ICOM INSTRUCTIONS

VHF DIGITAL TRANSCEIVER
IC-F5220D
UHF DIGITAL TRANSCEIVER
IC-F6220D

Thank you for choosing this Icom product.
READ ALL INSTRUCTIONS carefully and completely before using this product.

Icom is not responsible for the destruction, damage to, or performance of any Icom or non-Icom equipment, if the malfunction is because of:
- Force majeure, including, but not limited to, fires, earthquakes, storms, floods, lightning, other natural disasters, disturbances, riots, war, or radioactive contamination.
- The use of Icom transceivers with any equipment that is not manufactured or approved by Icom.

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Count on us!
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Printed in Japan

IMPORTANT

This instruction sheet includes some functions that are usable only when they are preset by your dealer. The transceiver may have other functions and operations that are not described in this instruction sheet. Ask your dealer for preset function details.

EXPLICIT DEFINITIONS

WORD	DEFENITION
⚠ **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.

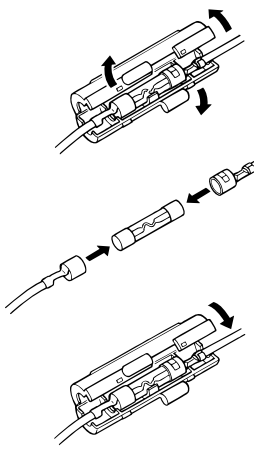
ANTENNA

A key element in the performance of any communication systems is the antenna. Contact your dealer for information regarding antennas and how to install them.

FUSE REPLACEMENT

Fuses are installed in the supplied DC power cable. If a fuse blows, track down the source of the problem, repair it, and then replace the damaged fuse with a new rated one.
ⓘ Fuse rating: 20A

NOTE: Use only 20 A fuses.



PRECAUTIONS

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

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

⚠ **WARNING! NEVER** connect the transceiver to a power source of more than 16 V DC or use reverse polarity. This could cause a fire or damage the transceiver.

⚠ **WARNING! NEVER** cut the DC power cable between the DC plug and fuse holder. If an incorrect connection is made after cutting, the transceiver might be damaged.

⚠ **WARNING! NEVER** place the transceiver where normal operation of the vehicle may be hindered or where it could cause bodily injury.

CAUTION: NEVER allow children to touch the transceiver.

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

CAUTION: DO NOT use the non-specified microphone. Other microphones have different pin assignments and may damage the transceiver.

CAUTION: DO NOT operate or place the transceiver in areas with temperatures below –30°C (–22°F) or above +60°C (+140°F), or in areas subject to direct sunlight, such as the dashboard.

CAUTION: DO NOT operate the transceiver without running the vehicle's engine. The vehicle's battery will quickly run out when the transceiver transmits while the vehicle's engine is OFF.

CAUTION: DO NOT place the transceiver in excessively dusty environments.

CAUTION: DO NOT place the transceiver against walls. This will obstruct heat dissipation.

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

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

FCC INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

VOICE CODING TECHNOLOGY

The AMBE+2™ voice coding Technology embodied in this product is protected by intellectual property rights including patent rights, copyrights and trade secrets of Digital Voice Systems, Inc. This voice coding Technology is licensed solely for use within this Communications Equipment. The user of this Technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the Object Code, or in any other way convert the Object Code into a human-readable form. U.S. Patent Nos.
#8,595,002, #8,359,197, #8,315,860, #8,200,497, #7,970,606, #6,912,495 B2.

SAFETY TRAINING INFORMATION

WARNING

Your Icom radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as "Occupational Use Only", meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is NOT intended for use by the "General Population" in an uncontrolled environment.

For compliance with FCC and IC RF Exposure Requirements, the transmitter antenna installation shall comply with the following three conditions:

1. The transmitter antenna gain shall not exceed 0 dBi.
2. IC-F5220D:
   The antenna is required to be located outside of a vehicle and kept at a distance of 57 centimeters or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the centre line along the vehicle in order to achieve 57 centimeters separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 57 centimeters away from the nearest edge of the vehicle in order to protect against exposure to bystanders.
2. IC-F6220D:
   The antenna is required to be located outside of a vehicle and kept at a distance of 41 centimeters or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the centre line along the vehicle in order to achieve 41 centimeters separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 41 centimeters away from the nearest edge of the vehicle in order to protect against exposure to bystanders.
3. IC-F5220D:
   Transmit only when people outside the vehicle are at least the recommended minimum distance of 136 centimeters away from the properly installed antenna. This separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements in the applicable RF exposure compliance standards.
3. IC-F6220D:
   Transmit only when people outside the vehicle are at least the recommended minimum distance of 117 centimeters away from the properly installed antenna. This separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements in the applicable RF exposure compliance standards.

CAUTION

To ensure that your exposure to RF electromagnetic energy is within the FCC and IC allowable limits for occupational use, always adhere to the following guidelines:

- **DO NOT** operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC and IC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio.
- **DO NOT** transmit for more than 50% of total radio use time ("50% duty cycle"). Transmitting more than 50% of the time can cause FCC and IC RF exposure compliance requirements to be exceeded. The radio is transmitting when the "transmit indicator" appears on the LCD. You can cause the radio to transmit by pressing the "PTT" switch.

Electromagnetic Interference/Compatibility
During transmissions, your Icom radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn OFF the radio in areas where signs are posted to do so. **DO NOT** operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

INFORMATION SUR LA FORMATION Á LA SÉCURITÉ

AVERTISSEMENT

Votre radio Icom produit une énergie électromagnétique de radiofréquences (RF), en mode de transmission. Cette radio est conçue pour un «usage professionnel seulement» et classée comme tel, ce qui signifie qu'elle doit être utilisée uniquement dans le cadre d'un travail par des personnes conscientes des dangers et des mesures visant à minimiser ces dangers. Elle N'EST PAS conçue pour une «utilisation grand public», dans un environnement non contrôlé.

Afin de satisfaire aux exigences de la FCC et d'IC en matière d'exposition aux RF, il est nécessaire que l'antenne soit installée conformément aux trois conditions suivantes:

1. Le gain de l'antenne du radio émetteur ne doit pas dépasser 0 dBi.
2. IC-F5220D:
   Il faut que l'antenne émettrice de cet appareil soit placée à l'extérieur d'un véhicule et tenue éloignée d'au moins 57 centimètres de toute personne pendant le fonctionnement. Dans le pire des cas, pour un petit véhicule, l'antenne doit être placée sur le toit, n'importe où dans l'axe central du véhicule, afin de respecter une distance de 57 cm du bord le plus rapproché du véhicule et ainsi éviter que les personnes présentes soient exposées.
2. IC-F6220D:
   Il faut que l'antenne émettrice de cet appareil soit placée à l'extérieur d'un véhicule et tenue éloignée d'au moins 41 centimètres de toute personne pendant le fonctionnement. Dans le pire des cas, pour un petit véhicule, l'antenne doit être placée sur le toit, n'importe où dans l'axe central du véhicule, afin de respecter une distance de 41 cm du bord le plus rapproché du véhicule et ainsi éviter que les personnes présentes soient exposées.
3. IC-F5220D:
   Émettre uniquement lorsque les personnes à l'extérieur du véhicule se trouvent à au moins la distance minimale recommandée de 136 cm de l'antenne correctement installée. Cette distance de sécurité assurera que les personnes soient placées suffisamment loin d'une antenne correctement fixée à l'extérieur pour satisfaire aux exigences en matière d'exposition aux RF, en vertu des normes de conformité applicables.
3. IC-F6220D:
   Émettre uniquement lorsque les personnes à l'extérieur du véhicule se trouvent à au moins la distance minimale recommandée de 117 cm de l'antenne correctement installée. Cette distance de sécurité assurera que les personnes soient placées suffisamment loin d'une antenne correctement fixée à l'extérieur pour satisfaire aux exigences en matière d'exposition aux RF, en vertu des normes de conformité applicables.

MISE EN GARDE

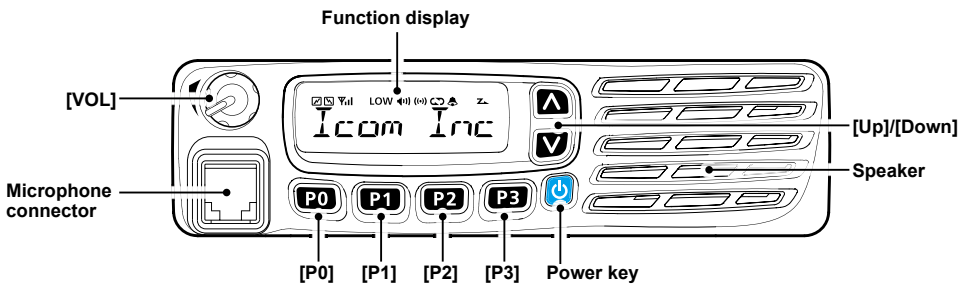
Afin de vous assurer que votre exposition à une énergie électromagnétique de RF se situe dans les limites permises par la FCC et d'IC pour une utilisation grand public, veuillez en tout temps respecter les directives suivantes:

- **NE PAS** faire fonctionner la radio sans qu'une antenne appropriée y soit fixée, car ceci risque d'endommager la radio et causer une exposition supérieure aux limites établies par la FCC et d'IC. L'antenne appropriée est celle qui est fournie avec cette radio par le fabricant ou une antenne spécialement autorisée par le fabricant pour être utilisée avec cette radio.
- **NE PAS** émettre pendant plus de 50% du temps total d'utilisation de l'appareil (« 50% du facteur d'utilisation »). Émettre pendant plus de 50% du temps total d'utilisation peut causer une exposition aux RF supérieure aux limites établies par la FCC et d'IC. La radio est en train d'emettre lorsque le temoin du mode de transmission s'affiche sur l'ecran ACL. La radio émettra si vous appuyez sur le bouton du microphone.

Interférence électromagnétique et compatibilité
En mode de transmission, votre radio Icom produit de l'énergie de RF qui peut provoquer des interférences avec d'autres appareils ou systèmes. Pour éviter de telles interférences, mettez la radio hors tension dans les secteurs où une signalisation l'exige. **NE PAS** faire fonctionner l'émetteur dans des secteurs sensibles au rayonnement électromagnétique tels que les hôpitaux, les aéronefs et les sites de dynamitage.

PANEL DESCRIPTION

NOTE: Different functions may have been assigned to the keys by your dealer, except for the Power key.

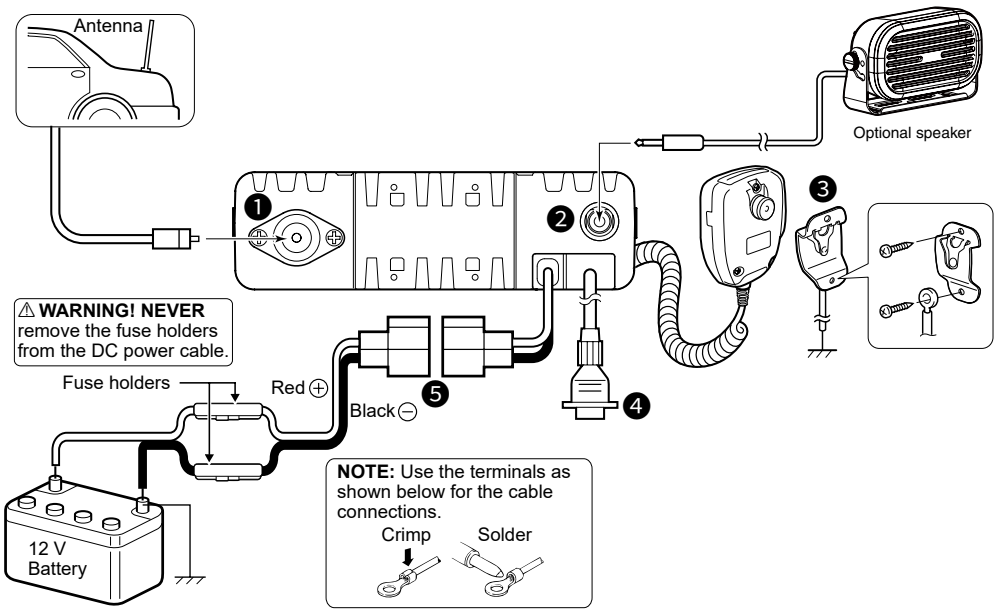


◇ About the Microphone connector

Connect the supplied or optional microphone.

CAUTION: DO NOT connect non-specified microphones. The pin assignments may be different and may damage the transceiver.

REAR PANEL CONNECTION



❶ **ANTENNA CONNECTOR**
Connect to an antenna. Contact you dealer about antenna selection and placement.

❷ **EXTERNAL SPEAKER JACK**
Connect a 4 ~ 8 Ω external speaker.

❸ **MICROPHONE HANGER**
Connect the supplied microphone hanger to the vehicle's ground for microphone ON/OFF hook functions.

❹ **OPTIONAL OPC-1939 or OPC-2078 CABLE**
Connect an external modem and dimmer control.

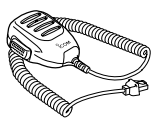
NOTE: No Digital Modulation "IN" using accessory cables.

❺ **Connect to a 12 V DC battery.**
Pay attention to polarities.

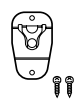
WARNING! NEVER connect to a 24 V battery. This will damage the transceiver.

SUPPLIED ACCESSORIES

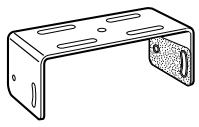
Microphone



Microphone hanger and screw set



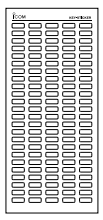
Mounting bracket



Microphone hanger cable

DC power cable

Function name stickers*



Bracket bolts

Mounting screws (M5×12mm)

Self-tapping screws (M5×20mm)

Flat washers

Spring washers

Nuts

* Used for labeling the programmable function keys according to their assigned functions.

NOTE: Some accessories are not supplied, or the shape is different, depending on the transceiver version.

OPTIONS

- **OPC-1132A/OPC-347** DC POWER CABLE
  Two fuse holders are attached. **USE** only the 20 A fuse.
  OPC-1132A: 3 m (9.8ft)
  OPC-347: 7 m (23 ft)

- **OPC-1939/OPC-2078** ACC CABLE
  Enables you to connect an external terminal.
  OPC-1939: D-sub 15-pin, an external level converter (user supplied) is required.
  OPC-2078: D-sub 25-pin, built-in level converter

NOTE: No Digital Modulation "IN" using accessory cables.

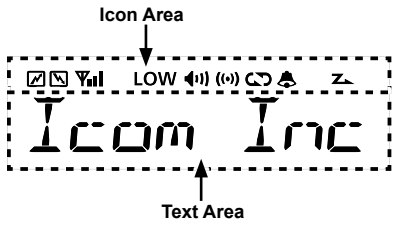
- **HM-152/HM-152T/HM-148G/HM-148T**
  HAND MICROPHONE
  HM-152: Hand microphone
  HM-152T: DTMF microphone
  HM-148G: Self ground heavy duty microphone
  HM-148T: Self-grounding heavy duty microphone with 10-key pad.
  The 10-key pad on this microphone can be used for the only DTMF code transmission.

- **HM-211** NOISE CANCELLING MICROPHONE

- **SM-26** DESKTOP MICROPHONE

- **SP-30/SP-35/SP-35L** EXTERNAL SPEAKER
  Input impedance: 4 Ω
  Maximum input power: 30 W (SP-30)/7 W (SP-35)
  SP-30: High input power level.
  SP-35: Compact and easy-to-install.
  SP-35L: 6 m (19.7 ft) cable length.

FUNCTION DISPLAY



◇ Icon Area

Indicator

SIGNAL STRENGTH ICON
Displays the relative received signal strength.

Icons

* These icons are not displayed, depending on the presetting.

TRANSMIT ICON
Displayed while transmitting a signal.

BUSY ICON
Displayed while the channel is busy (receiving).

LOW POWER ICON LOW
Displayed when low power output is selected.

AUDIBLE ICON
- In the analog mode, displayed when the CTCSS (DTCS) squelch mute is released while holding down [Monitor].
- In the digital mode, displayed while holding down [Monitor].

GPS ICON
Displayed when the GPS receiver acquires the received GPS signal from a satellite.

ENCRYPTION ICON
In the digital mode, displayed when the encryption function is ON.

BELL ICON
In the digital mode, displayed or blinks when a SDM (Short Data Message), Status Call or Call Alert is received, depending on the programming.

SCAN ICON
- Blinks during a scan.
- Displayed when a scan channel is selected.

◇ TEXT AREA

Displays the selected channel number, channel name, User Set mode contents, if set.

BASIC OPERATION

◇ Turning power ON

Push [⏻] to turn ON the transceiver.

◇ Receiving and Transmitting

Receiving:
1. Push [Up] or [Down] to select a channel.
2. When receiving a call, rotate [VOL] to adjust the audio output level to a comfortable listening level.

Transmitting:
1. Wait until the channel is clear to avoid interference.
2. While holding down [PTT], speak at your normal voice level.
3. Release [PTT] to receive.

IMPORTANT:
To maximize the readability of your signal:
1. After pushing [PTT], pause briefly before you start speaking.
2. Hold the microphone 5 ~ 10 cm (2 ~ 4 inches) from your mouth, then speak at your normal voice level.