

APPENDIX 5
OPERATING INSTRUCTIONS

TWENTY-SIX (26) PAGE OPERATING INSTRUCTIONS
FOLLOW THIS SHEET

OPERATING INSTRUCTIONS
FCC ID: MGPGR-1000

APPENDIX 5

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■ INTRODUCTION

Congratulations on your purchase of the CHEROKEE™ GR-1000 General Mobile Radio Service (GMRS) Portable Radio. Your CHEROKEE™ radio is designed to provide trouble-free service and advanced user features to make it the premier choice in radio communications.

■ THE GENERAL MOBILE RADIO SERVICE (GMRS)

The Federal Communications Commission (FCC) has created the GMRS for the short distance two-way communications needs of a licensed individual (18 years of age or older) and their immediate family members. The communication range is 5 to 25 miles depending on the equipment and location. Each Licensee manages a system consisting of one or more stations.

For license application, call the FCC hotline at 1-888-CALL-FCC (1-888-225-5322) or e-mail to callctr@nightwind.fcc.gov. For application forms, call 1-800-418-FORM (1-800-418-3676) and ask for forms 574 and 159.

Licenses could also be filed electronically in the near future using Form 605. Please visit the Universal Licensing System web site at www.fcc.gov/wtb/uls.

■ GENERAL FEATURES OF THE GR-1000

- 15 simplex channels, Auto or Standard bandwidth selection.
- Compact size and light weight
- Easy viewing multi purpose back lit LCD display
- CPU controlled frequency synthesizer for reliable operation
- 47 CTCSS Tone Squelch system to avoid listening to interference
- Advanced user features – Scan, memory, dual watch, incoming call alert...
- Optional features – Vibrator to indicate incoming calls.
- Operates on 1200mAh Ni-Mh Rechargeable Pack or 7.2V DC Power.
- Connector for external Microphone, Loudspeaker and DC power supply
- Belt Clip and hand strap for easy carrying
- Detachable antenna for external antenna connection

□ TO RECEIVE

If you have just transmitted, then release the "PTT" button. If you have not transmitted, just leave the radio on to receive on your selected channel.

The radio will unmute upon receiving a signal. The BUSY icon will appear on the LCD and the S-RF meter will show the received signal strength.

When the radio is operated with CTCSS Tone Squelch (TSQ), and the radio receives a signal with correct CTCSS code, the CALL icon will also appear on the LCD display.

☐ TO TRANSMIT

Press and Hold the "PTT" button to transmit. With 2 Watts output power, the GR1000 could communicate direct with a similar unit for a range of up to 5 miles depending on location. The communication range would increase when a matching external antenna is used.

- A. If Busy Channel Lock Out Option is on and the radio is in the receiving mode, Busy Lock Error Message will appear on the LCD and the radio will stay in receiving mode and you will not be able to transmit.
- B. If Time-Out-Time option is on, the continuous transmitting time will be limited by the time set in this option.

NOTE: Please refer to the different sections in this manual for detail operation procedures for advanced features.

!! WARNING !!

Replacement or substitution of antenna, transistors, regular diodes or other parts of a unique nature, with parts other than those recommended by Cherokee Electronics, may cause violation of the technical regulations of Part 95 of the FCC Rules, or violation of Type Acceptance requirements of Part 2 of the Rules.

LICENSING

The user must obtain a license for a GMRS system before he could transmit on any GMRS channel in the United States.

For license application, call the FCC hotline at 1-888-CALL-FCC (1-888-225-5322) or e-mail to callctr@nightwind.fcc.gov. For application forms, call 1-800-418-FORM (1-800-418-3676) and ask for forms 574 and 159.

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12. d2 (Dot No. 2)

This dot is used when displaying the "CTCSS" Frequency. (Unit : Hz)

13. d1 (Dot No. 1)

This dot is used when displaying the "Frequency". (Unit : MHz)

14. Channel (Frequency) Indicator

Display the channel number or the frequency in which the radio is operating. When operating on channel 1, if you select channel number display, CH-01 will appear on the LCD. If you select frequency display, 7 digit frequency 462.5625 will be displayed.

15. Signal/RF output meter

The radio incorporates a ten segment received signal strength and transmit meter in the LCD. When receiving a signal, the meter will indicate how strong the signal is. One or two segments will indicate a weak signal, while a very strong signal will have 8 to 10 segments. When transmitting, the letter "TX" will appear on the LCD and all 10 segments will appear on the LCD.

16. Battery remainder level meter

You could view the battery level while loading the battery for transmit by pressing PTT while holding down the MO button. "BATT" icon will appear on the LCD and the 10 segment Signal Meter indicates the battery level from 1 (Low) to 10 (Full).

17. " " (Battery Low Indicator)

Indicates batteries level. "  " icon indicates a full battery condition and when the battery level becomes low, the indicator will show "  " and flashing, indicating that the battery needs to be replaced or recharged.

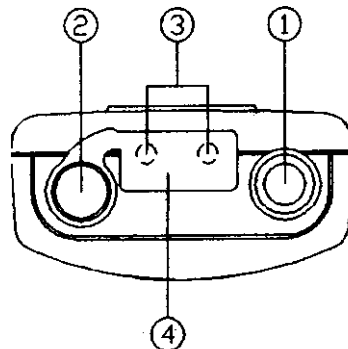
18. CALL

Indicates that a call is received with correct CTCSS code in the CTCSS Tone Squelch operation.

19. BUSY

Indicates that a RF signal is received.

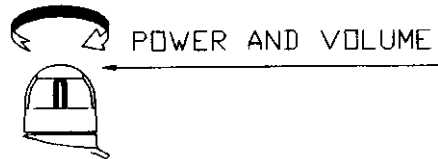
☐ **Top Panel Features**



1. Power On/Off, Volume Control

Turn the Volume control clockwise to switch power on and set volume to desired level. Turn the Volume control counter-clockwise to turn power off.

<Power Switch and Volume Control>



2. Antenna

The radio is equipped with a SMA female antenna connector and a matching UHF antenna. The user could replace the stock antenna with an optional mobile antenna when using the radio inside a car, or a base antenna in a fixed location.

3. Microphone and Speaker Jack

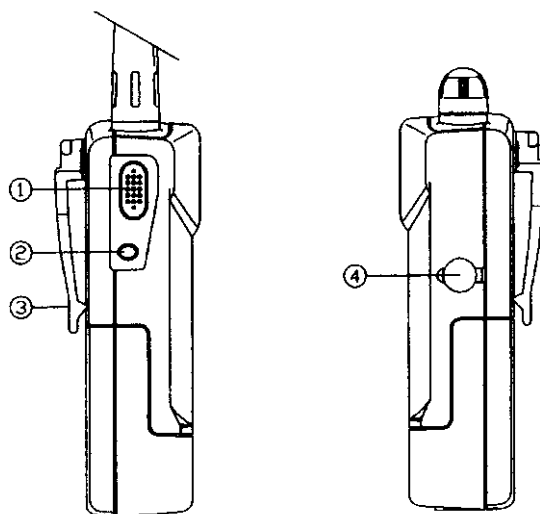
The jacks are for connection of optional speaker microphone accessories. Since BTL(Bridge Tied Load) Audio Amplifier is used in this radio, Authentic Cherokee Accessories with floated ground on the loudspeaker wires shall be used.

NOTE : If you use an External Speaker/MIC with ground circuits common for both microphone and loudspeaker with this radio, the radio's BTL Audio Circuit would be overloaded and becomes damaged over time. We therefore recommend you to use Cherokee's External Speaker/MIC. If you want to use External Speaker/MIC from other suppliers, make sure that you get one with correct wiring connections.

4. Dust Cover

When External Speaker/MIC are not being used, this rubber cover prevents dirt and moisture from getting to the inside of the radio. For radios with WP option, the rubber cover must remain plugged in tight to avoid water ingress.

□ Side and Back Panel Features



**The drawing shows a GR1000 radio with an optional "AAA" battery case.

1. PTT(Push-To-Talk) Button

Press the "PTT" button to activate the transmitter : Talk in a normal voice about 2-3 inches from the internal microphone. When external microphone is connected, the external PTT control activates the external microphone and the PTT control on the radio activates the internal microphone. To receive, just release the "PTT" button.

2. Function(FUNC) button

The function button activates the secondary function of the front panel buttons. Press and hold the "FUNC" button and then press the front panel button to access the secondary function.

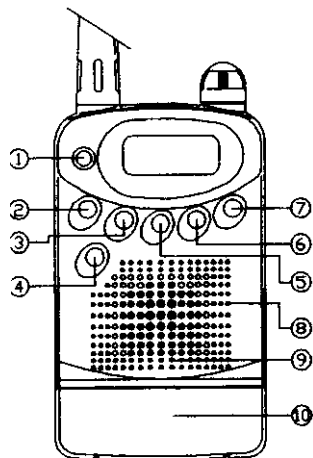
3. Belt Clip

Allows the user to attach the radio to the belt, shirt pocket, on the side window of the car... etc

4. DC Jack

For connection to optional AC Wall Charger, or Car Cigarette Lighter DC Power Supply Adapter. Do not connect charger or power supply to the radio if you are using Alkaline Batteries.

□ Front Panel Features



**The drawing shows a GR1000 radio with an optional "AAA" battery case.

1. "MO", "Fr/Ch" Button

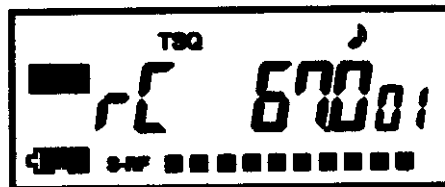
1) MO(Monitor)

Press and hold the "MO(Monitor)" button in the receiving mode, both carrier and tone squelch circuit will be temporarily disabled and the receiver noise will appear on the loudspeaker until the "MO" button will be released.

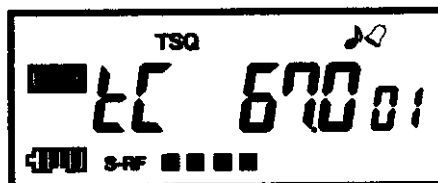
You can listen to a signal with incorrect CTCSS code is received during CTCSS operation by pressing and holding the "MO" button.

You can also check the status of the TX and RX CTCSS tone squelch setting and the Scan Skip setting of the radio by press and holding the "MO" button for more than one second. The settings will flash on the LCD one by one, each last for 1 second. The LCD will revert to display channel numbers after completing the sequence.

□ Display of RX Tone.



- ☐ Display of TX Tone.



- ☐ Display of SCAN Skip Condition.



2) Fr/Ch (Selection of Frequency or Channel Number Display)

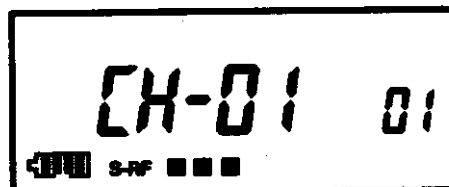
If you press the "FUNC + MO(Fr/Ch)" button when Frequency is displayed on the LCD, Channel No. will appear on the LCD. Press the "FUNC + MO(Fr/Ch)" button once again and the Frequency will be displayed

- ☐ Display of Frequency(RX/TX Channel).



The last 2 small digits indicate channel number, and the 7 big digits indicate RX/TX frequency

- ☐ Display of Channel(RX/TX Channel)



Both the small and big digit display indicate RX/TX channel number.

2. Channel Down(▼) Button

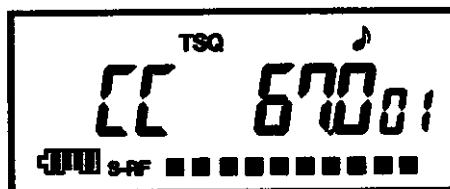
1) Channel Down(▼) button

Press the "▼" button to change the radio to operate on a lower Channel Number than is currently shown on the LCD.

2) TONE Selection Button

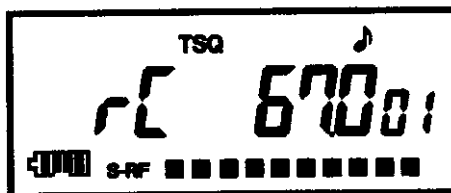
Press "FUNC + ▼" button in the receiving to enter the Channel RX/TX Tone Squelch setting mode (Note: This selection is not available when the radio is in Scan or Dual Watch Mode)

☐ Display of CTCSS RX/TX Common Tone setting mode



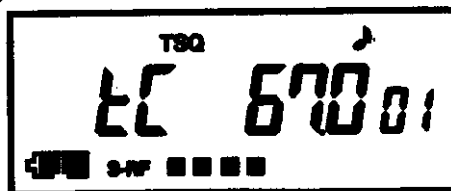
In the above condition, press the "FUNC + ▲ or ▼" button to change to display the RX Tone setting mode. (Note: the tone code number will replace The tone frequency displayed if channel number display is selected by operating the "FUNC" "MO" buttons while the radio is in receive mode)

☐ Display of CTCSS RX Tone setting mode



In the above condition, press the "FUNC + ▲ or ▼" button to change to display the TX Tone setting mode.

☐ Display of CTCSS TX Tone setting mode



In the above condition, press the "FUNC + ▲ or ▼" button to change back to display the Common Tone setting mode.

When Common Tone is selected, the radio will apply the selected CTCSS tone

on both TX and RX operation. Common Tone is the preferred and basic mode of operation.

The user could also choose different TX and RX CTCSS tones to perform special and advanced operation – Such as group calls and enhanced scanning...etc. Just remember to enter the correct CTCSS code on both TX and RX CTCSS Tone setting menus respectively.

When the radio is displaying the CTCSS code, pressing the "▲ or ▼" button will increase or decrease the Tone Frequency or Tone Channel No. If you press and hold the "▲ or ▼" button for more than one second, Tone Frequency or Tone Channel No. will scroll at a fast rate.

When the radio displays the CTCSS code you desired to use, you could change to display another CTCSS Tone setting menu by pressing "FUNC" and "UP/DN" buttons. After all the settings are completed, press PTT button to confirm your selections. The selected contents will then be stored and the radio will revert to normal operation. You could then activate Tone Squelch operation by pressing "FUNC" and "DN" buttons.

3. Channel Up(▲) Button

1) Channel Up(▲) button

Press the "▲" button to arrow to move to a higher Channel than is currently shown on the LCD.

2) TONE ON/OFF Button

Press the "FUNC + ▲" button while in the receiving mode to toggle the Tone Squelch ON and OFF (not available in Scan/Dual Watch Mode). "TSQ" icon will appear on the LCD when Tone Squelch is switched ON.

NOTE: In Tone Squelch operation, the loudspeaker of the receiver will only become active while the received signal has the same CTCSS code as the one selected in the RX CTCSS Tone setting menu. Although you could not hear interference or transmissions from other users, they could still exist and may reduce your communication range. It is always a good practice to monitor the channel using the "MO" button, to ensure that it is free of interference before you choose it for communications. Also, transmission in CTCSS is not protected and is subject to monitoring by other users using the same radio channel.

4. ☼ (Lamp) Button

1) ☼ (Lamp) Button

Press the "☼" button, the lamp will stay on for four seconds, after which it will turn itself off automatically. If you press another button on the front cabinet when the lamp is on, the lamp will stay on for four more seconds. If you press the "☼" button for more than one second, the lamp will stay on until you press the "☼" button once again.

2) Beep Button

This feature gives the user an audible test tone sequence while turning the radio on, and short confirmation or error tones when the user presses a button

on the radio (Except for PTT and "MO" buttons).
Press "FUNC + LAMP" button to switch the "Beep" on and off.

The confirmation tone is a high pitch tone indicating that the button selection is accepted. The error tone is a low pitch tone indicating that the button selection is rejected due to incorrect key entry sequences or the feature requested is not compatible with currently selected operating mode.

5. MEMORY READING, WRITING AND DELETING

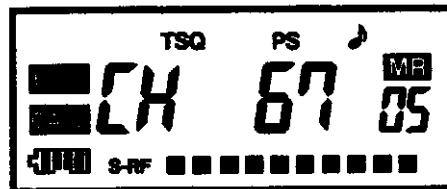
1) MEMORY CHANNEL READING

This feature allows the user to check the contents of the 10 memory channel locations, and stay on any of the memory channels for operation. To enter the memory channel reading mode, press the "MR" button. The last used Memory channel will appear on the LCD together with the "MR" icon. You can then scroll through other memory channels by using "▲" or "▼" buttons. Empty memory channels will not be displayed when "▲" or "▼" button is operating.

When a memory channel is displayed, the radio will operate on that channel with all the parameters stored (Frequency, TSQ...etc.). Press the "MR" button again to exit the memory reading mode. The "MR" icon will disappear and the channel display is reverting to show the normal channel last used.

When all memory channels locations are empty, "EMPTY" message will be displayed and the unit will return to normal channel display mode automatically.

☐ Display of Memory channel



☐ Display of the "EMPTY" message

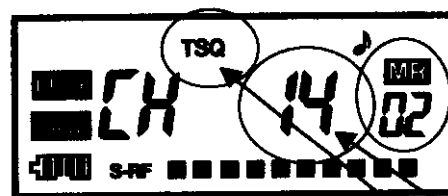


2) MEMORY CHANNEL WRITING

This feature allows the user to store a normal operating channel to a memory channel.

Select the channel by using "▲ or ▼" button in normal receive mode, select tone squelch settings if needed, then press the "FUNC + MR" buttons to scroll through all the empty memory channel displayed on the small channel indicators. Note that the "MR" icon and the small channel display flashes. Stop scrolling when you have reached the desired memory channel location and press PTT to store the channel settings into the memory channel. After the memory store operation, the radio will revert to memory channel reading mode on the memory channel that you have just entered. Press "MR" button again if you want to exit to normal operation

□ Display of memory writing status



Memory channel and "MR" icon display and blinking

Selected normal channel with Tone Squelch

3) MEMORY CHANNEL DELETING

Memory channel deleting is possible only in the memory channel reading mode ("MR" icon display status not blinking status).

To delete the memory channel,

First, select the memory channel to be deleted by using "▲ or ▼" button.

Second, press the "FUNC + MR" button more than 1.5 second.

The "DELETE" message will be displayed on the LCD and the memory channel is erased.

When all memory channels are deleted, the "EMPTY" message will be displayed and the "MR" icon will disappear. The radio will then revert to normal channel display mode.

Display of memory channels deleting – when a memory channel is deleted



6. "SC" Button

1) SC(SCAN) Button

This feature allow the user to scan all the 15 GRMS channels for activities. Tone squelch preset on each channel by the user will be utilized during scan operation. Scan will not work when the radio is in the Tone Frequency Setting or Dual Watch modes.

Press the "SC" button to start scanning. The radio will stop on any busy channel. It will remain on that busy channel until the preset Scan Delay Timer expires, it will revert to scanning after then. D1 (dot1) on the LCD will blink every 0.5 seconds when the Scan Delay Timer is active. The user could cancel scanning by pressing the PTT while the radio stops at a busy channel, and communicate with other users using that channel.

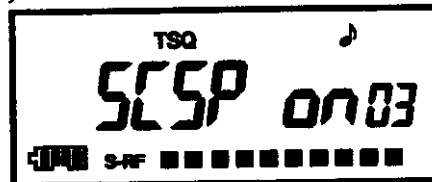
Other Scan associated features:

- Pressing the "A/V" button while the radio is scanning will change the direction of scan between ascending and descending.
- During Tone Squelch operation, the radio will not stop on the busy channel if the received signal does not have a matched CTCSS code.

Scan Skip feature:

- When the user presses the "FUNC" button while the radio stopped scanning on a busy channel, the channel will be deleted from its future scans. The deleted channel will be recovered after the radio is turned off and back on.

☐ Display of SCAN SKIP message



During normal operation, the user could check on any channel to see whether they were deleted from the scan during previous scanning operation by press and hold the "MO" button. The Scan Skip message will appear following the Tone Squelch status display. SCSP ON meaning the channel has already been deleted from the last scanning operation. The deleted channel will be recovered after the radio is turned off and back on.

When the user tries to skip the last remaining channel after all other channels are deleted, the scanning process will stop and "EMPTY" message will appear on the LCD. Further pressing the "SC" button will result in error tone and the frequency last scanned or last selected will stay on the LCD display.

☐ Display of EMPTY message

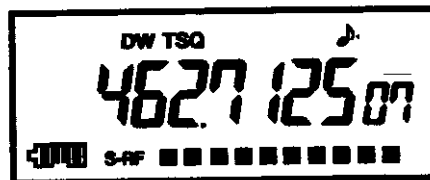


2) Dual Watch Operation

Dual Watch allows the user to monitor another channel (A) while standing by on its normal operating channel (B). Dual Watch cannot operate while the radio is under Tone Frequency Setting, Memory or Scan Mode.

-First select the channel in which you want to monitor, which we will refer to as Channel (A). Press the "FUNC + SC" button, "DW" will appear on the LCD. Select the Channel B using the "A/√" button. Once Channel B has been selected, the radio will enter the Dual Watch mode.

☐ Display of Dual Watch Feature.



To turn off the "Dual Watch" Channel, simply press the 'FUNC + SC' or press the "PTT" button. Note that the radio will return to the "B" channel for normal operation.

If you press the "FUNC + SC" button or press the "PTT" button when a signal is receiving on the channel "A" or "B", the Dual Watch feature will be turn off on the "A" or "B".

The use could use the "A or √" buttons to change its normal operating channel while remain monitoring Channel A in Dual Watch. The radio will always transmit on Channel B while PTT is depressed.

7. "C" Button

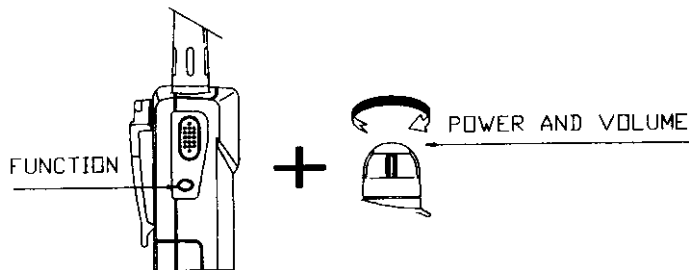
1) C (Call) Button

The Call button allows the user to access to a preset channel by touching only one button.

Preset – Select the channel the call button operates. Press "FUNC" and "MR" button to enter memory write mode, then press "C" button for 1.5 seconds to store the channel into the call memory. Touch "C" button again to revert to normal operation.

☐ OPTION SETTING MODE

The following procedure allows the user to access option feature settings. To enter option setting mode, first turn off the radio, then press and hold "FUNC" button while turning on the radio. Press "FUNC + ▲ or ▼" button to scroll through all the options.



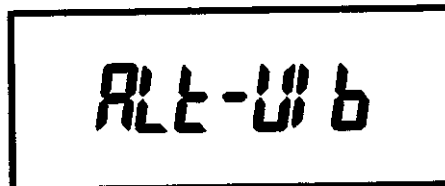
NOTE : While you are in the option setting mode,

- A. If you hold "FUNC" button and then press "▲ or ▼" button, the next(previous) option setting mode will appear on the LCD.
- B. If you press the "PTT" button, all changed contents will be stored and the radio will return for normal operation.
- C. Other buttons located on the front of the radio will not operate. If you press these buttons, error beep tone will sound.

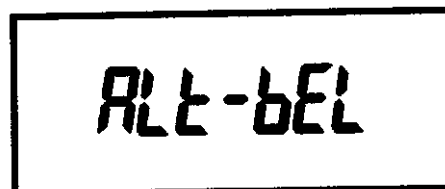
1. Select of Melody (Bell) or Vibrator Alert for Incoming Calls

The first selection displayed in the option setting menu is Melody (Bell) or Vibrator Alert.

☐ Display of Vibrator Alert setting Mode.



☐ Display of Melody (Bell) Alert setting Mode.



Press "▲ or ▼" button to change between Vibrator and Melody Alert.

Note: Vibrator is only available in the radios fitted with vibrator option.

2. Setting of Power Save mode

This feature enables power save circuit in the radio to reduce battery power consumption and increase the useful life of your battery significantly when no signal is received during normal receive standby mode.

- ☐ Display of Power save On/Off setting Mode.



Press "▲ or ▼" button to toggle power save On and Off. The "PS" icon on the LCD will appear when power save option is On. The icon will flash when the power save circuit is in operation during normal receive standby mode.

3. Band Width Control

This feature allows the user to select the bandwidth that the radio operates. 25KHz bandwidth is standard for GMRS operation. GR1000 also allows the user to choose Automatic Bandwidth operation, which will put the radio on 12.5KHz bandwidth on the interstitial channels (Ch 1 to 7) and 25KHz bandwidth on normal GMRS channels (Ch A1 to A8).

- ☐ Display of radio operating under Automatic Bandwidth Operation



- ☐ Display of radio operating under Standard 25KHz Bandwidth Operation



Press "▲ or ▼" button to toggle bandwidth selection between "Auto" and "2500" (25KHz).

4. SCAN Delay Time

This feature allows the radio to stop on a busy channel during scanning operation for a preset period of time of 1 to 30 seconds (The default setting is 5 seconds), scanning will resume after the time expires.

☐ Display of SCAN Delay Time Mode

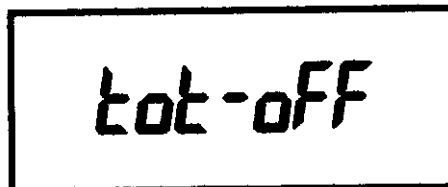


Press the "▲ or ▼" button to change the scan delay timer between 1 to 30 seconds in 1 second steps.

5. Setting of Time-Out-Timer

This feature allows the user to limit the maximum talk time for each transmission. If the PTT is depressed for a period exceeding the Timer out Timer, the transmitter will be cut off and the user has to release and press the PTT again to transmit.

☐ Display of Time-Out-Time setting mode.

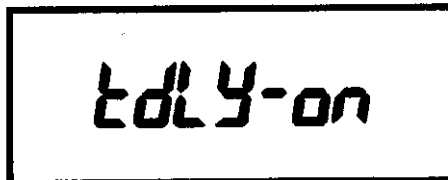


To change the timer setting, press the "▲ or ▼" button.

6. Setting of TX Delay Option

In CTCSS Tone Squelch operation, this feature prevents "Squelch tail" being received by other users when the "PTT" button is released.

- ☐ Display of TX Delay Option Setting Mode.



Press "A or v" button to toggle TX Delay option between On and Off.

7. Setting of Busy Channel Lock Out

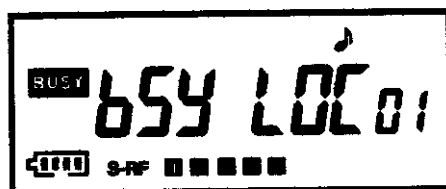
This allows the user to disable the transmitter while receiving a message from others. This will avoid interference on the radio channel.

- ☐ Display of Busy Channel Lock Out Setting Mode.



Press "A or v" button to toggle Busy Channel Lock Out option between On and Off.

NOTE : If you press "PTT" button while operating in Busy Channel Lock Out mode (When receiving a signal), error message (BSY LOC) will appear on the LCD and the radio will stay in the receiving mode.



Use - Press the "C" button to go directly to the call channel while the radio is in the receiving mode, including Memory channel mode, Scan Mode and Dual Watch operations. Press "C" button again to go back to normal operation.

- Display of Call channel No.(Frequency)



2) LOCK Function

This feature allows the user to lock the operation of "Channel Up/Dn", "MR", "SC" and "C" button selections. An error tone will be heard and the operation is denied when the user press those buttons after the radio is being locked.

To Activate : Press the "FUNC + C" button. The "On" icon will appear on the LCD to indicate that this feature is currently activated.

To De-Activate : Press the "FUNC + C" button again to unlock. The "On" icon will disappear from the LCD.

8. Internal Microphone

Front mounted, electrostatic condenser microphone to provide clear high quality audio transmission. For best results, hold the radio 2-4 inches from your mouth and speak in a normal voice.

9. Loudspeaker

High quality, impact resistant output loudspeaker, to provide clear and high volume reception.

10. Battery Case

See "Battery Installation Instruction" for details.(Page 18)

■ BELL / VIBRATOR FEATURE

Function: The user is alerted of incoming calls by Bell Indicator and an audible tone, or by a Vibrator unit installed inside the radio.

To Activate:

After selecting the Bell or the Vibrator as the device for alert operation in the option setting mode, press the "FUNC+PTT" buttons to activate the feature. The Bell icon "🔔" or Vibrator icon "🔊" will appear on the LCD.

Upon receiving an incoming call, the selected alert function (Bell or Vibrator) will be activated for about 8 seconds and then stopped for 15 seconds. Any incoming calls received during the 15 seconds will not trigger the alert device. The Bell or Vibrator icon on the LCD will blink, indicating that a call has been received. The radio will automatically re-armed and ready for another alert after the 15 second timer expires.

The user could restore the flashing Bell/Vibrator icons by pressing the "FUNC+PTT" buttons, ready to register for another incoming call.

To De-activate:

Press the PTT button and the Bell or Vibrator feature is de-activated. The Bell or Vibrator icon will disappear from the LCD.

■ RADIO CLONING FUNCTION

The user could use this function to copy the user defined option settings, tone squelch settings and memory channel settings from one FR465+ radio to another using the option Cloning Cables.

Insert the two cloning cables to the Ext. Mic and Speaker Jacks of the Master Unit (the one which provides the setting data) and the Slave Unit (the one which accepts the setting data)

To enter cloning mode --

Master Unit - Turn off the radio, turn the radio on while holding "FUNC+ ⓪" buttons. The LCD will display "Clone" for 1 second and then "MASTER"

Slave Unit - Turn off the radio, turn the radio on while holding "FUNC + ⓧ" buttons. The LCD will display "Clone" for 1 second and then "Slave"

Press the "MO" button on the Master unit to start data transfer. Observe that the LCD display will change to "Send" in Master Unit and "Receive" in Slave Unit. The transfer will take about 20-30 seconds.

When the transfer is completed, both radio will display "good" on the LCD. The display of master unit will revert to "Master" and the slave unit will reset and revert to normal operation.

The user could then remove the Cloning Cable from the slave unit, and

prepare another slave unit for cloning using the procedure above. When the Slave Unit is ready (showing "Slave" on the LCD). Press "MO" button of the Master unit to start data transfer.

The Master Unit can be reset by turning off the power.

■ SPECIAL TEST FEATURES

POWER ON SELF TEST

Press and hold the "MO" button while turning the power on will put the radio into self-checking mode. It will display all the icons and digits on the display and turn on the vibrator (if fitted) momentary.

Press PTT button will put the radio back to normal operation. Press any other button will put the radio into buttons checking mode, it will display "PRESS Dn" to instruct you to press the "f" button. Follow the instructions until you have pressed all the buttons (except PTT). The radio will display "good" and then revert to normal operation.

INITIALIZATION

Press and hold the "FUNC" and "MO" buttons while turning the power on will put the radio into initialization mode. The radio will display "Initial" and then "Pass" to indicate that all the user settings in the memory are reset to original factory settings. This feature is useful when you have mis-programmed the radio and the radio is not operating normally, or when there is an error in the memory, which needs to be erased and corrected.

■ GR1000 CHANNEL FREQUENCY TABLE

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	462.5625	A1	462.575
2	462.5875	A2	462.625
3	462.6125	A3	462.675
4	462.6375	A4	462.725
5	462.6625	A5	462.550
6	462.6875	A6	462.600
7	462.7125	A7	462.650
		A8	462.700

**Channels 1 to 7 are interstitial frequencies shared with Family Radio Service (FRS).

□ CTCSS TONE TABLE

NO.	FREQ(Hz)	NO.	FREQ(Hz)	NO.	FREQ(Hz)
1	67.0	17	114.8	33	186.2
2	69.3	18	118.8	34	189.9
3	71.9	19	123.0	35	192.8
4	74.4	20	127.3	36	196.6
5	77.0	21	131.8	37	199.5
6	79.7	22	136.5	38	203.5
7	82.5	23	141.3	39	206.5
8	85.4	24	146.2	40	210.7
9	88.5	25	151.4	41	218.1
10	91.5	26	156.7	42	225.7
11	94.8	27	159.8	43	229.1
12	97.4	28	162.2	44	233.6
13	100.0	29	167.9	45	241.8
14	103.5	30	173.8	46	250.3
15	107.2	31	179.9	47	254.1
16	110.9	32	183.5	48	NO TONE

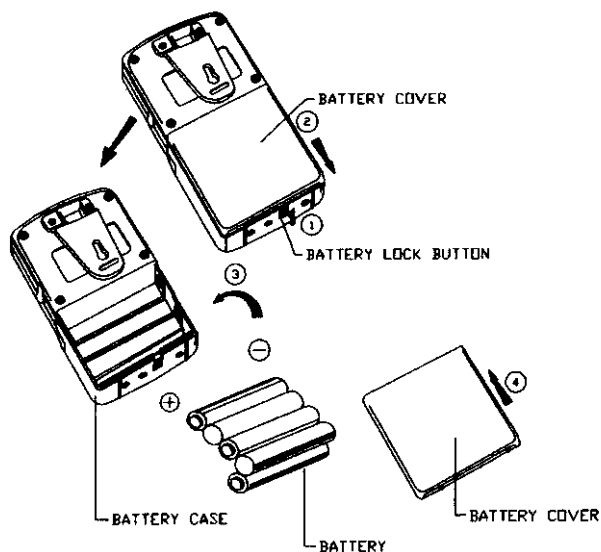
BATTERY INSTALLATION INSTRUCTIONS

1. Press down the battery lock button on the bottom side of the radio to unlatch the lock. (1)
2. Slide open the battery cover on the back side of the radio towards the indicated direction. (2)
3. Install the battery as the indicated arrangement (3) Please note the polarity of the batteries. For Rechargeable pack, please note the "This Side Up" Label and position the battery correctly before inserting into the radio.
4. Put the battery cover back on the radio. Press and slide to close (4).
5. Press the battery lock button upward to lock the battery case.

If you have installed rechargeable batteries, or used the Cherokee NiMh rechargeable pack, you could use the optional DC wall charge adapter, desktop charger or car cigarette lighter DC adapter to charge the batteries.

NOTE: Alkaline RENEWABLE batteries are NOT regular rechargeable batteries. It requires special battery charger to recharge.

WARNING: DO NOT CHARGE ANY BATTERIES OTHER THAN NiCd OR NiMH RECHARGEABLE TYPES IN THE RADIO. CHARGING BATTERIES INCORRECTLY WILL RESULT IN EXPLOSION AND CAUSE SERIOUS DAMAGE TO THE RADIO AND ITS OPERATOR.



****This drawing shows GR-1000 with optional "AAA" Alkaline Battery Case**

☐ SPECIFICATIONS

1. GENERAL

CHANNEL _____ 15 GMRS CHANNELS
TONE SQUELCH (CTCSS) _____ 47 CTCSS CODES
FREQUENCY _____ 462.550MHz to 462.725MHz
FREQUENCY GENERATION _____ PLL SYNTHESIZER
FREQUENCY STABILITY _____ +/- 5ppm
OPERATING TEMPERATURE _____ -20°C TO +60°C
POWER SOURCE _____ DC POWER SUPPLY / BATTERIES
STANDARD - 6x"AA" NiMH 1200mAh RECHARGEABLE
OPTION -DC7.2V WALL CHARGER OR CAR PLUG
OPTION -6x"AAA" NiMH 500mAh RECHARGEABLE
OPTION -5x"AAA" ALKALINE BATTERIES
MODULATION _____ FREQUENCY MODULATION (F3E)
ANTENNA IMPEDANCE _____ 50 ohms
DIMENSIONS _____ 58(W) x 143.5(H) x 26.5(D)mm
WEIGHT _____ 136g WITH OUT BATTERY

2. RECEIVER SECTION

CIRCUIT TYPE _____ DUAL CONVERSION
SUPERHETERODYNE FM
IF FREQUENCY _____ 1st IF:21.4MHz 2nd IF:455KHz
SENSITIVITY _____ 0.25uV FOR 12dB SINAD
CHANNEL BANDWIDTH _____ 12.5KHz AND 25KHz AUTO SELECT
OR 25KHz FOR ALL CHANNELS
SELECTIVITY _____ 50dB Min.
SPURIOUS & IMAGE REJECTION _____ 40dB Min
INTER MODULATION DISTORTION _____ 50dB Min
S/N RATIO (WITH CCITT) _____ 40dB Min
AUDIO OUTPUT @10%THD _____ 500mW 16 Ω , BTL

3. TRANSMITTER SECTION

POWER OUTPUT _____ 2 Watts
DISTORTION _____ 5%
DEVIATION _____ +/- 5KHz
S/N RATIO (WITH CCITT) _____ 40dB
CURRENT DRAIN _____ 750mA Max

WIRELESS MARKETING CORPORATION

1212 REMINGTON ROAD
SCHAUMBURG
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USA

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APPENDIX 6
TRANSMITTER ALIGNMENT

TWO (2) PAGE ALIGNMENT INSTRUCTIONS FOLLOW THIS SHEET

TRANSMITTER TUNE-UP PROCEDURE
FCC ID: MGPGR-1000

APPENDIX 6

TRANSMITTER ALIGNMENT

Following are the summary of Transmitter Alignment Procedures from the Service Manual. Please refer to the Service Manual for Test Equipment requirements and connection diagrams:

TRANSMITTER SECTION

STEP	SETTING	CONNECTION	ADJUST	ADJUST FOR
1	RF Power stage ; Mode : Transmit Volume : Optional CH Selector : A1	Connect dummy load and RF power meter to the external ANT-jack on the Set (Figure-2)	RV-101	Adjust for max. indication on the power meter($2.0 \pm 0.2W$)
2	Second harmonic check ; Mode : Transmit Volume : Optional CH Selector : A1	Connect RF power meter with dummy load to spectrum analyzer through coupler/-40dB atten. to EXT-ANT. Jack on the set (Figure-3).		At no modulation, compare the level of fundamental freq-spectrum to the level of harmonic freq-spectrum. Suppression of the 2nd harmonic Freq. level must be lower than 60dB. Check for the other channel's
3	Frequency check ; Mode : Transmit Volume : Optional CH Selector : A1	Connect dummy load and frequency counter through coupler to RF power meter. Also connect power meter to EXT-ANT. jack on the set. (Figure-4)	CRYSTAL	Make sure that the indication of the transmitter freq. is $462.575MHz \pm 5PPM$ on the frequency counter.
4	MAX deviation check ; Mode : Transmit Volume : Optional CTCSS : OFF CH Selector : A1 Modulation: 1KHz -20dBm audio	Connect dummy load and modulation meter through coupler to RF power meter. Also connect power meter to EXT-ANT. jack on the set. (Figure-6)	RV-401	adjust RV-802 so that the indication of the modulation analyzer is $4.3 \pm 0.2KHz$.

5	Tone Level set ; Mode : Transmit Volume : Optional CTCSS : ON – Code 10 CH Selector : 1 Modulation: 1KHz –20dBm audio	Connect dummy load and modulation meter through coupler to RF power meter. Also connect power Meter to EXT-ANT. jack on the set. (Figure-6)	RV-803	adjust RV-803 so that the indication of the modulation analyzer is $4.6 \pm 0.2\text{KHz}$.
6	Tone Balance set ; Mode : Transmit Volume : Optional CTCSS : ON – Code 10 CH Selector : 1 Modulation: NO Modulation	Connect dummy load and modulation meter through coupler to RF power meter. Also connect power Meter to EXT-ANT. jack on the set. (Figure-6)	RV-801	adjust RV-801 for max level and lowest distortion CTCSS signal in square wave - as observed in the modulation scope

APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

THREE (3) PAGE CIRCUITS & DEVICES TO STABILIZE FREQUENCY
FOLLOWS THIS SHEET

CIRCUITS AND DEVICES TO
STABILIZE FREQUENCY
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APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

The operating frequency of the radio is generated by a Voltage Controlled Oscillator (VCO) controlled by a Phase Locked Loop (PLL) circuit. The reference frequency of the PLL comes from a 12.8MHz Temperature Compensated Crystal Oscillator TCXO and locks the VCO output to a frequency stability of +/-5ppm within the operating temperature range.

Text from the Technical Manual:

(1) INTRODUCTION

THE SYNTHESIZER CIRCUIT CONSISTS OF THE FOLLOWING COMPONENTS : PLL IC (IC103), VCTCXO (X102), VCO, VARICAP DIODE (D302)

IC103 IS A CMOS LSI THAT INCLUDES A PRESCALLER.

Q304, D302, C322, 318, 317, 319, L304 FORMED A CLAPP OSCILLATOR CIRCUIT TO OPERATE AS THE VCO FOR IC103.

Q305 IS A SWITCHING TRANSISTOR TO CONNECT OR DISCONNECT THE TUNING CAPACITOR IN THE VCO OSCILLATOR TANK CIRCUIT FOR TRANSMIT OR RECEIVE OPERATION.

Q303 WORKS AS A BUFFER AMP FOR RX LOCAL OSCILLATOR FREQUENCIES AND TX CARRIER FREQUENCIES.

(2) REFERENCE FREQUENCY

THE VOLTAGE CONTROLLED TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR, VCTCXO X102(12.80 [MHz]) AND OTHER COMPONENTS AT PIN.1 AND 16 OF IC103 PROVIDES THE REFERENCE FREQUENCY FOR THE PLL.

(3) VCO

Q304 AND SURROUNDING PARTS FORM A CLAPP OSCILLATOR VCO FOR IC103. WITH APPROPRIATE CONTROL VOLTAGE ON D302, THE VCO CAN OPERATE OVER THE REQUIRED RANGE OF 441.150 [MHz] TO 462.725 [MHz].

(4) PROGRAMMABLE DIVIDER AND ITS CONTROL

THE CHANNEL INFORMATION ARE MASK PROGRAMMED INTO THE CPU IC801. WHEN THE FRONT PANEL CHANNEL UP/DOWN KEYS ARE OPERATED, KEY MATRIX INPUT PINS 25 AND 28 ARE ASSERTED, THE CPU WOULD CONVERT THE SELECTION INTO APPROPRIATE DIVISION RATIO CODES. THE CODES ARE SENT SERIALLY TO THE PROGRAMMABLE DIVIDER OF THE PLL IC301 FOR GENERATION OF THE CORRECT CHANNEL FREQUENCIES.

AS THE PLL/VCO OUTPUT FREQUENCIES ARE DIFFERENT BETWEEN TRANSMIT AND RECEIVE OPERATION, THE CPU SENSES PTT STATUS THROUGH PIN 42. A DIGITAL HIGH AT PIN 4 INDICATES THE RADIO IS IN TRANSMIT MODE.

THE VCO FREQUENCY IS DIVIDED WITH THE CPU CONTROLLED DIVISION RATIO IN IC103. IT IS THEN FED TO THE PHASE DETECTOR FOR COMPARING AND PHASE LOCK WITH THE 6.25 KHz SIGNAL DEVRIVED FROM THE 12.8MHz REFERENCE FREQUENCY.

(5) PHASE DETECTOR AND VCO CONTROL

THE PHASE DETECTOR IS A DIGITAL PHASE COMPARATOR WHICH COMPARES THE PHASE OF THE REFERENCE SIGNAL WITH PROGRAMMABLE DIVIDER. THE DETECTOR OUTPUT IS A SERIES OF PULSES WHOSE WIDTH DEPENDS ON THE PHASE ERROR BETWEEN THE TWO SIGNALS. THE PHASE DETECTOR PULSE OUTPUT IS FED TO AN ACTIVE LOW PASS FILTER TO CONVERT THE PULSES INTO DC VOLTAGE LEVELS WHICH DRIVES THE VARICAP DIODE D302 TO CONTROL THE VCO FREQUENCY.

(6) TRANSMITTER / RECEIVER BUFFER AMP

OUTPUT SIGNAL FROM VCO Q304 IS FED INTO THE BUFFER AMPLIFIERS - Q302 TO DRIVE TX RF POWER AMPLIFIERS AND THE RECEIVER 1st LO MIXER, AND Q303 TO DRIVE THE PLL PHASE DETECTOR.

(7) SWITCHING OF TUNING CAPACITOR IN VCO

THE VCO CIRCUIT MUST TUNE WITH A WIDE RANGE OF FREQUENCIES 462.550- 462.725 [MHz] FOR TRANSMIT AND 441.150 – 441.325 [MHz] FOR RECEIVE. ADDITIONAL TUNING CAPACITOR IS SWITCHED INTO THE VCO CIRCUIT FOR RECEIVE OPERATION.

THE TUNING CIRCUIT CONSISTS OF D302, C322, C321, C318, C317, L304, C319, Q304, C315. DURING RECEIVE, Q305 CONDUCTS AND SWITCHED C317 INTO VCO TUNING CIRCUIT WITH D303. DURING TRANSMIT OPERATION, Q305 AND D303 BECOMES TURNED OFF AND SWITCHED C317 OUT OF THE VCO TUNING PATH..

D301 FORMS A FM MODULATOR CIRCUIT CONTROLLED BY TRANSMIT AUDIO LEVEL.

(8) RECEIVER LOCAL OSCILLATOR OUTPUTS

1st MIXER : THE OUTPUT OF VCO Q302 IS INJECTED TO THE BASE OF THE 1st MIXER Q109 THROUGH DIODE SWITCH D106.

2nd MIXER : THE SECOND LO IS GENERATED INTERNALLY IN IC101 WITH 20.945 [MHz] CRYSTAL X101. THE FREQUENCY IS MIXED WITH THE 1ST IF AT 21.400MHz IN THE 2ND IF MIXER TO PROVIDE 2nd IF SIGNAL AT 455 KHz. FM DEMODULATION IS DONE BY QUADRATURE DETECTOR T102 – ALL WITHIN THE FM IF IC.

FREQUENCY STABILITY

LET : F_0 = CRYSTAL OSCILLATOR FREQUENCY

F_r = PHASE DETECTOR REFERENCE FREQUENCY

F_{vco} = VCO FREQUENCY

F_t = TRANSMIT FREQUENCY

THEN : $F_r = F_0 / 2048$

AND UNDER LOCKED CONDITIONS : $F_r = F_{vco} / N$

Where , "N" IS THE DIVIDE RATIO OF PROGRAMMABLE DIVIDER.

THEN : $F_{vco} = N \times F_r$

THE PERCENTAGE ERROR IN F_t IS THE SAME AS THE PERCENTAGE ERROR IN F_0 . THE STABILITY OF THE CRYSTAL OSCILLATOR IS DETERMINED PRIMARILY BY THE CRYSTAL ITSELF AND THE PASSIVE COMPONENTS OF THE OSCILLATOR. A +/-5PPM TEMPERATURE COMPENSATED VCTCXO IS USED TO PROVIDE THE REQUIRED FREQUENCY STABILITY OVER THE REQUIRED VOLTAGE AND TEMPERATURE RANGE.

APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION
AND LIMIT MODULATIONCIRCUITS TO SUPPRESS SPURIOUS RADIATION AND HARMONICS

The tuning circuit between the output of final amp Q101 and antenna, 4-stage "PI-type" network L101, L102, L103, L106, C101, C102, C104, C111 serves as a spurious radiation suppressor. This network also serves to match the impedance between TX final power amp Q101 and the antenna.

CIRCUITS TO LIMIT MODULATION

Audio signals from microphone and alert tones generated by the CPU are amplified by IC806D. After preemphasis equalizing circuit IC806C, the output goes through two stages of splatter filters IC806A-B to limit the audio bandwidth. The signal is then mixed with CTCSS signals generated by IC805, and then routed to the FM modulator in the VCO.

Maximum CTCSS deviation is set by RV803 for ± 4.6 kHz with 1 kHz signal at 20 dB input from the microphone jack, and CTCSS is set to active.

Q821 controls the output level from IC807B to the VCO with preset the maximum modulation to ± 4.6 kHz on 25 kHz bandwidth operation.

CIRCUITS TO SUPPRESS SPURIOUS
RADIATION

FCC ID: MGPGR-1000

APPENDIX 8