes			Country	Codes
1	Austria	AT		18	Liechtenstein	LI
2	Belgium	BE		19	Lithuania	LT
3	Bulgaria	BG		20	Luxembourg	LU
4	Croatia	HR		21	Malta	MT
5	Czech Republic	CZ		22	Netherlands	NL
6	Cyprus	CY		23	Norway	NO
7	Denmark	DK		24	Poland	PL
8	Estonia	EE		25	Portugal	PT
9	Finland	FI		26	Romania	RO
10	France	FR		27	Slovakia	SK
11	Germany	DE		28	Slovenia	SI
12	Greece	GR		29	Spain	ES
13	Hungary	HU		30	Sweden	SE
14	Iceland	IS		31	Switzerland	CH
15	Ireland	IE		32	Turkey	TR
16	Italy	IT		33	United Kingdom	GB
17	Latvia	LV				

TABLE OF CONTENTS

◇ 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

(1) 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.

(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 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.

◊ **Supplied accessories**
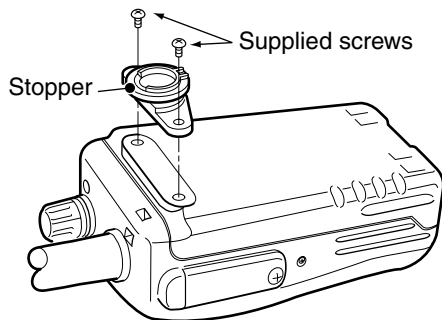
The following accessories are supplied: Qty.
• Swivel belt clip 1
• Stopper for the swivel belt clip 1
• Screws for the swivel belt clip. 2
• Flexible antenna 1
• Handstrap. 1
• Battery pack 1
• Power adapter*. 1
• Battery charger. 1
*Not supplied with some version

◊ **Swivel belt clip**

To attach:

① Attach the stopper to the back of the transceiver.

Supplied screws

Stopper

② Clip the belt clip to a part of your belt and insert the stopper to the belt clip.
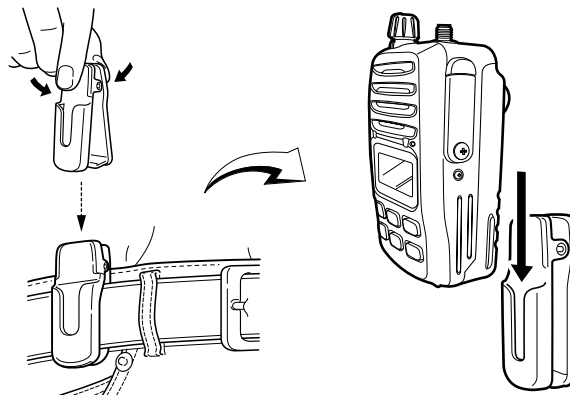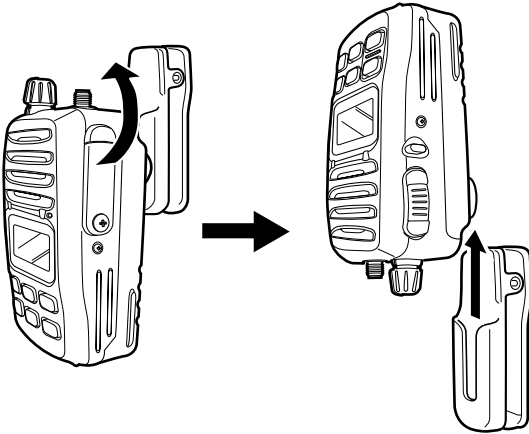
③ Once the transceiver is locked in place, it will swivel 360 degrees.
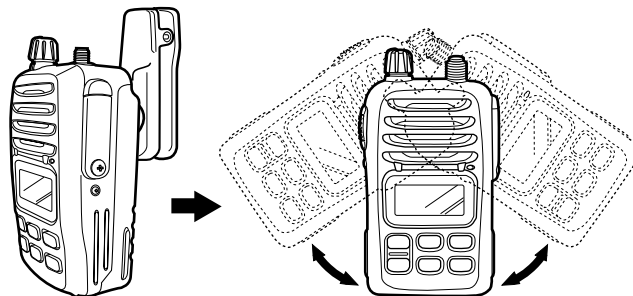
To remove:
Turn the transceiver upside down, and then lift up to release the transceiver from the belt clip.

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

CAUTION:
- **NEVER** carry the transceiver by holding the antenna.
- **DO NOT** connect the antenna other than listed on page 32.
- Transmitting without an antenna may damage the transceiver.

◇ Handstrap
Pass the handstrap through the loop on the back side of the transceiver as illustrated at right. This facilitates carrying.

CAUTION:
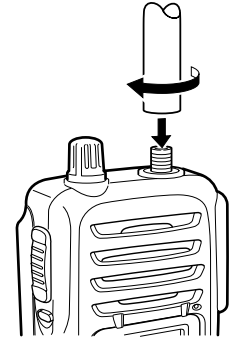**HOLD THE TRANSCEIVER TIGHTLY, WHEN ATTACHING OR REMOVING THE TRANSCEIVER FROM THE BELT CLIP.**
If the transceiver is accidentally dropped and the swivel belt clip's stopper is scratched or damaged, the swivel belt clip may not work properly.

3 PANEL DESCRIPTION
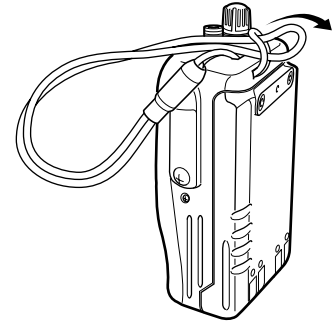
■ Front, top and side panels
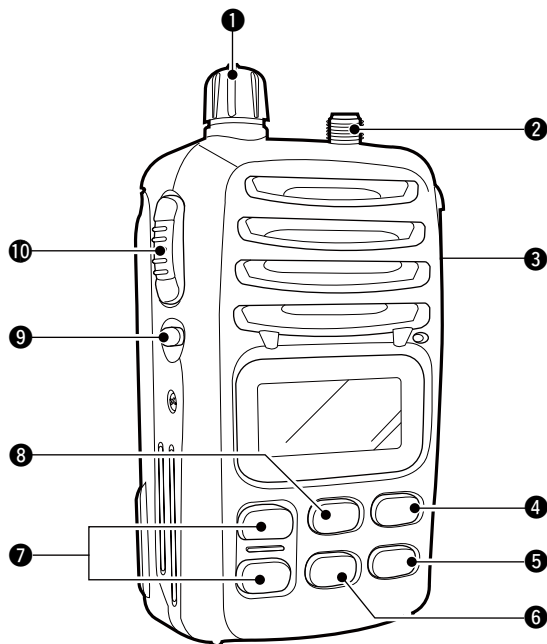
q **VOLUME CONTROL [VOL]**
Turns power ON and adjusts the audio level.

w **ANTENNA CONNECTOR** (p. 3)
Connects the supplied antenna.

e **SPEAKER-MICROPHONE CONNECTOR [SP MIC]** (p. 28)
Connects the optional speaker-microphone.
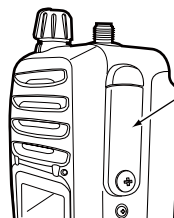
[SP MIC] jack cover

NOTE: KEEP the [SP MIC] jack cover attached to the transceiver when the speaker-microphone is not in use.

r **SCAN [SCN•DUAL]**
• Starts or cancels the Normal or Priority scan. (p. 14)
• Enters watch mode when held down for 1 second. (p. 15)

t **TRANSMIT POWER/LOCK SWITCH [H/L•LOCK]**
• Selects high, middle (except for the German version) or low power when pushed. (p. 10)
• Toggles the Lock function ON/OFF when held down for 1 second. (p. 11)

y **CHANNEL 16 SWITCH [16•C]**
• Selects Channel 16 when pushed. (p. 8)
• Selects the Call channel when held down for 1 second. (p. 8)
• Enters the Call channel programming mode when the Call channel is selected and this switch is held down for 3 seconds. (p. 12)

❼ CHANNEL UP/DOWN SWITCHES [▲]/[▼]
- Select an operating channel. (p. 8)
- Selects the Set mode condition of item. (p. 17)
- Checks TAG channels or changes scanning direction during scan. (p. 14)
- Sets and clears the displayed channel as a TAG (scanned) channel when held down both switches for 1 second.
- While turning power ON, clears all TAG channels in the selected channel group when both switches are pushed.

❽ DIAL/CHANNEL GROUP SWITCH [DIAL]
- Selects one of 3 regular channels in sequence when held down for 1 second. (pp. 9, 16)
  - International, USA (or ATIS*) and LAND (PMR) channels are available. *German version only
- Push to return to the condition before selecting the channel when the priority channel or the Call channel is selected.

❾ SQUELCH SWITCH [SQL] (p. 11)
- Push this switch, then set the squelch level with [▲]/[▼].
- Manually opens the squelch for channel monitoring while holding down.
- While holding down this switch, turn ON the transceiver to enter the Set mode.

❿ PTT SWITCH [PTT]
Hold down to transmit, release to receive.

◇ BATTERY PACK RELEASE BUTTON
To release the battery pack:
Push the battery release button in the direction of the arrow (❶) as shown below. The battery pack is then released.

To attach the battery pack:
Slide the battery pack on the back of the transceiver in the direction of the arrow (❷), then lock it with the battery release button.
*Slide the battery pack until the battery release button makes a 'click' sound.

Battery pack

Battery release button
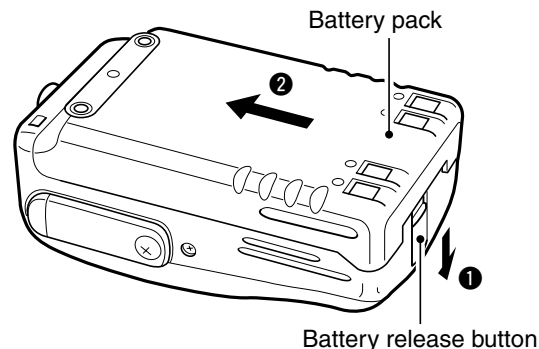
CAUTION: When pushing the battery release button, slide the battery pack slightly in the direction of the arrow (❷) to ease release. This will prevent possible injuring to your fingers or nails

■ **Function display**
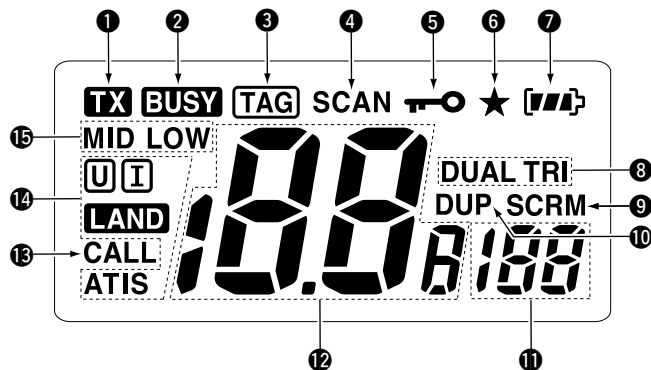
❶ TRANSMIT ICON (p. 10)
Displayed while transmitting.

❷ BUSY ICON (p. 10)
• Displayed when receiving a signal or when the squelch opens.
• Blinks while monitoring.

❸ TAG CHANNEL ICON (p. 14)
Displayed when a TAG channel is selected.

❹ SCAN INDICATOR (p. 14)
Blinks while scanning.

❺ LOCK ICON (p. 11)
Displayed while the lock function is activated.

❻ NARROW ICON (p. 16)
Displayed when narrow channel spacing is selected.
*LAND (PMR) channel group only.

❼ BATTERY INDICATOR
Displays the remaining battery power.

Indication	⟦▊▊◗	⟦▊ ⟧	⟦▊ ⟧	⟦ ⟧
Battery level	Full	Middle	Charging required	Discharged

⟦▊▊◗ blinks when the battery is over charged.

6

⓭DUALWATCH/TRI-WATCH INDICATORS (p. 15)
- "DUAL" is displayed during Dualwatch.
- "TRI" is displayed during Tri-watch.

⓭SCRAMBLER INDICATOR
Displayed when the optional voice scrambler is activated. (pp. 12, 21)

⓭DUPLEX INDICATOR
Displayed when a duplex channel is selected.

⓭SUB CHANNEL READOUT
- Displays Channel 16 during priority scan, Dualwatch or Tri-watch. (p. 15)
- Displays the Set mode item while in the Set mode.

⓭CHANNEL NUMBER READOUT
- Displays the selected operating channel number.
- Displays the selected condition while in the Set mode.

⓭CALL CHANNEL INDICATOR (p. 8)
Displayed when the Call channel is selected.

⓭CHANNEL GROUP ICONS (pp. 9, 16)
- "Ⓘ" is displayed when International channel group is selected.
- "Ⓤ" is displayed when USA channel group is selected (UK version only).
- "𝐋𝐀𝐍𝐃" is displayed when LAND (PMR) channel group is selected.
- "ATIS" is displayed when the channel group in which ATIS function is activated. (German version only)

⓭TRANSMIT POWER INDICATORS (p. 10)
- "LOW" is displayed when low power is selected.
- "MID" is displayed when middle power is selected. (Except for the German version)
- No indicator is displayed when high power is selected.

BASIC OPERATION

■ Channel selection

IMPORTANT: Prior to using the transceiver for the first time, the battery pack must be fully charged for optimum life and operation. To avoid damage to the transceiver, turn the power OFF while charging.

◇ Channel 16

Channel 16 (Distress channel) is used for establishing initial contact with another station and for emergency communications. Channel 16 is automatically monitored during both Dualwatch and Tri-watch. While standing by, you must monitor Channel 16.

q Push [16•C] to select Channel 16.
w Push [DIAL] to return to the condition before selecting Channel 16, or push [▲] or [▼] to select the operating channel.

Push [16] c

◇ Call channel

Each regular channel group has a separate Call channel. In addition, each Call channel is monitored during Tri-watch. The Call channels can be reprogrammed and are used to store your most often used channels in each channel group for quick recall.

q Hold down [16•C] for 1 second to select the Call channel in the selected channel group.
 • "CALL" and the Call channel number are displayed.
 • Each channel group may have its own Call channel after programming a Call channel. See the "Call channel programming" on page 12 for details.
w Push [DIAL] to return to the condition before selecting the Call channel, or push [▲] or [▼] to select the operating channel.

Push [16] c
for 1 second
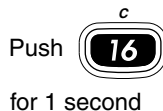
Channel 16 is the default setting.
(depending on version)

◇ International, USA and ATIS* channels

There are 57 International, 58 USA and 57 ATIS* channels. These channel groups may be specified for the operating area.

① Push [DIAL] to select a regular channel.
② Push [▲] or [▼] to select a channel.
  • "DUP" is displayed for duplex channels.
③ To change the channel group, hold down [DIAL] for 1 second.
  • International, USA and ATIS* channels can be selected in sequence. Depending on the setting, LAND (PMR) channel can be selected. See the "LAND (PMR) CHANNEL OPERATION" on page 16 for details.

* German version only

Hold down

DIAL

for 1 second

International channels

Hold down

DIAL

for 1 second

USA channels

ATIS channels*
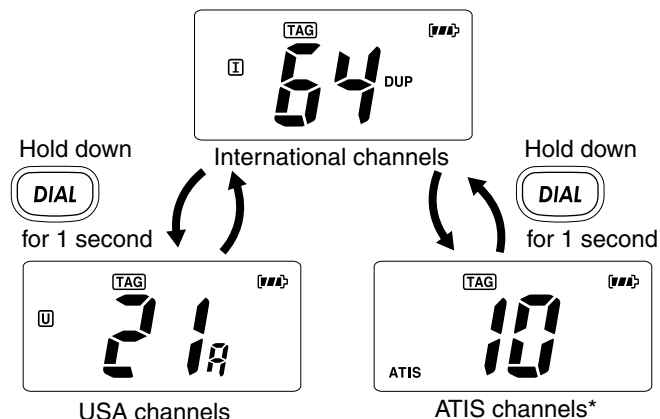
■ Receiving and transmitting

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

① Rotate [VOL] clockwise to turn ON the transceiver.
② Push [SQL] to enter the squelch adjustment mode, then push [▲] or [▼] to set the squelch level.
③ Hold down [SQL] for 1 second to open the squelch, then rotate [VOL] to set the volume level while holding down the [SQL] key. (See the Set mode item "Monitor switch action" on page 19.)
④ Push [▲] or [▼] to select the desired channel.
   - When receiving a signal, "🅱🆄🆂🆈" is displayed, and audio is emitted from the speaker.
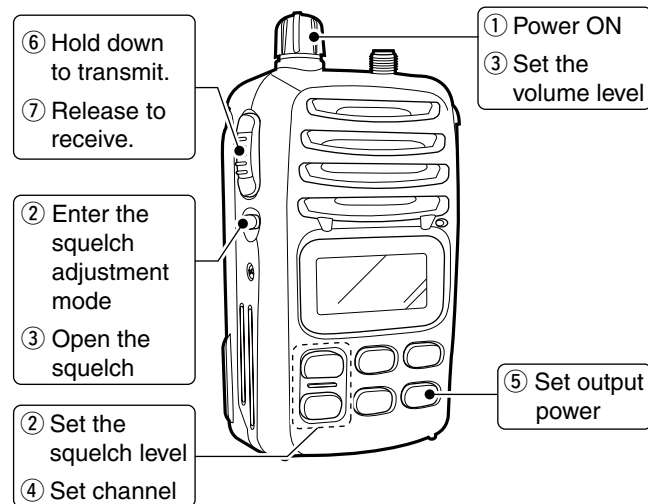   - Further adjustment of [VOL] may be necessary at this point.
⑤ Push [H/L•LOCK] to select the output power if necessary.
   - "LOW" is displayed when low power is selected.
     "MID" is displayed when middle power is selected (except for the German version).
     No indication when high power is selected.
   - Choose low power for short range communications, choose high power for longer distance communications.
   - Some channels are for low power only.
⑥ Hold down [PTT] to transmit, then speak into the microphone.
   - "TX" is displayed.
   - Channel 70 cannot be used for transmission (for GMDSS use).
⑦ Release [PTT] to receive.

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

⚡ **NOTE:** The transceiver has a power save function to conserve the battery power and it cannot be turned OFF. The power save function automatically activates when no signal is received for 5 seconds.

⑥ Hold down to transmit.
⑦ Release to receive.

② Enter the squelch adjustment mode
③ Open the squelch

② Set the squelch level
④ Set channel

① Power ON
③ Set the volume level

⑤ Set output power

■ Adjusting the squelch level

The IC-M87 has a squelch even though there is no control knob for it. In order to receive signals properly, as well as for the scan to function effectively, the squelch must be adjusted to the proper level.

① Push [SQL] to enter the Squelch Adjustment mode, then adjust the squelch level with [▲] or [▼].
  - "SL" is displayed.
  - There are 11 squelch levels to choose from: OP is completely open, 10 is the tight squelch level.
  - After 5 seconds of inactivity, the transceiver returns to normal condition.
② Push [SQL] again to return to normal condition.
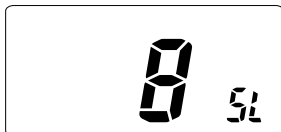
■ Automatic backlighting

This function is convenient for nighttime operation. The automatic backlighting can be turned ON in the Set mode. (p. 19)
➡ Push any key except for [PTT] to turn ON the LCD backlight.
  • The LCD backlight is automatically turned OFF after 5 seconds of inactivity.

■ Lock function

This function electronically locks all keys (except for [PTT], [SQL] and [H/L•LOCK]) to prevent accidental channel changes and function access.

➡ Hold down [H/L•LOCK] for 1 second to turn the Lock function ON or OFF.

Displayed while the Lock function is used.

■ Call channel programming

Call channel is used to access Channel 16 (default Call channel may differ, depending on the transceiver version), however, you can program the Call channel with your most often-used channels in each channel group for quick recall.

① Hold down [DIAL] for 1 second one or more times until the desired channel group (USA, International and ATIS) to be programmed is selected.

② Hold down [16•C] for 1 second to select the Call channel.
   • "CALL" and Call channel number are displayed.

③ Hold down [16•C] again for 3 seconds (until a long beep changes to 2 short beeps) to enter the Call channel programming mode.
   • Call channel number starts blinking.

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

⑤ Push [16•C] to program the displayed channel as the Call channel.
   • Call channel number stops blinking.
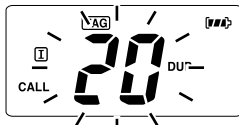
■ Voice scrambler operation

◇ Activating the scrambler
The optional Voice Scrambler provides private communications. In order to receive or send scrambled transmissions, you must first activate the Scrambler function.

① Select an operating channel except Channel 16 or 70.
② While holding down [SQL], push [SCN•DUAL].
   • "SCRM" is displayed.
③ To turn OFF the Scrambler function, repeat step ②.
   • "SCRM" disappears.

Appears when the voice scrambler function is in use.

◇ Programming scramble codes
There are 32 codes (1 to 32) are usable for programming.
In order to understand each other, all transceivers in your group must have the same scramble code, as well as the same scrambler unit. See page 21 for scrambler code setting details.

■ Scan types

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

In addition, the Auto Scan function is available for standby convenience. (p. 18)

Set the TAG channels (scanned channel) before scanning. Clear the TAG for unwanted channels which inconveniently stop scanning, such as those for digital communications.

⚡ Select the desired Scan type (Priority scan or Normal scan) in the Set mode. (p. 18)

PRIORITY SCAN
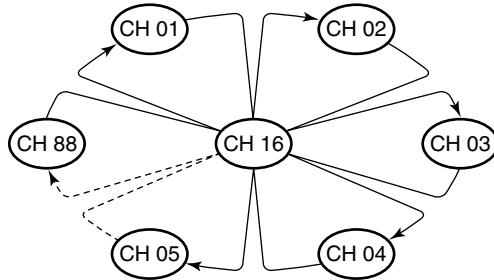
Priority scan searches through all TAG channels in sequence while monitoring Channel 16. When a signal is detected on Channel 16, scan pauses until the signal disappears. When a signal is detected on a channel other than Channel 16, scan becomes Dualwatch until the signal disappears.

NORMAL SCAN
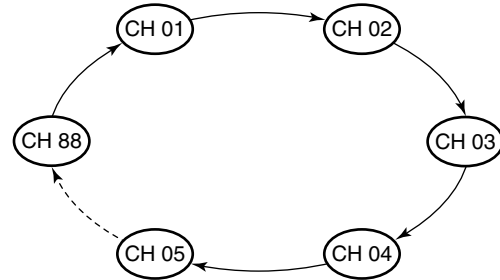
Normal scan, like Priority scan, searches through all TAG channels in sequence. However, unlike Priority scan, Channel 16 is not checked unless Channel 16 is set as a TAG channel.

■ Setting TAG channels

For more efficient scanning, add desired channels as TAG channels or clear TAG channels for unwanted channels.
Channels that are not tagged will be skipped during scanning. TAG channels can be assigned to each channel group (USA, International and ATIS) independently.

① Select the desired channel group by holding down [DIAL] for 1 second, if desired.
② Select the desired channel to set as a TAG channel.
③ Hold down both [▲] and [▼] for 1 second to set the displayed channel as a TAG channel.
  • "TAG" is displayed in the function display.
④ To cancel the TAG channel setting, hold down both [▲] and [▼] for 1 second.
  • "TAG" disappears.

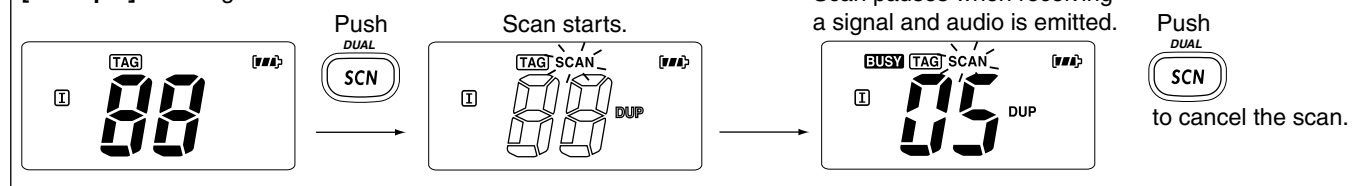**• Clearing all TAG channels in the selected channel group**
While holding down both [▲] and [▼], turn ON the transceiver to clear all TAG channels in the channel group.

■ Starting a scan

Set the Scan type, Scan Resume timer and Auto Scan function in advance, in the Set mode. (p. 18)

① Select the desired channel group by holding down [DIAL] for 1 second, if desired.
② Push [SCN•DUAL] to start Priority or Normal scan.
  • "SCAN" blinks in the function display.
  • "16" is displayed during Priority scan.
  • When a signal is received, scan pauses until the signal disappears or resumes after pausing 5 seconds according to Set mode setting. (Channel 16 is still monitored during priority scan.)
  • Push [▲] or [▼] to check the scanning TAG channels, change the scanning direction, or manually resume the scan.
③ To cancel the scan, push [SCN•DUAL].
  • "SCAN" disappears.
  • Pushing [PTT], [16•C] or [DIAL] also cancels the scan.

[Example]: Starting a normal scan.

Push
DUAL
(SCN)

Scan starts.

Scan pauses when receiving a signal and audio is emitted.

Push
DUAL
(SCN)
to cancel the scan.

■ Description

Dualwatch and Tri-watch is convenient to monitor Channel 16 while you are listening or talking on another channel.

Dualwatch monitors Channel 16 while listening or talking on another channel.

Tri-watch monitors Channel 16 and the Call channel while listening or talking on another channel.

DUALWATCH/TRI-WATCH SIMULATION

Call channel

Ch 16 → Ch 88   Ch 88   Ch 16   Ch 88   Ch 20
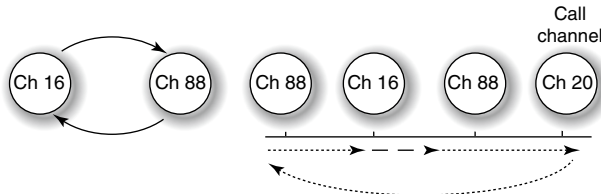
Dualwatch   **Tri-watch**

• 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, hold down [PTT].

■ Operation

① Select Dualwatch or Tri-watch in the Set mode. (p. 19)
② Select the desired operating channel.
③ Hold down [SCN•DUAL] for 1 second to start Dualwatch or Tri-watch (depending on the Set mode setting).
   • "DUAL" blinks during Dualwatch, "TRI" blinks during Tri-watch.
   • A beep tone sounds when a signal is received on Channel 16.
   • Tri-watch becomes Dualwatch when receiving a signal on the Call channel.
④ To cancel Dualwatch/Tri-watch, push [SCN•DUAL] again.

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

Hold down

DUAL
SCN

for 1 second

Tri-watch starts.

Signal is received on Call channel.

Signal received on Channel 16 takes priority.

Tri-watch resumes after the signal disappears.

15

7 LAND (PMR) CHANNEL OPERATION

■ LAND (PMR) Channel group

A maximum of 22 free LAND mobile channels (allocated 146.000 to 174.000 MHz) can be programmed into the LAND channel group for simple communication with PMR transceivers in the VHF band.

Moreover, any of the marine channels in the INT and USA channel groups can be programmed.

The default setting of the LAND channel group is the same as that of the INT channel group. Ask your local Icom dealer for the LAND channel group setting and PMR frequency programming details.

① Push [DIAL] to select a regular channel.
② Hold down [DIAL] for 1 second one or more times until the LAND (PMR) channel group is selected.
   • "LAND" is displayed when LAND (PMR) channel group is selected.
③ Push [▲] or [▼] to select a channel.
   • "DUP" is displayed for duplex channels.
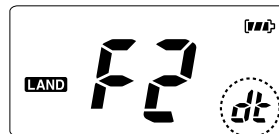
Push (DIAL)

NOTE: The basic settings (Example: Call channel programming) are same as the International and USA channels. Refer to the appropriate pages for details.

■ Function display

When Narrow, DTCS or CTCSS is set, the display shows the indications as below.

Displayed when Narrow channel spacing is set.

Displayed when DTCS is set.
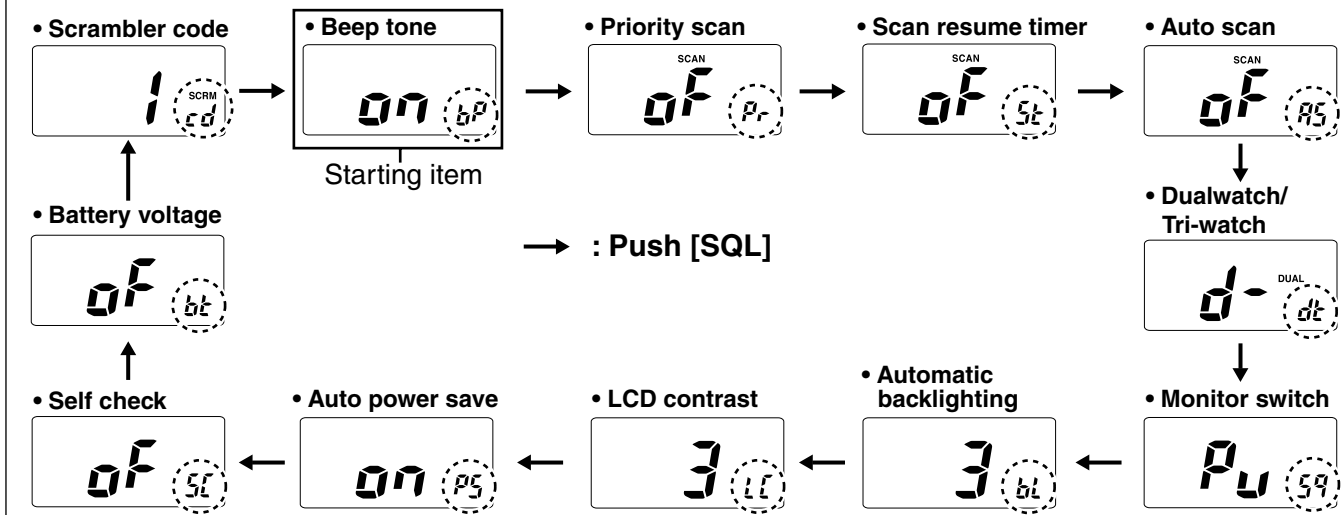
Displayed when CTCSS set.

■ Set mode programming

Set mode is used to change the condition of 12 transceiver functions: Beep tone function, Priority scan function, Scan resume timer, Auto scan function, Dualwatch/Tri-watch function, Monitor switch action, Automatic backlighting, LCD contrast selection, Auto power save function, Self check function, Battery voltage indicator, and Scrambler code.

◇ Set mode operation

① Turn OFF the transceiver.
② While holding down [SQL], turn ON the transceiver to enter the Set mode.
• "bp" is dispalyed.
③ Push [SQL] one or more times until the desired item is selected.
④ Push [▲] or [▼] to select the desired condition of the item.
⑤ To exit the Set mode, push [16•C].

• **SET MODE CONTENTS**   The displays show the default settings, and the item initial is displayed in the dotted circle.

• **Scrambler code**   • **Beep tone**   • **Priority scan**   • **Scan resume timer**   • **Auto scan**

Starting item

: Push [SQL]

• **Battery voltage**

• **Dualwatch/ Tri-watch**

• **Self check**   • **Auto power save**   • **LCD contrast**   • **Automatic backlighting**   • **Monitor switch**

■ Set mode items

◇ Beep tone function "bP"

You can select silent operation by turning OFF the beep tones, or you can have 2 types of confirmation beeps sound at the push of a switch. When ON is selected, a fixed beep (Pi) sounds and when US is selected, the preset beeps (e.g. do, re, mi) sound.
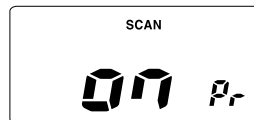
Beep tone ON (default)   User Beep

◇ Priority scan function "Pr"

The transceiver has 2 scan types—Normal and Priority scans. Normal scan searches all TAG channels in the selected channel group. Priority scan searches all TAG channels in sequence while monitoring Channel 16.

Normal scan (default)   Priority scan

◇ Scan resume timer "St"

The Scan resume timer can be set as a pause (OFF) or timer scan (ON).
- OFF : When a signal is detected on a channel, scan pauses on the channel until the signal disappears, and then resumes.
- ON : When a signal is detected on a channel, scan pauses on the channel for 5 seconds, and then resumes.

Scan resume timer OFF   Scan resume timer ON
(default)

◇ Auto scan function "AS"

The Auto scan function automatically starts the scan when no signal is received, or no operation is performed for 30 seconds.
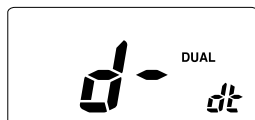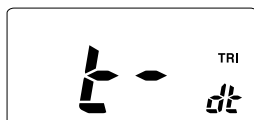
Auto scan OFF (default)   Auto scan ON

◇ **Dual/Tri-watch function** "dt"
This item selects Dualwatch or Tri-watch as desired. See page 15 for details.

Dualwatch function
(default)

PUSH

Tri-watch function

◇ **Monitor switch action** "Sq"
The monitor switch action temporarily cuts off the squelch function. This switch action contains PUSH (Pu) or HOLD (Ho) settings as shown below.
• Pu (PUSH) : The Monitor function is activated by holding down [SQL] for 1 second. The squelch opens while holding down the key.
• Ho (HOLD) : The Monitor function is activated by holding down [SQL] for 1 second. The squelch stays open until any key is pushed.

Monitor action PUSH
(default)

PUSH

Monitor action Hold

◇ **Automatic backlighting** "bL"
This function is convenient for nighttime operation. The automatic backlighting can be adjusted from OFF, 1 (dark)–3 (bright), 3 (default). Select 1 to 3 to turn ON this function.
• The backlight is automatically turned ON when any key except for [PTT] is pushed.
• The backlight is automatically turned OFF after 5 seconds of inactivity.

Automatic backlighting
(default)
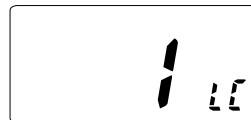
PUSH

Automatic backlighting
OFF

◇ **LCD contrast selection** "LC"
The contrast of the LCD can be adjusted from 4 levels.
• 1 (bright)–4 (dark), 3 (default)

LCD contrast 3 (default)

PUSH

LCD contrast 1

◇ Auto power save function "PS"

The Auto power save function reduces current drain by deactivating the receiver circuit for preset intervals.
• OFF : The power save function is turned OFF.
• ON : The power save function is turned ON. The power save function will be activated when no signal is received, and no operation is performed for 5 seconds.

PUSH

Auto power save ON (default)

Auto power save OFF

◇ Self check function "SC"

The Self check function checks transceiver conditions by itself, and informs you in case a problem is found. The following items are checked after the power is turned ON, then it switches to operation mode.
• Temperature : Outside of –35°C to +73°C (approximate)
• Connected battery voltage
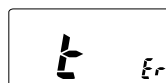• Water intrusion

PUSH

Self check OFF (default)
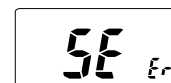
Self check ON

When error messages as shown below are displayed, see trouble shooting for advice (p. 29).

Temperature error   Battery voltage error   Water intrusion error

◇ **Battery voltage indicator** "bt"

This function contains display or non-display settings of the voltage of the connected battery pack when the power is ON.

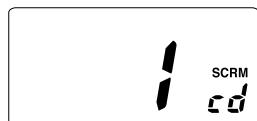• The voltage of the connected battery pack is displayed for 2 seconds after power is turned ON.

Battery voltage OFF (default)　　PUSH　　Battery voltage ON

◇ **Scrambler code** "cd"

There are 32 codes (1 to 32) available for programming. In order to understand each other, all transceivers in your group must have the same scramble code.

Scrambler code 1 (default)　　PUSH　　Scrambler code 32

SET MODE LIST

Function	Indication	Switch
Beep tone function	"bP"	OFF / ON* / US
Priority scan function	"Pr"	OFF* / ON
Scan resume timer	"St"	OFF* / ON
Auto scan function	"AS"	OFF* / ON
Dual/Tri-watch function	"dt"	Dual* / Tri
Monitor switch action	"Sq"	Push* / Hold
Automatic backlighting	"bL"	OFF / 1 / 2 / 3*
LCD contrast selection	"LC"	1 / 2 / 3* / 4
Auto power save function	"PS"	OFF / ON*
Self check function	"SC"	OFF* / ON
Battery voltage indicator	"bt"	OFF* / ON
Scrambler code	"cd"	1* / 2 /⋯/ 32

* default setting

21

BATTERY CHARGING

■ Caution

• Misuse of Lithium-ion batteries may result in the following hazards: smoke, fire, or the battery may rupture. Misuse can also cause damage to the battery or degradation of battery performance.
• Prior to using the battery pack for the first time, or after not using it for a long time, you must fully charge the pack. Otherwise, the transceiver may not turn ON.

⚠ **WARNING! NEVER** charge the battery (with/without the transceiver) in an explosive atmosphere. The optional battery chargers are not approved as Intrinsically Safe.

◇ Battery caution

⚠ **DANGER! DO NOT** hammer or otherwise impact the battery. Do not use the battery if it has been severely impacted or dropped, or if the battery has been subjected to heavy pressure. Battery damage may not be visible on the outside of the case. Even if the surface of the battery does not show cracks or any other damage, the cells inside the battery may rupture or catch fire.

⚠ **DANGER! NEVER** use the transceiver or the battery if either one is damaged, shows cracks, bruises or is deformed.

⚠ **DANGER! NEVER** use or leave battery packs in areas with temperatures above +60˚C. High temperature buildup in the battery, such as could occur near fires or stoves, inside a sun heated car, or in direct sunlight for long periods of time may cause the battery to rupture or catch fire. Excessive temperatures may also degrade battery performance or shorten battery life.

⚠ **DANGER! DO NOT** expose the battery to rain, snow, seawater, or any other liquids. Do not charge or use a wet battery. If the battery gets wet, be sure to wipe it dry before using. The battery is not waterproof.

⚠ **DANGER! KEEP** battery packs away from fire. Fire or heat may cause them to rupture or explode. Dispose of an used battery pack in accordance with local regulations.

⚠ **DANGER! NEVER** solder the battery terminals or NEVER modify the battery pack. This may generate heat in the battery, and the battery pack may burst, emit smoke or catch fire.

⚠ **DANGER!** Use the battery only with the transceiver for which it is specified. Never use a battery with any other equipment, or for any purpose that is not specified in this instruction manual.

⚠ **DANGER!** If fluid from inside the battery gets in your eyes, blindness can result. Rinse your eyes with clean water, without rubbing them, and see a doctor immediately.

⚠ **WARNING!** Immediately stop using the battery if it emits an abnormal odor, heats up, or is discolored or deformed. If any of these conditions occur, contact your Icom dealer or distributor.

⚠ **WARNING!** Immediately wash, using clean water, any part of the body that comes into contact with fluid from inside the battery.

⚠ **WARNING! NEVER** put the battery in a microwave oven, high-pressure container, or in an induction heating cooker. This could cause a fire, overheating, or cause the battery to rupture.

CAUTION: Always use the battery within the specified temperature range for the transceiver (−15˚C to +55˚C: Marine, −25˚C to +55˚C: PMR) and the battery itself (−10˚C to +60˚C). Using the battery out of its specified temperature range will reduce the battery's performance and battery life. Please note that the specified temperature range of the battery may exceed that of the transceiver. In such cases, the transceiver may not work properly because it is out of its operating temperature range.

CAUTION: Shorter battery life could occur if the battery is left fully charged, completely discharged, or in an excessive temperature environment (above +45˚C) for an extended period of time. If the battery must be left unused for a long time, it must be detached from the transceiver after discharging. You may use the battery until the remaining capacity is about half, then keep it safely in a cool dry place with the temperature range as below:
   −20˚C to +45˚C (within a month)
   −20˚C to +40˚C (within six months)
   −20˚C to +35˚C (within a year)

BE SURE to replace the battery pack with a new one approximately five years after manufacturing, even if it still holds a charge. The inside battery material will become weak after a period of time, even with little use. The estimated number of times you can charge the battery is between 300 and 500. Even when the battery appears to be fully charged, the operating time of the transceiver may become short when:
• Approximately five years have passed since the battery was manufactured.
• The battery has been repeatedly charged.

■ Caution (Continued)
◇ **Charging caution**

⚠ **DANGER! NEVER** charge the battery pack in areas with extremely high temperatures, such as near fires or stoves, inside a sun heated car, or in direct sunlight. In such environments, the safety/protection circuit in the battery will activate, causing the battery to stop charging.

⚠ **WARNING! NEVER** charge the transceiver during a lightning storm. It may result in an electric shock, cause a fire or damage the transceiver. Always disconnect the power adapter before a storm.

⚠ **WARNING! DO NOT** charge or leave the battery in the battery charger beyond the specified time for charging. If the battery is not completely charged by the specified time, stop charging and remove the battery from the battery charger. Continuing to charge the battery beyond the specified time limit may cause a fire, overheating, or the battery may rupture.

⚠ **WARNING! NEVER** insert the transceiver (battery attached to the transceiver) into the charger if it is wet or soiled. This could corrode the battery charger terminals or damage the charger. The charger is not waterproof.

CAUTION: DO NOT charge the battery outside of the specified temperature range: BC-152N (0˚C to +45˚C). Icom recommends charging the battery at +20˚C. The battery may heat up or rupture if charged out of the specified temperature range. Additionally, battery performance or battery life may be reduced.

◇ Charging connections

① Attach the BC-152N to a flat surface, such as desk or cabin, if desired.

② Connect the power adapter as shown below.

③ Insert the battery pack with/without the transceiver into the charger.
  • The charge indicator lights orange while charging.

④ Charge the battery pack approximately 10 hours, depending on the remaining power condition.
  • The charge indicator lights green when charging is completed.

Turn power OFF

Transceiver

Battery pack

Charge indicator

Supplied screws

BC-152N

Power adapter
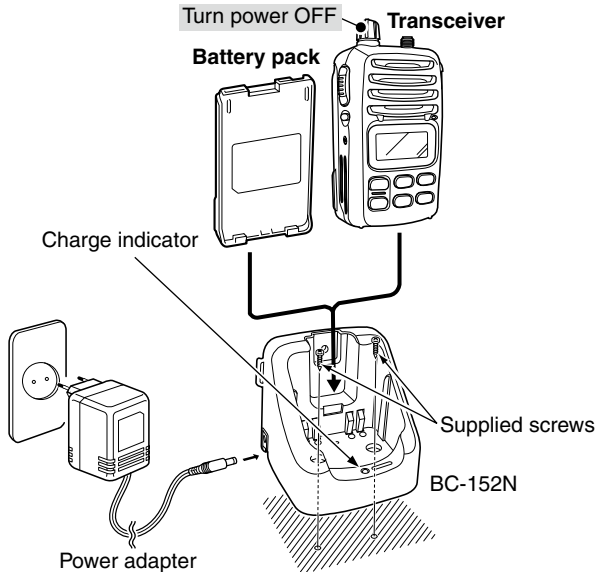
If the charge indicator blinks orange or green, or does not light when a problems is detected.

SOLUTIONS:
• Remove the battery pack, and reinsert it.
• Remove the battery pack, clean the battery terminals, then reinsert it.
• If the battery pack temperature is high, remove and let it cool down, then reinsert it.

If you are unable to solve the problem through the use of these solutions, the battery pack or the charger may be damaged, or the battery life may be over. In that case, contact your nearest Icom Dealer or Service Center.

NOTE:
After charging is completed, the BC-152N will automatically recharge the battery pack when the battery voltage decreases. If the battery pack is often left in the charger for long periods, the battery life cycle will be shorter.

◇ For your convenience

Eyelet
USE a rubber band to secure the transceiver while charging, if desired.
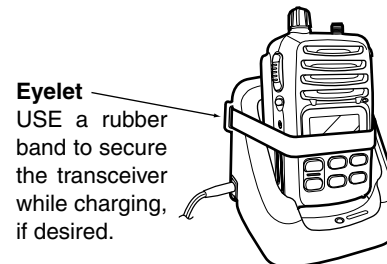
■ AD-100 installation

The AD-100 CHARGER ADAPTER must be installed into the BC-119N or BC-121N before battery charging.

①Connect the AD-100 CHARGER ADAPTER and the BC-119N or BC-121N.
②Install the AD-100 into the holder space of the BC-119N or BC-121N with the supplied screws.

AD-100
①
Plugs
Screws supplied with the charger adapter
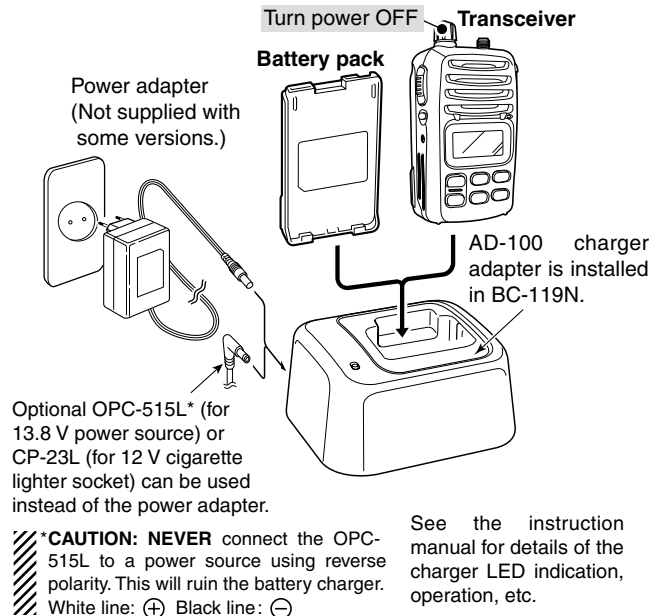②
Sockets
This illustration shows the BC-119N.
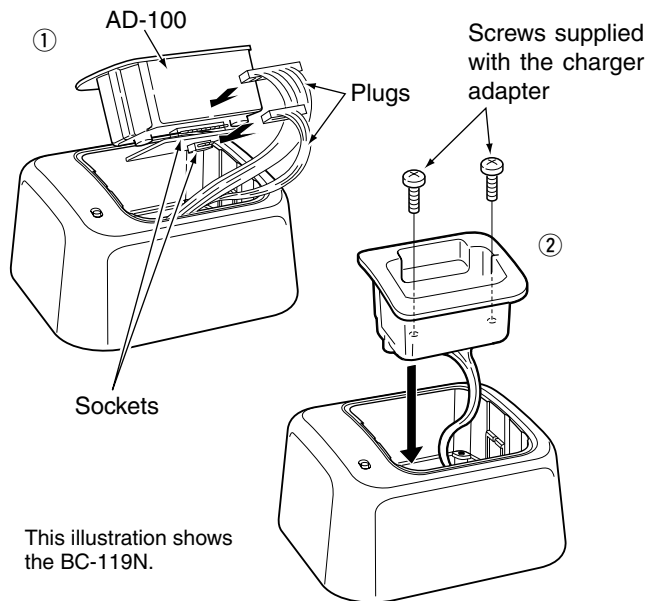
■ Optional battery chargers

◇ Rapid charging with the BC-119N+AD-100

The optional BC-119N provides rapid charging of the battery packs. The following are additionally required.
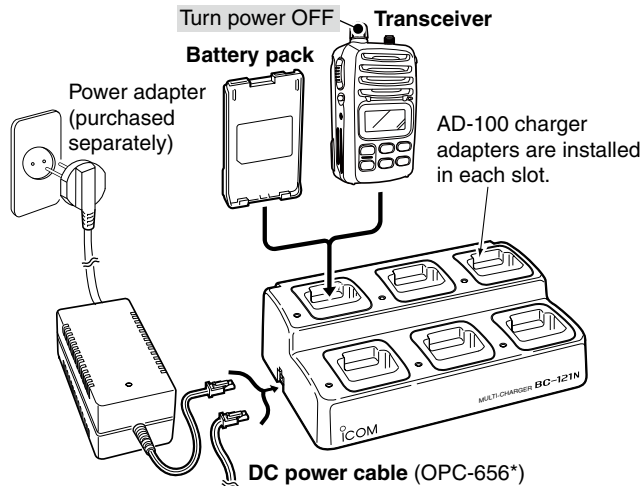• AD-100 charger adapter
• A power adapter (may be supplied with BC-119N depending on version).

Turn power OFF   Transceiver
Battery pack
Power adapter (Not supplied with some versions.)
AD-100 charger adapter is installed in BC-119N.

Optional OPC-515L* (for 13.8 V power source) or CP-23L (for 12 V cigarette lighter socket) can be used instead of the power adapter.

*CAUTION: NEVER connect the OPC-515L to a power source using reverse polarity. This will ruin the battery charger. White line: ⊕ Black line: ⊖

See the instruction manual for details of the charger LED indication, operation, etc.

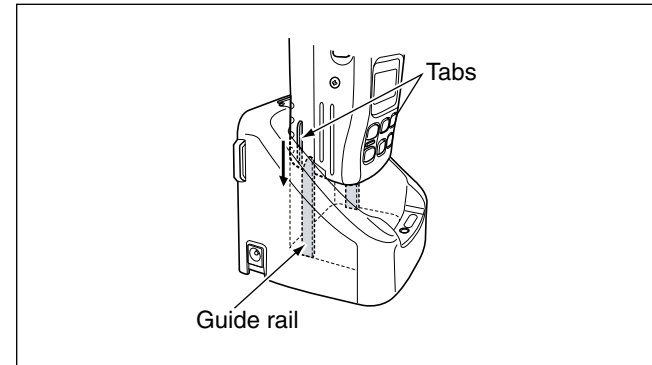◇ **Rapid charging with the BC-121N+AD-100**
The optional BC-121N allows up to 6 battery packs to be charged simultaneously. The following are additionally required.
• Six AD-100 charger adapters
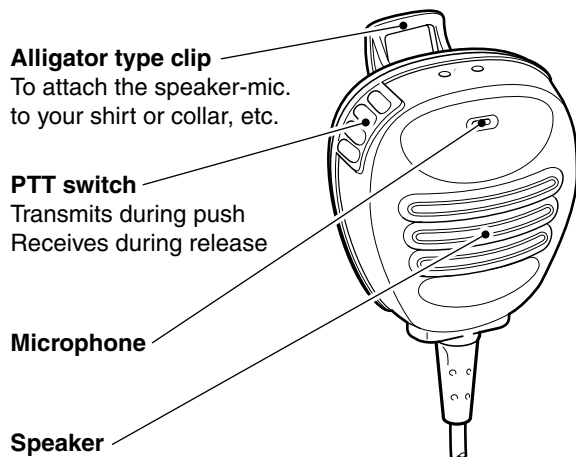• A power adapter (BC-157) or the DC power cable OPC-656, supplied with the BC-121N.

Turn power OFF   **Transceiver**
Battery pack
Power adapter (purchased separately)
AD-100 charger adapters are installed in each slot.

DC power cable (OPC-656*)
(Connect with a DC power supply; 13.8 V/at least 7 A)
*About the OPC-656
Red line : ⊕ Black line : ⊖

IMPORTANT: Battery charging caution
Ensure the guide tabs on the battery pack are correctly aligned with the guide rails inside the charger adapter. (This illustration is described with the BC-152N.)

Tabs
Guide rail

10 SPEAKER-MICROPHONE

■ HM-138 Description

Alligator type clip
To attach the speaker-mic.
to your shirt or collar, etc.

PTT switch
Transmits during push
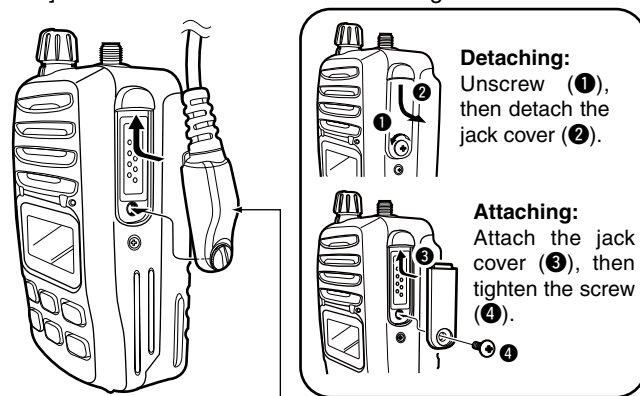Receives during release

Microphone

Speaker

NEVER immerse the connector in water. If the connector becomes wet, be sure to dry it BEFORE attaching it to the transceiver.

NOTE: The microphone is located at the top of the speaker-microphone, as shown in the diagram above. To maximize the readability of your transmitted signal (voice), hold the microphone approximately 5 to 10 cm from your mouth, and speak in a normal voice level.

■ Attachments

Insert the connector of the speaker-microphone into the [SP MIC] connector on the transceiver and tighten the screw.

Detaching:
Unscrew (❶), then detach the jack cover (❷).

Attaching:
Attach the jack cover (❸), then tighten the screw (❹).

CAUTION: Attach the speaker-microphone's connector securely to prevent accidental dropping, or water intrusion in the connector.

IMPORTANT: KEEP the [SP MIC] jack cover attached when the speaker-microphone is not in use. If the cover is not attached, water will get into the transceiver. Moreover, the terminals (pins) will become rusty, or the transceiver will function abnormally if the connector gets wet.

CAUTION: For ATEX compliance in hazardous areas, the jack cover just also be attached when the HM-138 is not being used.

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
The transceiver does not turn ON.	• The battery is exhausted. • Bad connection to the battery pack.	• Recharge the battery pack. • Check the connection to the transceiver.	p. 22 p. 5
No sound from speaker.	• Squelch level is too deep. • Volume level is too low. • Speaker has been exposed to water.	• Set squelch to the threshold point. • Set [VOL] to a suitable level. • Drain water from the speaker.	p. 11 p. 10 —
Transmitting is impossible, or high power can not be selected.	• Some channels are for low power or receive only. • The battery is exhausted. • The output power is set to low.	• Change channels. • Recharge the battery pack. • Push [H/L•LOCK] to select high power.	pp. 8, 9, 29 p. 22 p. 10
The displayed channel cannot be changed.	• Lock function is activated.	• Hold down [H/L•LOCK] for 1 second to cancel the function.	p. 11
Scan does not start.	• "TAG" channels are not programmed.	• Set the desired channels as "TAG" channels.	p. 14
No beeps.	• Beep tones are turned OFF.	• Set the beep tones to ON (Fix Beep/User Beep) in the Set mode.	p. 18
Self check error. (Temperature)	• The temperature is outside of −35°C to +73°C (approximate).	• Leave the transceiver at room temperature for a while. Turn the power ON to check if the internal temperature has returned to normal.	—
Self check error. (Battery voltage)	• The connected battery pack's voltage is more than 8.8 V.	• Verify the battery voltage is correct.	—
Self check error. (Water intrusion)	• Water has entered the transceiver.	• Have the transceiver checked at your local distributor or dealer to see whether the transceiver works properly or not.	—

VHF MARINE CHANNEL LIST

• International channels

CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)	
	Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive
01	156.050	160.650	11	156.550	156.550	21	157.050	161.650	61	156.075	160.675	71	156.575	156.575	81	157.075	161.675
02	156.100	160.700	12	156.600	156.600	22	157.100	161.700	62	156.125	160.725	72	156.625	156.625	82	157.125	161.725
03	156.150	160.750	13	156.650	156.650	23	157.150	161.750	63	156.175	160.775	73	156.675	156.675	83	157.175	161.775
04	156.200	160.800	14	156.700	156.700	24	157.200	161.800	64	156.225	160.825	74	156.725	156.725	84	157.225	161.825
05	156.250	160.850	15	156.750	156.750	25	157.250	161.850	65	156.275	160.875	75	156.775	156.775	85	157.275	161.875
06	156.300	156.300	16	156.800	156.800	26	157.300	161.900	66	156.325	160.925	76	156.825	156.825	86	157.325	161.925
07	156.350	160.950	17	156.850	156.850	27	157.350	161.950	67	156.375	156.375	77	156.875	156.875	87	157.375	157.375
08	156.400	156.400	18	156.900	161.500	28	157.400	162.000	68	156.425	156.425	78	156.925	161.525	88	157.425	157.425
09	156.450	156.450	19	156.950	161.550	37A*	157.850	157.850	69	156.475	156.475	79	156.975	161.575	P4	161.425	161.425
10	156.500	156.500	20	157.000	161.600	60	156.025	160.625	70†	156.525	156.525	80	157.025	161.625			

• USA channels (for U.K. version only)

CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)		CH	Frequency (MHz)	
	Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive		Transmit	Receive
01A	156.050	156.050	12	156.600	156.600	22A	157.100	157.100	64A	156.225	156.225	77	156.875	156.875	86	157.325	161.925
--	- - -	- - -	13	156.650	156.650	23A	157.150	157.150	65A	156.275	156.275	78A	156.925	156.925	86A	157.325	157.325
03A	156.150	156.150	14	156.700	156.700	24	157.200	161.800	66A	156.325	156.325	79A	156.975	156.975	87	157.375	161.975
--	- - -	- - -	15	156.750	156.750	25	157.250	161.850	67	156.375	156.375	80A	157.025	157.025	87A	157.375	157.375
05A	156.250	156.250	16	156.800	156.800	26	157.300	161.900	68	156.425	156.425	81A	157.075	157.075	88	157.425	162.025
06	156.300	156.300	17	156.850	156.850	27	157.350	161.950	69	156.475	156.475	82A	157.125	157.125	88A	157.425	157.425
07A	156.350	156.350	18A	156.900	156.900	28	157.400	162.000	70†	156.525	156.525	83A	157.175	157.175	P4*	161.425	161.425
08	156.400	156.400	19A	156.950	156.950	37A*	157.850	157.850	71	156.575	156.575	84	157.225	161.825			
09	156.450	156.450	20	157.000	161.600	61A	156.075	156.075	72	156.625	156.625	84A	157.225	157.225			
10	156.500	156.500	20A	157.000	157.000	--	- - -	- - -	73	156.675	156.675	85	157.275	161.875			
11	156.550	156.550	21A	157.050	157.050	63A	156.175	156.175	74	156.725	156.725	85A	157.275	157.275			

† Receive only

*UK Marina Channels: M1=37A (157.850 MHz), M2=P4 (161.425 MHz) for U.K. version only

GENERAL
- Frequency coverage

Marine	TX:	156.000–161.450 MHz
	RX:	156.000–163.425 MHz
PMR	TX/RX:	146.000–174.000 MHz

- Mode

Marine:	16K0G3E
PMR:	16K0F3E* (Wide)/8K50F3E (Narrow)
	*14K0F3E for German version

- Channel spacing

Marine:	±25 kHz
PMR:	±25 kHz (Wide)
	±20 kHz (Wide) <German ver.>
	±12.5 kHz (Narrow)
Current drain (at 7.4 V DC):	TX at 1 W 0.7 A typical
	TX at 0.5 W 0.6 A typical
	Max. audio 200 mA typical
	Power save 20 mA typical
Frequency stability:	±1.5 kHz (–25°C to +55°C)

- Usable temperature range

Marine:	–15°C to +55°C
PMR:	–25°C to +55°C
Dimensions:	62 (W) × 97(H) × 39(D) mm
	(Projections are not included)
Weight (with BP-227AX):	280 g (approximate)

TRANSMITTER
- Output power (at 7.4 V DC)

Marine:	1/0.5 W
PMR:	1 W ALL
Modulation system:	Variable reactance frequency modulation

- Max. frequency deviation

Marine:	±5 kHz (Wide)
PMR:	±5 kHz (Wide)
	±4 kHz (Wide) <German ver.>
	±2.5 kHz (Narrow)
Audio harmonics distortion:	Less than 10% (at 60% mod.)
Spurious emissions:	0.25 μW (below 2GHz)
	1 μW (above 2GHz)

RECEIVER

Receive system:	Double-conversion superheterodyne

- Sensitivity (20 dB SINAD)

Marine:	–2 dBμ EMF (typical)
PMR:	–4 dBμ EMF (typical)
Squelch sensitivity:	0 dBμ EMF (typical)

- Intermodulation rejection ratio

Marine:	68 dB
PMR:	65 dB
Spurious response rejection ratio:	70 dB
Adjacent channel selectivity:	70 dB (Wide)
	60 dB (Narrow, PMR only)
Hum and noise ratio:	40 dB (Wide)
	34 dB (Narrow, PMR only)

- Audio output power

Marine:	0.2 W at 10% distortion with an 8 Ω load
PMR:	0.35 W typical at 10% distortion with an 8 Ω load

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

14 OPTIONS

• **BP-227AX** Li-Ion BATTERY PACK
7.4 V/1850 mAh/14 Wh Li-ion battery pack. The same as supplied with the transceiver. BP-227AX must be charged with the supplied BC-152N or the optional BC-119N/121N.

• **BC-119N** DESKTOP CHARGER **+ AD-100** CHARGER ADAPTER **+ BC-145S** AC ADAPTER
For rapid charging of battery packs. A power adapter is supplied with the charger.
Charging time: Approximately 2 to 2.5 hours

• **BC-121N** MULTI-CHARGER **+ AD-100** CHARGER ADAPTER (6 pcs.) **+ BC-157S** AC ADAPTER
For rapid charging of up to 6 battery packs (six AD-100's are required) simultaneously. A power adapter may be supplied depending on version.
Charging time: Approximately 2 to 2.5 hours

• **BC-152N** DESKTOP CHARGER **+ BC-147S** AC ADAPTER
Used for regular charging of battery pack. The same as supplied with the transceiver.
Charging time: Approximately 10 hours

• **MB-86** SWIVEL BELT CLIP
Swivel type belt clip. The same as supplied with the transceiver.

• **HM-138** SPEAKER-MICROPHONE
Full-sized waterproof speaker-microphone including alligator type clip to attach to your shirt or collar, etc.

• **MB-98** BELT CLIP

• **MB-96F** LEATHER BELT HANGER
For use with MB-98

Approved Icom optional equipment is designed for optimal performance when used with an Icom transceiver.
Icom is not responsible for the destruction or damage to an Icom transceiver in the event the Icom transceiver is used with equipment that is not manufactured or approved by Icom.

Some options may not be available in some countries. Please ask your dealer for details.

QUICK REFERENCE 15

Important operating instructions are summed up in this and the following page for your simple reference.
By cutting along the line and folding on the dotted line, it will become a card sized operating guide which can easily be carried in a card case or wallet, etc.

① Cut   ② Fold   ③ Complete

‹CUT HERE›

•CHANNEL SELECTION (pp. 8, 9, 16)

•Channel 16
Push [16]

•International/USA/ATIS* and LAND channels
*German version only
Hold down [DIAL] for 1 second.

•Call channel
Hold down [16] for 1 second.

•Call channel programming (p. 12)
① Hold down [DIAL] for 1 second one or more times until the desired channel group is selected.
② Hold down [16•C] for 1 second to select the Call channel.
③ Hold down [16•C] for 3 seconds (until long beep changes to 2 short beeps)
④ Push [▲] or [▼] to select the desired channel.
⑤ Push [16•C] to program the displayed channel as the Call channel.

ICOM OPERATION GUIDE

iC-M87

■ IN CASE OF EMERGENCY

○ *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.

16 DOC

The following explanations are about the symbols on the attached Declaration of Conformity.

CE Versions of the IC-M87 which display the "CE" symbol on the serial number label, comply with the essential requirements of the European Radio and Telecommunication Terminal Directive 1999/5/EC and ATEX Directive.

This warning symbol indicates that this equipment operates in non-harmonised frequency bands and/or may be subject to licensing conditions in the country of use. Be sure to check that you have the correct version of this radio or the correct programming of this radio, to comply with national licensing requirement.

■ **SET MODE** (pp. 17 to 21)

① While holding down [SQL], turn ON the transceiver.

② Push [SQL] again to select an item.

Refer to pages 17 to 21 for Set mode item.

③ Push [▲] or [▼] to select the desired condition.

④ Push [16•C] to return to regular operating mode.

■ **DUAL/TRI-WATCH** (p. 15)

① Push [▲] or [▼] to select the desired channel.

② Hold down [SCN•DUAL] for 1 second to start Dualwatch or Tri-watch depending on the Set mode setting (p. 19).

■ **SCAN** (p.14)

Push [SCN•DUAL] to start or cancel the scan.

■ **LOCK FUNCTION** (p. 11)

Hold down [H/L] for 1 second to turn the Lock function ON or OFF.

■ **TAG CHANNELS** (p. 14)

① Push [▲] or [▼] to select the desired channel.

② Hold down both [▲] and [▼] for 1 second to set the displayed channel as a TAG channel.

■ **VOICE SCRAMBLER** (p. 12)

① Set a Scrambler code in the Set mode (p. 21).

Cannot be used on ch 16 or 70 channels.

② While holding down [SQL], push [SCN•DUAL] to turn the Scrambler function ON and OFF.

◇ Special conditions for safe use

The equipment is an intrinsically safe equipment. It can be used in a potentially explosive atmosphere.

The equipment must be powered only by the battery Icom type BP-227AX.

When the transceiver is used in a hazardous areas, either the jack cover or HM-138 must be attached to the connector. Failure to do this will make the transceiver ATEX non-compliant and may result in an accident during use in hazardous areas.

The battery shall be charged only in non hazardous areas.

Ambient operating temperature: –20°C to +55°C

◇ Meaning of ATEX marking codes

CE 0081 ⟨Ex⟩
II 2G Ex ib II A T3 Gb

CE 0081 ⟨Ex⟩

— Explosion protection marking

CE conformity marking

Identification number of notified body (where appropriate) (LCIE: 0081)

Equipment category:
1 (for Zone 0 or 20), 2 (for Zone 1 or 21), 3 (for Zone 2 or 22)

II 2G

— Type of Explosive atmosphere:
G (for gas, vapors and mist), D (for dusts)

Equipment group: I (for mines), II (for other than mines)

Equipment conforms to types of protection standardized by CENELEC (European standards)

Gas Group (see Fig. 1)

Ex ib II A T3 Gb

Intrinsic safety according EN60079-0 and EN60079-11

— Gas/Equipment Protection Level (EPL)

Marking temperatures (see Fig. 1)

Gas Group	Max. Temperature					
	T1: 450C	T2: 300C	T3: 200C	T4: 135C	T5: 100C	T6: 85C
I	Methane	—	—	—	—	—
IIA	Acetone	Ethyl alcohol	Benzine	Acetalde hyde	—	—
IIA	Ethane	I-amyl acetate	Diesel fuel	Ethyl ether	—	—
IIA	Ethyl acetate	n-butane	Aircraft fuel	—	—	—
IIA	Ammonia	n-butyl alcohol	Heating oil	—	—	—
IIA	Benzene (pure)	—	n-hexane	—	—	—
IIA	Acetic acid	—	—	—	—	—
IIA	Carbon Monoxide	—	—	—	—	—
IIA	Methanol	—	—	—	—	—
IIA	Propane	—	—	—	—	—
IIA	Toluene	—	—	—	—	—
IIB	Town Gas (Coal Gas)	Ethylene	—	—	—	—
IIC	Hydrogen	Acetylene	—	—	Carbon disulphide	Ethyl nitrate

(Fig. 1)

INDEX

INDEX

Count on us!

```
< Intended Country of Use >
□AT  □BE □CY □CZ □DK □EE
□FI  □FR □DE □GR □HU □IE
□IT  □LV □LT □LU □MT □NL
□PL □PT □SK □SI  □ES □SE
□GB □IS  □LI  □NO □CH □BG
□RO □TR □HR
```

Icom Inc.
1-1-32 Kamiminami, Hirano-ku, Osaka 547-0003, Japan