



Professional Two-Way
HR Series Portable Radio

User Manual

Model: VHF MURS HR-220M License-Free Business



- Analog, VHF MURS
- 2 Watt VHF
- 1.7" LCD Color Display
- 20 Channel Capability
- Loud Audio Output - 1000mW
- Rugged, Compact Design
- IP68: Resistant to Water/Dust Intrusion
- FCC Approved
- CTCSS and DCS Tone Codes
- Channel Scan
- DTMF (Encode Only), 2-Tone (Encode Only)
- 6 PFB's (Programmable Function Buttons)

1-800-872-1872
www.ritron.com

Dear Valued Ritron Customer,

Thank you for your purchase of the VHF MURS License-Free HR-220M radio.

Each radio comes pre-programmed with all 7 of the allowed MURS channel frequencies and 1 of the 258 different tone codes.

The table below lists the factory default channel frequencies and CTCSS tones pre-programmed into your radio.

IMPORTANT: To re-program your HR-220M radio from the factory defaults you must first download the FREE HR-220M PC programming software on your Windows computer, and you must purchase the required programming cable (pn 60201144) 25\$ + freight. Call Ritron at 1-800-872-1872.

1. Go to <https://www.ritron.com/tools> to download the FREE "HR220M VHF MURS radio PC Programming Software"
2. Please call Ritron at **1-800-872-1872** to order pn 60201144 programming cable for the HR-220M radio. (\$25 +freight. VISA or MasterCard accepted). Subject to change w/o notice.

NEW!

NOTE: HR-220M DOES support selective signaling capability. (e.g. GateGuard systems using 2-tone and DTMF)

HR-220M VHF MURS FACTORY DEFAULT SETTINGS

| Channel | VHF MURS Freq. MHz | Ritron Table Freq. Code # | Tone Hz | Ritron Tone Code # | TX Pwr | Bandwidth |
|---------|--------------------|---------------------------|---------|--------------------|---------|----------------|
| 1 | 151.8200 | 19 | 77 | 4 | 2 Watts | Narrow 12.5KHz |
| 2 | 151.8800 | 20 | 77 | 4 | 2 Watts | Narrow 12.5KHz |
| 3 | 151.9400 | 21 | 77 | 4 | 2 Watts | Narrow 12.5KHz |
| 4 | 154.5700 | 23 | 77 | 4 | 2 Watts | Narrow 12.5KHz |
| 5 | 154.6000 | 22 | 77 | 4 | 2 Watts | Narrow 12.5KHz |
| 6 | 154.5700 | 02 | 77 | 4 | 2 Watts | Wide 25KHz |
| 7 | 154.6000 | 01 | 77 | 4 | 2 Watts | Wide 25KHz |

FC# = Frequency Code

The standard antenna supplied with the HR Series radio is cut for operation at the following frequency bands:

VHF: MURS only

Note: Custom frequencies require optional programming by your Authorized Ritron Dealer and use of the optional PC Programming Kit.

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| Models | Description |
|---------|--|
| HR-220M | VHF, MURS 2 Watt 20 Channel Capacity |

Optional PC Programming for Custom Configurations. See Front Cover

Standard antenna supplied is cut for operation in the following frequency ranges:

VHF: 150-165MHz



HR-220M Radio
Each Radio includes:
Antenna.
Rechargeable
Lithium-Ion Battery.
Spring Action Belt Clip.
Drop-In Charger Tray &
110-220V AC Adaptor.

3" Optional Antenna (AF-X115S)

Note: The frequency band is shown on the bottom of antenna.
VHF = 136-174MHz



110-220V AC Adaptor

| Accessories | Part No. |
|-------------------------------|------------|
| Speaker Microphone, Multi-Pin | RSM-11HR |
| Replacement, Battery Pack | BP-HR15-Li |
| Replacement, Belt Clip | CB-HR |
| 6 Unit Charger Kit, fits HR | BC-6PR-KIT |
| Programming Cable | 60201144 |



RSM-11HR Multi-Pin



CB-HR Spring Action Belt Clip



BC-TRAY-HR Drop-in Charging Tray



BC-6PR-KIT (fits HR)

6 Unit Charger Kit includes: Base Mounting Plate. 6 plug pigtail cable, (6) adapters and 110-220 AC Adapter.

Kit does NOT include 6 individual radio charging stands. Charging stands come standard with each HR series radio.

Dimensions: 11"wide x 7"L x 4"H.

Assembly Required.

Standard **HR series** audio accessories (e.g. remote speaker mic) are not compatible with VOX function. VOX function requires special VOX capable audio accessories. Contact factory for availability.

Installing Audio Accessories

1. Remove the fastener that secures the audio accessory dust cover to the radio.
2. Plug in the Ritron multi-pin audio accessory,

Battery Installation/Removal

1. Turn the radio OFF.
2. Align tabs at TOP of battery pack with the slots at the TOP of the radio body.
3. Pivot the BOTTOM of the battery towards the radio body until you hear the spring latches engage with a click at the bottom of the radio.

To Remove

- 1 Turn radio OFF.
- 2 Slide latch at BOTTOM in direction of the OPEN arrow.
- 3 Gently pivot the BOTTOM of the battery pack away from the radio.

Antenna - Thread the matching antenna until mating connector is fully seated.

Getting To Know Your HR Series Radio

Controls

With PC Program and optional purchase of the programming cable, you can program PFB's to perform specific functions.

1. Orange Top Button (Programmable)
2. Push-to-Talk Button (Not Programmable)
3. Top Side Button (Programmable)
4. Bottom Side Button (Programmable)
5. LED Indicators: Red = Transmit, Green = Receiving, Flashing Orange = Scanning
6. On/Off & Volume Control
7. Channel Control: 20 Channels
8. Built-In Speaker
9. Built-In Microphone
10. Audio Accessory/Dust Cover
11. Spring-Action Belt Clip

Keypad

- Menu: Access/Change Settings
- P1: Programmable Function Button
- P2: Programmable Function Button
- P3: Programmable Function Button
- Green: No Function
- Red: Return to Home Screen

Optional Functions via PC Programming

Functions That Can Be Allocated to a Programmable Function Button

1. **PTT Call:** Initiates a portable radio call.
2. **VOX On/Off:** Enables or disables VOX function.
3. **Monitor:** Enables or disables the squelch function.
4. **Zone Switch:** Changes current Zone of the HR radio.
5. **Scan On/Off:** Enables or disables scanning.
6. **DTMF Encode:** Send a DTMF code string to other radios. Similar to 2-tone.
7. **2-Tone Encode:** Transmits the programmed 2-Tone signal for the current channel.
8. **Prompt Tone Switch:** Prompt tone is changed on the current channel.
9. **Scrambler Switch:** Turns the scrambler On or Off. On the selected channel.

BC-TRAY-HR Charger Tray and AC Adaptor

Operating instruction:

1. Insert AC Adaptor into the Charging Tray.
2. Plug the AC power cube into a wall outlet.
3. Turn the transceiver off.
4. Insert the battery pack into the charger with or without the transceiver attached.

Color Status of Charging Tray LED

- Steady RED.....Battery Charging
- Steady GREEN ... Battery Charging Complete
- Steady AMBER ... Trickle Charge, Replace Battery
- Blinking AMBER. Abnormal Temperature
- Blinking RED..... Replace Battery

BP-HR15-Li

- Fully charge the battery before use for maximum capacity and operation.
- The battery is designed for the HR Series charger only. Please do not charge the battery with any other brand charger. Turn the radio off before charging.
- Do not disassemble **BP-HR15-Li**
- If the battery terminal is contacted with any metals or conductive substances, it may do harm to the body or battery.
- **Battery Type:** Rechargeable Lithium-Ion, 1800MAH
- **Battery Life:** Duty cycle: 5% transmit, 5% receive, 90% standby = 14 Hours



BC-TRAY-HR
Drop-in Charging Tray

Specifications:

- Input voltage: 12VDC,1A
- Output voltage: 8.4VDC, 850mA
- Charge time: 3 Hours



Operating Your HR Series Portable Radio

- A voice announcement will be heard on each channel change depending on channel type. (e.g. "Analog 1")
- To Talk, press and hold the PTT button, speak into the microphone on the radio, and Release to listen. **Note:** For maximum clarity hold the radio 2-3 radio inches away from your mouth and speak in a normal tone of voice.

Programmable Function Buttons (PFB's)

Programmable Function Buttons (PFB) provide easy, one-button access to a specific feature/function. When momentarily pressed, the PFB can be PC programmed to operate as follows:

- No function when pressed.
- Turn ON or OFF a specific feature assigned to that PFB.

The table listed below indicates the Factory Default settings for each of the PFB's on your radio. The default function can be changed via PC programming, contact Ritron for details. For advanced features, please see PCB Functionality within the PC Programmer.

| Factory PF Button | Default Function | Description of Function |
|-----------------------|---------------------------|--|
| #1 Orange Top Button | Emergency (Long Press) | Lone Worker Alarm: When configured, radio can send automated message/signal when pressed. |
| #3 Upper Side Button | Monitor (Long Press) | Analog Ch. A long press of the Monitor Button will unmute the receiver and you will hear all radio traffic on the channel. If there is no radio traffic on the channel, you will hear continuous squelch noise. A second press of the Monitor Button will mute the radio receiver. |
| #4 Bottom Side Button | None | |
| Keyboard: | | |
| P1 | None | |
| P2 | 2-tone (Short Press) | Sends an encode code to a radio to perform a function (e.g. Open a Gate). Must configure in PC programmer to use 2-Tone. |
| P3 | Scan Off/On (Short Press) | Enable/Disable the scan feature on your radio |

SAFETY STANDARDS

The FCC (with its action in General Docket 79-144, (March 13, 1985) has adopted a safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated equipment. Ritron observes these guidelines and recommends that you do also:

- DO NOT hold the radio so that the antenna is very close to or touching exposed parts of the body, especially the face or eyes, while transmitting. Keep the radio vertical, four inches away while talking into the front panel.
- DO NOT press the Push-To-Talk except when you intend to transmit.
- DO NOT operate radio equipment near electrical blasting caps or in an explosive atmosphere.
- DO NOT allow children to play with any radio equipment that contains a transmitting device.
- Repair of Ritron products should be performed only by Ritron authorized personnel.

SERVICE

Federal law prohibits you from making any internal adjustments to the transmitter and/or from changing transmit frequencies unless you are specifically designated by the licensee.

If your radio equipment fails to operate properly, or you wish to have the radio programmed, contact your authorized dealer or Ritron.

RITRON, INC.,
c/o Repair Department
505 West Carmel Drive,
Carmel, IN 46082-1998
Phone: 317-846-1201



RF ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION
ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION, AND
OPERATIONAL INSTRUCTIONS FOR FCC OCCUPATIONAL USE REQUIREMENTS

BEFORE USING YOUR PORTABLE 2-WAY RADIO, READ THIS IMPORTANT RF ENERGY AWARENESS AND CONTROL INFORMATION AND OPERATIONAL INSTRUCTIONS TO ENSURE COMPLIANCE WITH THE FCC'S RF EXPOSURE GUIDELINES.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES, OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRABLE OPERATION.

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE, SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

NOTE: This equipment has been tested and found to comply with the limits for a Class B device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna. -Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. -Consult the dealer or an experienced radio/TV technician for help.

NOTICE: This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

This 2-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses radio frequency (RF) energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy. Other forms include, but are not limited to, electric power, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health and industry work with organizations to develop standards for exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection. All 2-way radios marketed in North America are designed, manufactured and tested to ensure they meet government established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of 2-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it. Please refer to the following websites for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits.

<http://www.fcc.gov/oet/rfsafety/rf-faqs.html> <http://www.fcc.gov/oet/rfsafety/rf-faqs.html>

<http://www.osha.gov/SLTC/radiofrequencyradiation/index.html>

<http://www.osha.gov/SLTC/radiofrequencyradiation/index.html>

FEDERAL COMMUNICATIONS COMMISSION REGULATIONS -The FCC rules require manufacturers to comply with the FCC RF energy exposure limits for portable 2-way radios before they can be marketed in the U.S. When 2-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your Ritron 2-way radio has an RF exposure product label. Also, this user manual includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

COMPLIANCE WITH RF EXPOSURE STANDARDS -Your Ritron 2-way radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) for human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at operating duty factors of up to 50% transmitting and is authorized by the FCC for occupational use only. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.

NOTE: The approved batteries supplied with this radio are rated for a 5-5-90 duty factor (5% talk -5% listen - 90% standby), even though this radio complies with the FCC occupational RF exposure limits and may operate at duty factors of up to 50% talk.

Have questions? Call 1-800-872-1872 or visit our website at www.ritron.com

Your Ritron 2-way radio complies with the following RF energy exposure standards and guidelines: • United States Federal Communications Commission, Code of Federal Regulations; 47 CFR JJ 1.1307,

1. 1310, 2.1091 and 2.1093

- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95.3-2003
- Institute of Electrical and Electronic Engineers (IEEE) C95.3 2003Edition

RF EXPOSURE COMPLIANCE AND CONTROL GUIDELINES AND OPERATING INSTRUCTIONS -To control your exposure and ensure compliance with the occupational/controlled environment exposure limits always adhere to the following procedures.

GUIDELINES:

- Do not remove the RF Exposure Label from the device.
- This user manual should accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

OPERATING INSTRUCTIONS:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), push the Push-To-Talk (PTT) button. To receive calls, release the PTT button. Transmitting 50% of the time, or less, is important because this radio generates measurable RF energy exposure only when transmitting (in terms of measuring for standards compliance).
- Hold the radio in a vertical position in front of face with the microphone (and the other parts of the radio, including the antenna) at least one inch (2.5 cm) away from the nose. Keeping the radio at the proper distance is important because RF exposures decrease with distance from the antenna. Antenna should be kept away from eyes.
- When worn on the body, always place the radio in a Ritron approved clip, holder, holster, case, or body harness for this product. Using approved body-worn accessories is important because the use of other manufacturers' non-approved accessories may result in exposure levels, which exceed the FCC's occupational /controlled environment RF exposure limits.
- If you are not using a body-worn accessory and are not using the radio in the intended use position in front of the face, then ensure the antenna and the radio are kept at least 2.5 cm (one inch) from the body when transmitting. Keeping the radio at the proper distance is important because RF exposures decrease with increasing distance from the antenna.
- Use only Ritron approved supplied or replacement antennas, batteries, and accessories. Use of non-Ritron approved antennas, batteries, and accessories may exceed the FCC RF exposure guidelines.
- For a list of Ritron approved accessories see this user manual, or visit www.ritron.com or call Ritron at 800-872-1872.

CONTACT INFORMATION

For additional information on exposure requirements or other information, contact Ritron at 1-800-872-1872.

Have questions? Call 1-800-872-1872 or visit our website at www.ritron.com

RITRON, INC. LIMITED WARRANTY

WHAT THIS WARRANTY COVERS:

RITRON, INC. ("RITRON") provides the following warranty against defects in materials and/or workmanship in RITRON Radios and Accessories under normal use and service during the applicable warranty period (as stated below). "Accessories" means antennas, holsters, chargers, earphones, speaker/microphones and items contained in the programming and programming/service kits.

| WHAT IS COVERED | FOR HOW LONG | WHAT RITRON WILL DO |
|------------------|--------------|---|
| HR Series Radios | 1 year* | During the first year after date of purchase, RITRON will repair or replace the defective product, at RITRON's option, parts and labor included at no charge. |
| Accessories | 90 days* | *After date of purchase |

WHAT THIS WARRANTY DOES NOT COVER:

- Any technical information provided with the covered product or any other RITRON products;
- Installation, maintenance or service of the product, unless this is covered by a separate written agreement with RITRON;
- Any products not furnished by RITRON which are attached or used with the covered product, or defects or damage from the use of the covered product with equipment that is not covered (such as defects or damage from the charging or use of batteries other than with covered product);
- Defects or damage, including broken antennas, resulting from:
 - misuse, abuse, improper maintenance, alteration, modification, neglect, accident or act of God,
 - the use of covered products other than in normal and customary manner or,
 - improper testing or installation;
- Defects or damages from unauthorized disassembly, repair or modification, or where unauthorized disassembly, repair or modification prevents inspection and testing necessary to validate warranty claims;
- Defects or damages in which the serial number has been removed, altered or defaced.
- Batteries if any of the seals are not intact.

IMPORTANT: This warranty sets forth the full extent of RITRON's express responsibilities regarding the covered products, and is given in lieu of all other express warranties. What RITRON has agreed to do above is your sole and exclusive remedy. No person is authorized to make any other warranty to you on behalf of RITRON. Warranties implied by state law, such as implied warranties of merchantability and fitness for a particular purpose, are limited to the duration of this limited warranty as it applies to the covered product. Incidental and consequential damages are not recoverable under this warranty (this includes loss of use or time, inconvenience, business interruption, commercial loss, lost profits or savings). Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. Because each covered product system is unique, RITRON disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

WHO IS COVERED BY THIS WARRANTY:

This warranty is given only to the purchaser or lessee of covered products when acquired for use, not resale. This warranty is not assignable or transferable.

HOW TO GET WARRANTY SERVICE:

To receive warranty service, you must deliver or send the defective product, delivery costs and insurance prepaid, within the applicable warranty period, to

RITRON, INC., 505 West Carmel Drive, Carmel, Indiana 46032,

Attention: Warranty Department.

Please point out the nature of the defect in as much detail as you can. You must retain your sales or lease receipt (or other written evidence of the date of purchase) and deliver it along with the product. If RITRON chooses to repair or replace a defective product, RITRON may replace the product or any part or component with reconditioned product, parts or components. Replacements are covered for the balance of the original applicable warranty period. All replaced covered products, parts or components become RITRON's property.

RIGHTS TO SOFTWARE RETAINED :

Title and all rights or licenses to patents, copyrights, trademarks and trade secrets in any RITRON software contained in covered products are and shall remain in RITRON. RITRON nevertheless grants you a limited non-exclusive, transferable right to use the RITRON software only in conjunction with covered products. No other license or right to the RITRON software is granted or permitted.

YOUR RIGHTS UNDER STATE LAW: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

WHERE THIS WARRANTY IS VALID: This warranty is valid only within the United States, the District of Columbia and Puerto Rico.

Questions? CALL 800-USA-1-USA (872-1872)

