



Owner's Guide

(PRELIMINARY)

**Model G-220 GMRS / FRS
combination with 38 CTCSS
codes**

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FCC Licensing Information

This Midland model G-220 radio when set for channels 1-7 and 15-22 operates on GMRS frequencies which require a license from the Federal Communications Commission (FCC) for business, personal, and recreational use. A GMRS license held by an individual may be shared by immediate family members.

At the date of this publication the application for your FCC license is made on FCC form 605 (with optional Schedule F). To obtain forms, call the FCC forms hotline at: **1-800-418-3676** or go to **<http://www.fcc.gov>**.

For questions concerning licensing, contact the FCC at **1-888-CALL-FCC** (1-888-225-5322), or go to **<http://www.fcc.gov>**.

OPTIONAL ACCESSORIES FOR YOUR RADIO

Accessory Name	Model Number
Standard wall Charger.....	18-396
Charger Stand	18-383
Dual Charger Stand	18-385
Lapel Microphone with Ear-bud Speaker.....	22-405
Speaker/Microphone.....	22-M11
Boom Microphone Headset	22-540

Call 816 241 8500 ext. 200 to order accessories.

THIS RADIO COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE CONDITION THAT THIS DEVICE DOES NOT CAUSE HARMFUL INTERFERENCE.

Your Midland model G-220 combines access to FRS (Family Radio Service) channels with operation on GMRS channels. The Family Radio Service is provided for by the FCC and is totally license free. Use of the GMRS channels requires FCC licensing. You can use your G-220 on the FRS UHF FM band for personal communications at no charge. The G-220 uses maximum allowable power on FRS for range up to 2 miles and higher power on GMRS channels to provide you with line-of-sight communications for a range up to 5 miles. Use for fishing, hunting, picnics, biking, business, or any other activity where communications are needed for convenience or safety. The model G-220 operates on 22 channels of FRS and GMRS

combined to provide the best in quiet and private communication. Channels 1 through 7 are co-shared by FRS and GMRS users. This means that a person with a FRS unlicensed radio can talk to a person using a licensed GMRS radio on these channels. Channels 8 through 14 are exclusively FRS channels. Radios made strictly for GMRS use do not cover these channels. Channels 15 through 22 are exclusively GMRS channels. Radios made for FRS use do not cover these channels. Also this radio offers power save, and auto-squelch.

The model G-220 incorporates channels with 38 different CTCSS codes to provide the best in quiet communications. Also this radio offers scan, power save, and a multifunction back-lighted liquid crystal display.

TIPS FOR GETTING THE MOST FROM YOUR G-220

Due to the band of operation (462 MHz) the G-220 provides communications that are virtually free of atmospheric interference (skip) that is common on lower frequency bands. Along with this and an antenna system that is very efficient, communications range is surprisingly good. Many times the limit to maximum possible range is environmental factors such as blockage caused by trees, buildings, hills, or other obstructions. If you find communication is not possible, many times this can be overcome by moving only a few feet to a new location. Range is greatly reduced while operating from a metal building or from a vehicle. Battery condition also affects range. The G-220 operates on rechargeable Ni-MH batteries or alkaline batteries. While this unit has been designed with gaskets for water resistance and ruggedness it is a precision piece of electronic equipment that should not be exposed to water or handled carelessly. Normal care should result in years of trouble free operation. Do not leave batteries installed over a long period of time as leakage may occur, that can destroy the radio. If you experience problems operating the radio, turn off the radio, press and hold the “F” button and turn on the radio. This will cause the radio to return to the factory settings. **Always save your receipt, as it is required for warranty consideration.**

WARNING

Your wireless hand-held portable transceiver contains a low power transmitter. When the Push-to-Talk (PTT) button is pressed it sends out radio frequency (RF) signals. The device is authorized to operate at a duty factor not to exceed 50%. In August 1996, the Federal Communications Commission (FCC) adopted RF exposure guidelines with safety levels for hand-held wireless devices.

To maintain compliance with the FCC's RF exposure guidelines, this transmitter and its antenna must maintain a separation distance of least 2 inches (5 centimeters) from your face. Speak in a normal voice, with the antenna pointed up and away from the face at the required separation distance. The belt clip is for storage purposes only. **DO NOT TRANSMIT WHILE USING THE BELT CLIP.** To transmit, hold the device away from your body and ensure the antenna is at least 2 inches (5 centimeters) from your body when transmitting.

A NOTE ABOUT THE CTCSS CODES

This radio incorporates 38 CTCSS (Continuous Tone Coded Squelch System) codes that, when activated, prevent the user from hearing other radios that do not have the same code. These codes **do not** make your conversation private. If you experience difficulties contacting or hearing other radios in your group make sure the **CTCSS** code is set the same on all radios. If you are using the G-220 where interference from other radios or electrical devices are present, enabling the **CTCSS** codes will usually mute the interference. Many times interference will be noticed by the presence of loud static from the speaker.

PREPARATION

BATTERIES

G-220 radios operate with 4 AAA Alkaline, or Ni-MH (nickel metal hydride) batteries (optional) or at reduced transmitter power with 3 AA Alkaline, Ni-Cad (Nickel Cadmium) or Ni-MH (nickel metal hydride) batteries (optional). Alkaline AA batteries will provide about 45 hours of use, Ni-Cad batteries will provide about 15 hours of use and Ni-MH batteries will provide about 24 hours of use. Alkaline AAA batteries will provide about 15 hours of use and Ni-MH batteries will provide about 10 hours of use. The G-220 may be supplied with a wall charger. Ni-MH and Ni-Cad batteries must be charged prior to use. Charge at least 10 hours with the standard charger. **DO NOT attempt to charge any type of Alkaline batteries in this radio.**

To Install Batteries:

Hold the radio face down. Press the latch so it swings away from the cover.

1. Lift the battery cover slightly. Gently slide the cover off the unit.
2. Insert 4 AAA batteries observing the proper polarity.
Alternate option: remove AAA battery adapter insert. Insert 3 AA batteries observing the proper polarity.
3. Replace the battery cover over the batteries and fasten with the latch.

Battery Indicator:

The battery Condition indicator in the display will show the amount of charge of your batteries. Replace alkaline or recharge the Ni-MH batteries as soon as possible after the indicator shows 2 segments or less of the battery lit.

CHARGING THE BATTERIES

The 18-383 charger and Ni-MH AAA batteries may be supplied with the radio. This charger is designed to recharge Ni-MH AAA batteries and AA Ni-Cad batteries only. Install the batteries observing their polarity. If you are using rechargeable batteries and the Midland standard charger (model 18-396), plug the charger into a 115 volt

wall socket and the charger plug into the charge jack under the cover marked “CHG” (item 11 on Page 8 illustration) on the **bottom** of the radio or into the drop-in charger. Allow the batteries to charge 10 hours for Ni-MH AAA or Ni-Cad AA prior to use. When using a drop-in charger follow the setup instructions then simply set the radio in the charger stand and observe that the LED on the charger is lit. The radio should be turned off while charging. **Never attempt to charge any type of Alkaline battery in this radio**

BELT CLIP

The G-220 comes standard with a belt clip. Attach it to the radio back by sliding the top of the clip up over the two rectangular bosses on the back of the radio until it snaps into place. To detach the belt clip, press the lever inside the top of the clip away from the radio body and slide the clip toward the bottom of the radio.



The belt clip is intended for storage of the radio only (waiting for a call). Do not transmit the radio while attached to your belt. (see warning on page 4)

QUICK USE INSTRUCTIONS:

Install fresh Alkaline or fully charged Ni-MH batteries.

Turn the unit on by rotating the ON/OFF Volume control clockwise.

The squelch is factory set and is not adjustable.

Make sure the radio you want to talk to does not have the CTCSS or other codes turned on.

To talk, press and hold the “PTT” (Push to Talk) button on the side of the radio marked “PTT”. Talk into the front of the radio about 6 inches from your mouth.

To listen release the “PTT” button.



Other functions will be described later.

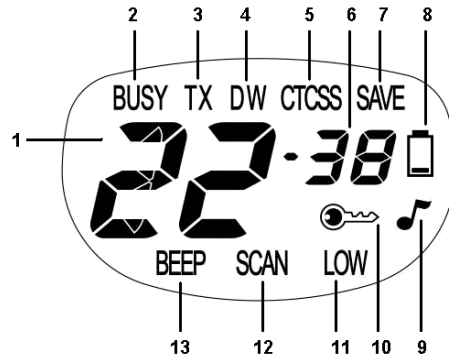
POWER SAVE CIRCUIT

This part of the operation of the radio is completely automatic and not adjustable. When the radio has not transmitted or received a signal for several seconds it will begin to cycle from a sleep mode to fully on. This occurs several times a minute. If a signal is received or you cause the radio to transmit, the radio will become fully on. This cycling from sleep to fully on increases the battery life more than 50%. An icon in the upper right of the display flashing “SAVE” will verify this.

RANGE OF UHF RADIOS

The best range between portable UHF radios is achieved when they are operating in open terrain outside of buildings and vehicles. Anyone using a portable unit inside a vehicle will experience a significant loss of range.

DISPLAY SYMBOLS



CAUTION: DON'T EXPOSE THE DISPLAY TO EXTREME HOT OR COLD TEMPERATURE

1. **Channel number:** Displays channel number 1-22.
2. **BUSY Symbol** Indicates unit is receiving a signal.
3. **TX Symbol** Indicates unit transmitting.
4. **DW Symbol:** Indicates Dual Watch channel selection is active.
5. **CTCSS Code Symbol:** Indicates “CTCSS” tone is active
6. Shows the “CTCSS” code you have selected. When this is on, other radios you talk to must be set to the same code.
7. **SAVE Symbol:** Flashes indicating battery save is active.
8. **Battery symbol** shows the battery condition. Replace or recharge the batteries when this indicator is flashing.
9. **Musical note** indicates **ROGER BEEP** is on.
10. **Key Symbol** indicates when the keypad has been locked. Only the “PTT” and “CALL” buttons are active when this indicator is on.
11. **LOW Symbol:** Indicates transmitter is in low power mode.
12. **SCAN** indicates the normal scan mode is in use
13. **BEEP** indicates the button press tone is active.

FEATURES AND LOCATION OF CONTROLS



1-Up/Down Buttons 2-Monitor Button 3-Push to Talk Button
5-Call Button 6-Accessory jacks 7-On/Off Volume Control 8-Enter Button
9-Function Button 10-charging contacts 11-Charge Jack

THE RADIO MUST NOT BE SCANNING OR TRANSMITTING AND THE CONTROLS NOT LOCKED BEFORE THE CONTROLS WILL WORK PROPERLY.

TURNING THE RADIO ON OR OFF

Rotate the ON/OFF Volume control (7) clockwise to turn the radio ON. An audible tone will indicate the radio is on. The display will go through a 1 second self test and go to operation mode. Rotate the ON/OFF Volume control counter clockwise to turn the radio off.

LOCKING THE CONTROLS

Press and hold the “**MON**” button (3) for about 3 seconds a beep (if enabled) will be heard and the **KEY** icon will be displayed. The “**PTT**” and the “**CALL**” are the only buttons active. If any other buttons are pressed 3 quick beeps will be heard.

UNLOCKING THE CONTROLS

Press and hold the **“MON”** button (3) for about 3 seconds a beep (if enabled) will be heard and the KEY icon will **not** be displayed.

ADJUSTING THE VOLUME

Rotate the ON/OFF Volume control (7) clockwise to increase the volume. Rotate the ON/OFF Volume control counter clockwise to decrease the volume.


ADJUSTING THE SQUELCH

Squelch is preset, no adjustment is available.


USING THE CALL FUNCTION

Press and release the **“CALL”** button (5) on the side of the radio.

This will cause the radio to transmit a tone to alert the other people in your group to listen for a message.

 Use of the call function is discouraged if using the 22-405 or the 22-540

USING THE MONITOR FUNCTION

1. Press and release the **“MON”** button (3) on the side of the radio to open the squelch.
 -  This allows you to over ride the squelch and the **“CTCSS”** tones. This is useful to monitor the channel before you transmit to ensure there is not someone using the channel when you have **“CTCSS”** tones programmed. This is also useful if you suspect someone in your group does not have the proper **“CTCSS”** tones programmed.
2. Press and release the **“MON”** button or wait 10 seconds to restore the squelch to normal.

TURNING ON OR OFF THE BUTTON PRESS BEEP

1. Press and release the **“F”** button until the **“BEEP”** icon flashes. The display will show **“FF”** or **“ON”** depending on the previous setting.
2. Press and release the **“/”** or **“\”** button to change the setting.
3. The setting **“ON”** is Beep on. The setting **“FF”** is Beep off.
4. Press and release the **“ENTER”** button to return to operating mode.

TURNING ON THE DISPLAY BACKLIGHT

Press and release the **“ENTER”** button (8). A beep will be heard (if enabled). The back-light will stay on for about 5 seconds then turn off.

TURNING THE ROGER BEEP ON OR OFF

Roger beep is a sound the radio transmits when you release the **“PTT”** button (4).

1. Press and release the “F” button until the **musical note icon** flashes. The display will show “FF” or “ON” depending on the previous setting.
2. Press and release the “\” or “/” button to change the setting.
 - ☞ The setting “ON” is Roger beep on. The setting “FF” is Roger beep off.
 - ☞ The Roger beep is the same sound as the Power Up tone
3. Press and release the “ENTER” button to return to operating mode.
 - 👉 Use of roger beep is discouraged when earphones or headsets are in use.

CHOOSING HIGH OR LOW POWER TRANSMIT

The G-220 has two power settings. For maximum range the transmitter is normally set to 2 watts out except for channels 8 through 14 which are restricted to low power. Low Power (0.5 Watts) setting is useful when battery life is critical or if you wish to minimize interference to others close to you. To choose:

1. Press and release the “F” button (9) four times, the “LOW” icon will begin flashing in the lower center of the display.
2. Press and release the “\” or “/” button to change the setting.
3. Press and release the “ENTER” button to return to operating mode.

ACTIVATING SCAN FUNCTIONS

The G-220 has two scan modes. The most popular and most used is the “BUSY” channel scan. This allows the radio to stop on a channel that someone is talking on. When the radio stops on a “Busy” channel, the scan will stop and resume after about 5 seconds. The other is “DUAL WATCH”. This allows you to monitor the active channel and one of the fifteen available channels.

Busy Channel Scan:

1. Press and release the “F” button (9) twice, the “SCAN” icon will begin flashing in the lower center of the display.
2. Press and release the “\” or “/” button to activate scan. The unit will now begin scanning the active channels.
 - ☞ Pressing the “PTT” (push to talk) button will cause the radio to stop scanning and return to normal operate mode.
 - ☞ When you enter the “program mode” with the “F” button the radio will go back to operate mode after about 8 seconds if no buttons are pressed.

Dual Watch

Dual watch is a function that allows you to scan the current active channel and one other channel.

1. Select the active channel.
2. Press the “F” button three times until “DW” is flashing in the top of the display.

3. Select the second channel to be scanned.
 - ☞ About 3 seconds after your selection of the second channel is complete the radio will begin switching between the two channels.
 - ☞ When the radio hears activity on either channel, scanning will stop on that channel for about 5 seconds and then resume scanning.
 - ☞ If communication is desired on the channel scanning stopped on, press the **“PTT”** button. This will deactivate Dual Watch and allow you to communicate normally.
4. To reactivate Dual Watch repeat steps above.

ACTIVATING “PRIVACY” CODES

To activate “CTCSS” codes

1. Press the “**F**” button to cause the small 0 or the icon “**CTCSS**” and small numbers displayed in the upper left of the display to flash.
2. Press and release the “**^**” or “**√**” buttons to select the “**CTCSS**” code you desire.
 - ☞ A code of “0” means no code is programmed.
 - ☞ You must do this for each of the channels you want **CTCSS** codes on.
 - ☞ Activating the “**CTCSS**” code will prevent you from hearing any conversation that is not using the same “**CTCSS**” code. This does not make your conversation private.

The following is a list of frequencies of the CTCSS codes. Different brands of radios may use a different number code for the frequencies. For operation with other brands of radios the selected CTCSS frequency must match.

01=67.0 Hz	11=97.4 Hz	21=136.5 Hz	31=192.8 Hz
02=71.9 Hz	12=100.0 Hz	22=141.3 Hz	32=203.5 Hz
03=74.4 Hz	13=103.5 Hz	23=146.2 Hz	33=210.7 Hz
04=77.0 Hz	14=107.2 Hz	24=151.4 Hz	34=218.1 Hz
05=79.7 Hz	15=110.9 Hz	25=156.7 Hz	35=225.7 Hz
06=82.5 Hz	16=114.8 Hz	26=162.2 Hz	36=233.6 Hz
07=85.4 Hz	17=118.8 Hz	27=167.9 Hz	37=241.8 Hz
08=88.5 Hz	18=123.0 Hz	28=173.8 Hz	38=250.3 Hz
09=91.5 Hz	19=127.3 Hz	29=179.9 Hz	0=OFF
10=94.8 Hz	20=131.8 Hz	30=186.2 Hz	

RESETTING THE RADIO

If the radio stops responding to button presses or otherwise does not function properly in some cases the radio can be reset to restore normal operation.

To reset the radio: With the radio off, press and hold the “**F**” button and turn the radio on. Release the “**F**” button when the radio powers up. (see turning the radio on)

- ☞ This operation will reset the radio to factory settings.

TROUBLESHOOTING **PROBLEM**

SOLUTION

No Power	1. Check battery installation and/or replace batteries
Cannot Receive Messages	<ol style="list-style-type: none"> 1. Make sure the volume is set high enough. 2. Confirm the radios have the same channel and or CTCSS code settings. 3. Change your location, you may be out of range. 4. Install batteries properly or replace. 5. Buildings, obstructions, operating indoors or in vehicles may interfere with communication. Change your location. 6. Make sure the radio is not transmitting. This could be due to accessories not set properly.
Range is Short	<ol style="list-style-type: none"> 1. Operating the radio from a vehicle or from a metal building will decrease the range. If possible operate outside of vehicles or buildings. 2. Carrying the radio so that the antenna is very near the body will decrease the range. Hold the radio in the open for the best range. 3. Battery condition can affect range. Replace or recharge batteries.
Interference/Static	<ol style="list-style-type: none"> 1. Using the CTCSS should stop you from hearing interference from other users and computers. 2. Radios too close. Radios must be at least 5 feet apart. 3. Radios too far apart. Obstacles interfere with transmissions. Talk range is up to 5 miles in unobstructed, clear areas.
Cannot communicate with other models of FRS or GMRS radios.	<ol style="list-style-type: none"> 1. Refer to channel frequency list on page 17 to confirm that you are using the same frequency. 2. Refer to the CTCSS tone list on page 11 to confirm that you are using the same tone code.
Radio is not responding to button presses	<ol style="list-style-type: none"> 1. Make sure key lock is not on. See To lock the controls 2. Make sure radio is not transmitting. 3. Radio might need to be reset, See Resetting Radio. 4. Ensure accessory microphone is set properly (see Page 12).
Display is dim	1. Reposition or replace batteries.

Charger not functioning	<ol style="list-style-type: none"> 1. Charger pin is not properly in place. Check that charger is fully inserted into the jack on the bottom of the radio. If using the drop-in charger, check the contacts on the bottom of the radio they may require cleaning. 2. Ensure the outlet the charger is plugged into is functioning properly. 3. Check that the batteries are installed in the radio properly. 4. Remove batteries from the radio and try to charge separately.
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CARE OF RECHARGEABLE BATTERIES

ALWAYS DISPOSE OF BATTERIES PROPERLY

Always follow the battery manufactures recommendations for Charging and disposing of Ni-MH batteries.

The following is meant as general information regarding Ni-MH batteries.

1. Occasionally allow the batteries to fully discharge before recharging. The battery indicator showing less than two segments will indicate full discharge.
2. Always allow the battery to fully charge before using. This requires 10 hours with the approved charger.

Note: **Do not charge any type of alkaline batteries in this unit.**

SERVICE:

If you have a problem which you believe requires service, please call first and speak with a service technician. Many problems can be remedied over the phone without returning the unit for service.

If it ever becomes necessary to return your unit for service:

1. Pack the unit in its original box and packing.
2. Pack the original box in a suitable shipping carton. Improper packing will result in damage during shipment.
3. Include a photocopy of the bill of sale showing the date of purchase.
4. Include a brief description of the problem you are having.
5. Include a DAYTIME telephone number.
6. Include a money order or Visa or Master Card credit card number for \$7.50 to cover shipping and handling. No personal checks please.
7. You do not need to return accessory unless they maybe directly related to the problem.
8. This information must be included before Warranty Service can be considered. Failure to include these items will delay the repair of the radio until these items are received.

TECHNICAL SPECIFICATIONS*

GENERAL

Frequency range.....**462.5625-462.725 MHz**
Channels.....**22**
Modulation type..... **FM**
Antenna impedance**50 Ohm**
Loud-speaker.....**8 Ohm 0.5W**
Microphone.....**electronic type**
Power supply..... **4 AAA Ni-MH or Alkaline(4.8/6.0VDC)**
Alternate Power supply..... **3 AA Ni-Cad, Ni-MH or Alkaline(3.6/4.5VDC)**

RECEIVER

Sensitivity at 12dB Sinad.....**0.3 μ V**
Selectivity.....**50 dB**
Squelch range.....**Automatic**
Audio output power (6.0 Volt DC power).....**0.3W @ 8 Ohm (10% distortion)**
Distortion at 500 mV.....**7%**
Audio frequency response.....**400-2400 Hz**

TRANSMITTER

RF Output Power.High (Channels 1-7 & 15-22 only).....
.....**nominal 1000 mW @ 4.5VDC, 2 watts @ 6.0VDC**
RF Output Power.Low.....**nominal 300 mW @ 4.5VDC, 500 mW @ 6.0VDC**
Frequency Tolerance..... **0.0005%**
Harmonic Suppression.....**more than 50 dB**
Modulation.....**FM +/- 4.0 kHz**

***Specifications are nominal and subject to change**

CHANNEL FREQUENCIES (MHz)

Channels 1 through 7 and 15 through 22 are GMRS channels. A license is required for operation on these frequencies.

01=462.5625 F+G	07=462.7125 F+G	13=467.6875 F	19=462.650 G
02=462.5875 F+G	08=467.5625 F	14=467.7125 F	20=462.675*
03=462.6125 F+G	09=467.5875 F	15=462.550 G	21=462.700 G
04=462.6375 F+G	10=467.6125 F	16=462.575 G	22=462.725 G
05=462.6625 F+G	11=467.6375 F	17=462.600 G	
06=462.6875 F+G	12=467.6625 F	18=462.625 G	

*** GMRS emergency channel 462.675MHz.**

LIMITED WARRANTY

Midland Radio Corporation will repair or replace, at its option without charge, any Midland FRS transceiver which fails due to a defect in material or workmanship within ONE YEAR following the initial consumer purchase.

This warranty does not include any carrying cases, earphones, or antennas, which may be a part of or included with the warranted product.

Performance of any obligation under this warranty may be obtained by returning the warranted product, freight prepaid, along with proof of purchase date, to Midland Radio Corporation, Warranty Service Department, 1120 Clay St., Kansas City, Missouri 64116.

Warranty information may be obtained by writing Midland Radio Corporation, Warranty Service Department at the above address.

This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state.

Note: The above warranty applies only to merchandise purchased in the United States of America or any of the territories or possessions thereof, or from a U.S. Military exchange.

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