



# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for ICOM IC-FR4000. You'll find the answers to all your questions on the ICOM IC-FR4000 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual ICOM IC-FR4000**  
**User guide ICOM IC-FR4000**  
**Operating instructions ICOM IC-FR4000**  
**Instructions for use ICOM IC-FR4000**  
**Instruction manual ICOM IC-FR4000**



UHF FM REPEATER  
**IC-FR4000**



Icom Inc.



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**Manual abstract:**

If disregarded, inconvenience only. @@@@This may result in an electrical shock or burn. BE CAREFUL! @@BE CAREFUL! If a linear amplifier is connected, set the repeater's RF output power to less than the linear amplifier's maximum input level, otherwise, the linear amplifier will be damaged. Use Icom microphones only (optional). Other manufacturer's microphones have different pin assignments, and connection to the IC-FR4000 may damage the repeater. R NEVER apply AC to the [BATTERY] terminals on the repeater rear panel. This could cause a fire or damage the repeater. R NEVER apply more than 16 V DC, such as a 24 V battery, to the [BATTERY] terminals on the repeater rear panel. This could cause a fire or damage the repeater. R NEVER let metal, wire or other objects touch any internal part or connectors on the rear panel of the repeater.

This may result in an electric shock. R NEVER expose the repeater to rain, snow or any liquids. AVOID using or placing the repeater in areas with temperatures below 30°C (22°F) or above +60°C (+140°F). Be aware that temperatures on a vehicle's dashboard can exceed 80°C (+176°F), resulting in permanent damage to the repeater if left there for extended periods. AVOID placing the repeater in excessively dusty environments or in direct sunlight. AVOID putting anything on top of the repeater. This will obstruct heat dissipation. Place the repeater in a secure place to avoid inadvertent use by children.

For U.S.

A. only CAUTION: Changes or modifications to this repeater, not expressly approved by Icom Inc., could void your authority to operate this repeater under FCC regulations. Icom, Icom Inc. and the logo are registered trademarks of Icom Incorporated (Japan) in the United states, the United Kingdom, Germany, France, Spain, Russia and/or other countries. i FORWARD Thank you for purchasing this Icom product. The ICFR4000 UHF FM REPEATER is designed and built with Icom's state of the art technology and craftsmanship. With proper care, this product should provide you years of trouble-free operation. We want to take a couple of moments of your time to thank you for making the IC-FR4000 your repeater of choice, and hope you agree with Icom's philosophy of "technology first." Many hours of research and development went into the design of your IC-FR4000 series.

SUPPLIED ACCESSORIES The following accessories are supplied with ICFR4000 series [AC120V version] q AC power cable (OPC-510) .....

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..... 1 w Spare fuses (FGB 1 A) ...

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1 e Spare fuses (ATC 20) .....

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..... 1 e Spare fuses (ATC 20) .

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@@@@!0 AF MUTE CONTROL [SP MUTE] Mutes the audio output. !1 INTERNAL SPEAKER Monitors received signals. @@@!4 TRANSMIT INDICATOR Lights red while transmitting. @7 for line connector information. r VOLUME CONTROL [VOLUME] (p.

12) Adjusts the audio output level. @(p. @(p. @@@@ Push for 1 sec. to clear the received ANI ID indication on the display and returns to original indication.

NOTE: This switch is no function available for some versions. !7 DEALER-PROGRAMMABLE SWITCH [PROG] Toggles the pre-programmed function ON or OFF when pushed. !8 PROGRAMMED FUNCTION INDICATOR Lights green while pre-programmed function is activated. !9 DC INDICATOR Lights green when in DC operation. DFunction display 32HH@HICOMHINC. q we r q MEMORY CHANNEL INDICATOR Shows the selected memory channel. w TRANSMIT POWER INDICATOR Shows the output power level. e AUDIBLE INDICATOR "@" appears in an audible condition, disappears in an inaudible condition. (When an audible condition, audio mute is cancelled.) r ALPHANUMERIC INDICATORS Shows the variety text or code information.

I Rear panel BATTERY AC i EXT SP TX/TX-RX REMOTE ACC RX GND q w e r t y u q TRANSMIT ANTENNA CONNECTOR [TX/TX-RX] Connects a transmit antenna (impedance: 50 ) and outputs transmit signals. When installing an optional internal duplexer (supplied by third party), this connects the transmit receive to an antenna. w EXTERNAL SPEAKER CONNECTOR [EXT SP] Accepts a 4 external speaker. e REMOTE CONNECTOR [REMOTE] Connects to the remote controller. · See p. 3 for remote connector information. When installing an internal duplexer (supplied by third party), do not use this connector. y AC POWER SOCKET [AC] Connects the supplied AC power cable to a domestic AC outlet. u GROUND TERMINAL [GND] Ground the repeater through this terminal to prevent electric shocks, TVI, BCI and other problems. i DC POWER INPUT TERMINALS [BATTERY] Connects the 12 V storage battery for the repeater backup when the AC power is interrupted.

These terminals are also used for DC power operation. CAUTION: NEVER short the (+) line of the DC power cable to repeater's chassis, when connecting DC power cable to the [BATTERY] terminals. Otherwise, there is danger of electric shock and/or equipment damage. 2 r ACCESSORY CONNECTOR [ACC] Connects to the remote controller. · See pgs.

3, 4 for accessory connector information. t RECEIVE ANTENNA CONNECTOR [RX] Connects a receive antenna (impedance: 50 ) and inputs receiving signals. 1 PANEL DESCRIPTION D REMOTE CONNECTOR Pin No. 1 2 3 q i Pin Name PTT +PTT AFOUT +AFOUT EXTMOD Description Specification Input terminals to transmit the repeater in relaHigh voltage=PTT ON (transmits) tion to the external equipment. An opto-isolator Hi-Z=PTT OFF is provided to facilitate PTT signals.

@@Output level Output impedance: 600 is fixed, regardless of [AF] control. Input terminal for the modulation circuit. Input impedance: 600 4 5 6 7 8 +EXTMOD BUSY +BUSY Output terminal for squelch condition Open collector=BUSY OFF (Open/Close). @@@@0 V=ON Input terminal for master/slave signal. Input terminal for selecting memory channel. Input terminal for selecting memory channel. @@Active=L Input terminal for monitor function. Input terminal for continuous tone (CTCSS/DTCS) signal. @@@@@@@Output r pin and solder it. @@@@@DC voltage is applied to pin 1 for microphone operation.

@@@@Use a cable with following current capacity. @@@@@5) GROUND (p.



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@@@3) Used for external equipment control. ACC CONNECTOR (pgs. @@The IC-FR4000 series can operate with an AC or DC power supply. @@@@The MB-78 can install the repeater's bottom side and top side. @@· Use the supplied AC power cable for connection to a domestic AC outlet. · Extension cords should not be used unless absolutely necessary. Using improper extension cords could result in fire risk. · Usually the battery is continuously charged with a small amount of current from an AC power supply through the regulator circuit in the repeater.

Discharging is therefore prevented even if the battery is not used for a long time. w Attach the MB-78 to the bottom side of the repeater. D IN DC OPERATION CAUTION: Voltages greater than 16 V DC will damage the repeater. Check the source voltage before connecting the power cable. · The [DC] indicator lights up green.

· DO NOT place the backup battery on or near the repeater. @@@@1 A for charging the battery. @@During repeater transmission, approx. 17 A of battery power is consumed. e Tighten the 1 supplied screws (M4 &tiigt codes directly. · The keys in the table below can be used for password input. · The repeater detects numbers in the same block as identical. Therefore "01234" and "56789" are the same. @@w While pushing [PROG], [ANI CLR] and [DN], turn power ON. @@@@w Set the audio and squelch levels. Rotate [SQUELCH] fully counterclockwise in advance. Rotate [VOLUME] to adjust the audio output level. Rotate [SQUELCH] clockwise until the noise disappears. @@@@w Wait for the channel to become clear. e Push and hold [PTT] to transmit, then speak into the microphone at your normal voice level.

r Release [PTT] to receive. IMPORTANT: To maximize the readability of the transmitted signal: (1) Pause briefly after pushing [PTT]. (2) Hold the microphone 1 to 2 inch (2.5 to 5 cm) from your mouth, then speak into the microphone at a normal voice level. · S01 LW RPTSQL : Noise squelch threshold level on the repeater operation · S02 LW POWER : Transmit Low power setting · S03 HW POWER : Transmit High power setting · S04 LN AFDEV : AF deviation for narrow bandwidth · S05 LW AFDEV : AF deviation for wide bandwidth · S06 LN TONEDEV : Continuous tone deviation for narrow bandwidth · S07 LW TONEDEV : Continuous tone deviation for wide bandwidth · S08 LN ETONE : External tone deviation for narrow bandwidth · S09 LW ETONE : External tone deviation for wide bandwidth · S10 LN RPTAF : AF deviation for narrow bandwidth on the repeater operation · S11 LW RPTAF : AF deviation for wide bandwidth on the repeater operation L: Low power, H: High power, W: Wide bandwidth, N: Narrow bandwidth 12 5 MAINTENANCE 1 Troubleshooting The following chart is designed to help correct problems which are not equipment malfunctions. If you are unable to locate the cause of a problem or solve it through the use of this chart, contact the nearest Icom Dealer or Service Center. SOLUTION · Re-connect the DC power cable correctly. REF. p. 6 PROBLEM POSSIBLE CAUSE Power does not come on <DC operation> when [POWER] switch is · DC power cable is improperly connected. <AC/DC common> ON. · Fuse is blown. · Check the cause, then replace the fuse with p. 14 a spare one. (Fuses are installed in the internal REG unit and LOGIC unit.

) p. 12 p. 12 p. 12 p. 1 No sounds from the · Volume level is too low. speaker. · The squelch is closed. · Rotate [VOLUME] clockwise to obtain a suitable listening level. · While in base operating mode, rotate [SQUELCH] to counterclockwise to open the squelch. · While in repeater operating mode, adjust the squelch threshold level on the set mode to open the squelch. @@@@vated such as 2/5 tone call or tone squelch. @@@@5 sary), the antenna feedline or antenna cononly strong signals are has a poor contact or short-circuited. nector. audible. Received signal cannot · Optional voice scrambler is turned OFF.

· Scrambler code is not set correctly. be understood. Output power is too low. · Output power is set to Low. · Turn the optional voice scrambler ON. · Reset the scrambler code. · Push channel selector to select the high p. 1 power operating channel. · Turn the tone squelch function ON. No contact possible with · The other station is using tone squelch.

· While in base operating mode, the repeater · Set the repeater to simplex, when other another station. transceiver is set to simplex. is set to duplex. 13 MAINTENANCE 5 1 Fuse replacement If a fuse blows or the repeater stops functioning, try to find the source of the problem, and replace the damaged fuse with a new, rated fuse. CAUTION: DISCONNECT the AC power cable and/or DC power cable from the repeater.

Otherwise, there is danger of electric shock and/or equipment damage. D LOGIC unit q Remove the bottom cover as shown on p. 11. @ @11.

@@@ @ @10) For mounting the repeater to a wall.

· MB-78 19 INCH RACK MOUNT BRACKET (pgs. 9, 10) For mounting the repeater into a 19 inch rack. · HM-100N HAND MICROPHONE · HM-100TN DTMF MICROPHONE Hand microphone with a DTMF keypad. · SM-25 DESKTOP MICROPHONE · UT-109 (#01) VOICE SCRAMBLER UNIT (p. 11) Non-rolling type (max. 32 codes). · UT-110 (#01) VOICE SCRAMBLER UNIT (p. 11) Rolling type (max. 1020 codes). The scrambler systems of the UT-109 and UT-110 are not compatible with each other.

I Specifications Specifications are measured in accordance with EIA/TIA-603. : 400.000430.000 MHz 430.000450.000 MHz 450.000480.000 MHz 480.000-512.000 MHz · Channel specing : 12.

5/25.0 kHz type · PLL channel step : 5.0, 6.25 kHz · Frequency stability :  $\pm 1.5$  ppm\*/ $\pm 2$ .

5 ppm\* \* Depends on version · Number of channels : Max. 32 channel · Antenna connector : N-type  $\times 2$  (50 ) · Operating temp. range : 30°C to +60°C (22°F to +140°F) · Power supply voltage : 100/120 V AC (50/60 Hz)\* 220/240 V AC (50/60 Hz)\* 13.6 V DC (negative ground) \* Depends on version · Current drain (at 13.6 V) : TX high (50 W) 20.

0 A typical Max. audio 2.0 A typical Stand-by 1.0 A typical · Dimensions : 410(W)  $\times$  110(H)  $\times$  360(D) mm (Projections not included) 6(W)  $\times$  2 5/8(H)  $\times$  5 1/2(D) in · Weight (approx.) : 12 kg; 26 lb 7 oz · Frequency coverage D Transmitter : 50 W : Variable reactance frequency modulation system · Max.

frequency deviation :  $\pm 5.0$  kHz (Wide),  $\pm 2.5$  kHz (Narrow) · Spurious emissions : 70 dBc typical · Adjacent channel power : More than 70 dB (Wide), More than 60 dB (Narrow) · Audio harmonic distortion : 3.0% typical (at 1 kHz, 40% deviation) · Hum and noise : More than 40 dB (Wide), More than 34 dB (Narrow) · Microphone impedance : 600 (8-pin modular) · RF output power · Modulation system D Receiver : Double conversion superheterodyne system · Sensitivity (12 dB SINAD) : 0.



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25  $\mu$ V typical · Intermediate frequencies : 1st; 70.

0 MHz, 2nd; 455 kHz · Adjacent channel selectivity : More than 70 dB (Wide), More than 60 dB (Narrow) · Spurious response : More than 70 dB · Intermodulation : More than 70 dB · Hum and noise : More than 40 dB (Wide), More than 34 dB (Narrow) · Audio output power : 2.5 W typical at 10% distortion with a 4 load · External speaker connector: 2-conductor 3.5 (d) mm (1/8") 8 15 All stated specifications are subject to change without notice or obligation. · Receive system MEMO Count on us! A-6228H-1EX Printed in Japan © 2003 Icom Inc. 1-1-32 Kamiminami, Hirano-ku, Osaka 547-0003 Japan .



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