GMR1600

OPERATION DESCRIPTION

REV. 0

ASE TELECOM

FEATURE DESCRIPTIONS

The feature set of the GMRS1600 radio is based upon a common set of functions from a most of popular units.

1.1.1 GMRS Channels

Each radio in the product line is capable of transmitting and receiving on any of the available 22 GMRS channels.

Channel 1-14 share with the FRS channel 1-14.

The channel frequency assignments are as follows:

GMRS	Frequencies	FRS
1	462.5625MHz	1
2	462.5875MHz	2
3	462.6125MHz	3
4	462.6375MHz	4
5	462.6625MHz	5
6	462.6875MHz	6
7	462.7125MHz	7
8	467.5625MHz	8
9	467.5875MHz	9
10	467.6125MHz	10
11	467.6375MHz	11
12	467.6625MHz	12
13	467.6875MHz	13
14	467.7125MHz	14
15	462.5500MHz	
16	462.5750MHz	
17	462.6000MHz	
18	462.6250MHz	
19	462.6500MHz	
20	462.6750MHz	
21	462.7000MHz	
22	462.7250MHz	

1.1.2 CTCSS Sub-codes

CTCSS sub-codes are continuous sub-audible tones which are transmitted along with the normal audio signal to allow receiving GMRS radio units to selectively choose which radio transmissions will be heard by the user. While this will not ensure truly private communication, it will help reduce annoying receptions by allowing only those transmissions sent with a corresponding CTCSS sub-code to be heard by the user. The product line implements the most commonly used standard consists of 38 CTCSS sub-codes to be used on any of the GMRS channels. Regardless of the use of CTCSS sub-codes, it cannot be stressed enough that there shall still only be a single transmission on each of the GMRS channels at any moment in time. The sub-codes only serve to limit unwanted radio traffic from being heard. They do not “multiply” the capacity of an individual GMRS channel. The CTCSS sub-codes and their corresponding frequencies are as follows:

Code	Frequency (Hz)	Code	Frequency (Hz)	Code	Frequency (Hz)
0	Disabled	13	103.5	26	162.2
1	67.0	14	107.2	27	167.9
2	71.9	15	110.9	28	173.8
3	74.4	16	114.8	29	179.9
4	77.0	17	118.8	30	186.2
5	79.7	18	123.0	31	192.8
6	82.5	19	127.3	32	203.5
7	85.4	20	131.8	33	210.7
8	88.5	21	136.5	34	218.1
9	91.5	22	141.3	35	225.7
10	94.8	23	146.2	36	233.6
11	97.4	24	151.4	37	241.8
12	100.0	25	156.7	38	250.3

1.1.3 Backlit LCD

All members of the product line utilize LED backlighting to illuminate the LCD display in dark ambient conditions. The LED operation is as follows:

Enabled for 5 seconds upon Monitor button operation within 1 second.
Enabled for 5 seconds upon Power button operation for system ON.

1.1.4 Power on Sequence

When units are powered on, all of LCD display segments will be activated for 400mS.
LCD backlight will be activated for 5 seconds.
Local beep tone will be generated for once.

1.1.5 Auto Squelch

The radio unit is to be quiet during standby/receive mode except when a signal of sufficient strength is received. When a signal level greater than a preset squelch level (8-16dB sinad) is received, the unit will engage the audio output to allow the signal to be heard.

1.1.6 Automatic Battery Saver

The radio unit will enter power save mode automatically within 5 seconds of no button or receive activity. During this mode, the unit will enter a power cycle sequence where it will alternate between monitoring the receive channel for 200ms and entering a low-power “sleep” mode for 400ms. The LCD will continue to operate normally during power cycle mode.

1.1.7 Automatic Channel/Last State Saver

All user programmable parameters are automatically retained during the power off condition.

1.1.8 NiMH Battery

Units equipped for rechargable NiMH battery may be recharged through the user accessory jack of the radio. Units automatically will detect NiMH battery in order to prevent the system from recharging primary type alkaline batteries.

1.1.9 Channel scanning function

Channel scanning allows rapid monitoring of all channels for activity automatically, pausing on a channel for as long as it is active. Scanning will be performed on all GRMS channels and their selected CTCSS sub-codes.
The unit will scan normal channels at a reduced minimum speed of 100mS to check for received carrier and an additional 400mS if a CTCSS code is selected for channel.

1.1.10 Monitoring

Monitoring allows to override the automatic squelch operation.

1.1.11 Battery Low Alert

Under a low battery condition, a “low battery warning” tone will be emitted at a 2 minute interval during receive mode and no sooner than 30 seconds after switching from Transmit to Receive mode.

1.1.12 Key Lock

Key is locked by pressing and held “Emergency” button for 3 seconds.

1.1.13 Tones

All units are capable of generating a predefined paging tone pattern for alerting other units on the same channel/CTCSS sub-code. Units with user selectable paging tone patterns allow distinctive paging alerts for easier identification of the paging source. The paging tone patterns are as follows:

1.2 BLOCK DIAGRAMS

1.3 BUTTONS AND CONTROLS

All units in the product line utilize the same set of buttons and switches for all control functions and parameter programming. The controls for each unit are as follows:

POWER ON,OFF
This button turns the radio on/off. This button is pressed and held for over 1 second to turn on. Turning the radio on initiates a CPU reset and restarts the system software.
This button is pressed and held for over 2 second to turn off.

PTT / PAGING:
To transmit, the button must be pressed and held for the duration of the user transmission.

The button must be pressed for a twice to transmit a preprogrammed sequence of tones to be used as an audio paging function of other users on the same channel/sub-code. The transmitted tones will be output locally through the speaker or audio accessory jack for confirmation.

MONITOR / BACKLIT LCD:
This button is pressed and held to check the current GMRS channel for current activity and override the automatic squelch operation.
After this button is pressed & held for more than 2 second, monitoring will be continued without holding this button.

To terminate the continued this operation, press this button once.

This button turns the backlit LCD. This button is shortly pressed to turn on and pressed again to turn off.

EMERGENCY / KEY LOCK:
This button is pressed and released to Emergency channels.

This button is pressed & held for more than 4 second to set key locking mode. PTT, Monitor, Emergency button, Power Hi/Low, VOX, Beep On/Off and Roger Beep On/Off operate.

FUNCTION :
This button is pressed and held for 1 second to enter User Menu Programming mode to allow Channels, CTCSS sub-code, Paging Tone selection and other user-programmable parameters selection.

UP Arrow:
This is a increment button for volume level in Normal mode.

This is a generic increment button to be used to advance through channels and CTCSS sub-code, Paging tone and parameter select in User Programming Mode.

DOWN Arrow:
This is a decrement button for volume level in Normal mode.

This is a generic decrement button to be used to step back through channels and CTCSS sub-code, Paging tone and parameter selections in User Pro

1.4 LCD INDICATORS

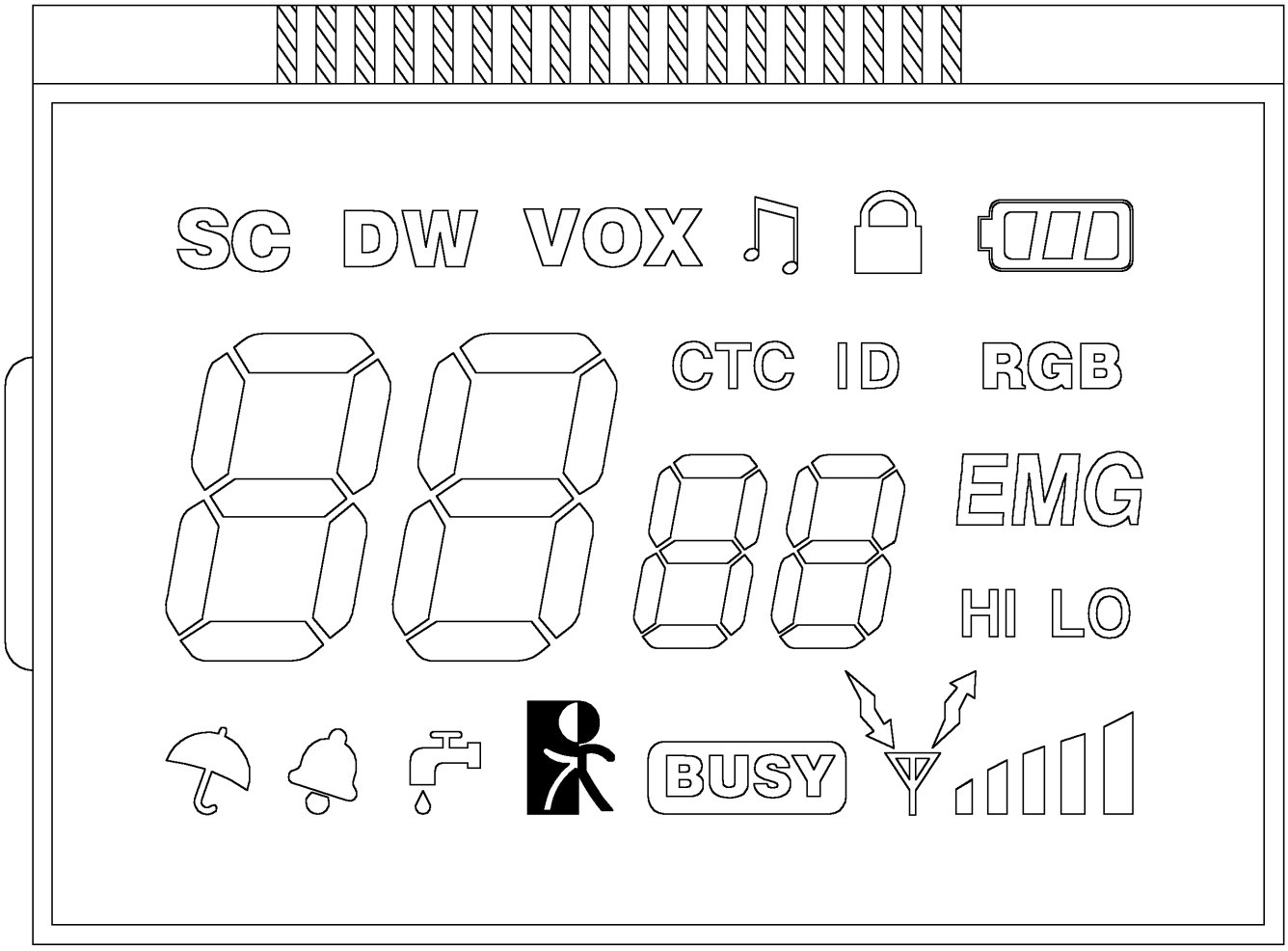
A common LCD display will be utilized on the family members of GMRS radios. The LCD segment definitions and drawings for the GMRS1600 are as follows:

1.4.1 GMRS1600

[GMRS1600 LCD Picture Here]

1.4.2 GMRSRD1

[GMRSRD1 LCD Drawing]



2. User Interface Control Description

2.1 GMRSRD1 USER INTERFACE

The enhanced feature set of the GMRSRD1 model requires a menu system to minimize the number of buttons used.

CHANNEL – CTCSS – POWER --- CHANNEL SCAN --- CTCSS SCAN --- DW –-- VOX ---
I I I I I I I
1-22 0-38 Hi/LO OFF-22 OFF-38 OFF-22 OFF-5

--- BEEP --- ROGER --- CALLER ID --- TONES
I I I I
ON/OFF ON/OFF OFF-10 1-3

2.1.1 Transmit

TRANSMIT mode is entered by pressing and holding the PTT button for the duration of the transmission. TX icon will indicate.
There is no key-beep generated when the PTT button is pressed.

2.1.2 Paging Tone Generation

Paging mode is entered by pressing the PTT for a twice.
The Paging tone alert sequence is transmitted one time and is also locally generated for confirmation of operation. Call icon will indicate. There is no auto-repeat function for the Paging mode.
The unit will return to standby mode following completion of the Paging tone sequence regardless of the Paging mode state.

2.1.3 Channel Monitor

MONITOR mode is entered after pressing and holding. RX icon will indicate.
The receive audio will be output to the speaker or accessory jack.
After this button is pressed & held for more than 2 second, monitoring will be continued without holding this button for while the Monitor button is pressed again.

2.1.4 Emergency Operation

Emergency mode is entered by pressing and holding “EMG” button for 4 second.
Channels will be set to channel 20.

2.1.5 Menu Selection

MENU mode is entered by pressing the MENU button for at least 1 second.
The keybeep is locally generated when menu mode is engaged and user programming is enabled upon MENU release.
The active menu selection can be advanced to the next menu by pressing the MENU button for no longer than 1 second.
Pressing MENU longer than 2 second will exit MENU mode.
MENU mode exits to standby mode when the MENU button is pressed while the final menu selection is active.
MENU mode will automatically time out to standby mode 10 seconds after the last user programming button is pressed.
MENU mode is cancelled by pressing PTT to enter TRANSMIT mode.

2.1.6 Channel selection

Channel selection is active when the current channel in the large segment display digits is blinking.

INCREMENT the channel by pressing and releasing the UP Arrow button.
Engage auto-repeat by holding the UP Arrow button for 500ms.
The channel will increment at a 200ms rate for the button press duration.
A standard key-beep will be locally generated with each increment.

DECREMENT the channel by pressing and releasing the DOWN Arrow button.
Engage autorepeat by holding the UP Arrow button for 500ms.
The channel will decrement at a 200ms rate for the button press duration.
A standard keybeep will be locally generated with each decrement.

2.1.7 CTCSS Sub-code Selection

The CTCSS sub-code programming is active when the current sub-code in the small segment display digits is blinking.

INCREMENT the CTCSS sub-code by pressing and releasing the UP Arrow button.
Engage autorepeat by holding the UP Arrow button for 500ms.
The CTCSS sub-code will increment at a 200ms rate for the button press duration.
A standard keybeep will be locally generated with each increment.
Each time the CTCSS sub-code increments from sub-code 38 to sub-code 0, a special keybeep will be locally generated as a reference for visually impaired users.

DECREMENT the CTCSS sub-code by pressing and releasing the DOWN Arrow button.
Engage autorepeat by holding the DOWN Arrow button for 500ms.
The CTCSS sub-code will decrement at a 200ms rate for the button press duration.
A standard keybeep will be locally generated with each decrement.
Each time the CTCSS sub-code decrements from sub-code 1 to sub-code 0, a special keybeep will be locally generated as a reference for visually impaired users.

2.1.8 Power High/Low Selection

The status may be entering by pressing UP/Down button at Power selection mode.
A standard keybeep will be locally generated each time the mode status selects.

High/Low Power mode will be operated on channel 1-7, 15-22. On channel 8-14, only low power mode will be operated automatically.

2.1.9 Scanning Operation

The operation may be entering by pressing Up/Down button at Scanning mode.
Channels will be scanned at 200mS rate.

Operation terminates by press “Function button”.

2.1.10 Dual watch Selection

The Dual watch channel selection is active when the current channel in the large segment display digits is blinking.

INCREMENT the DW sub-channel by pressing and releasing the UP Arrow button.
Engage autorepeat by holding the UP Arrow button for 500ms.
The DW sub-chanel will increment at a 200ms rate for the button press duration.
A standard keybeep will be locally generated with each increment.
Each time the DW sub-channel increments from OFF to channel 22, a special keybeep will be locally generated as a reference for visually impaired users.

DECREMENT the DW sub-channel by pressing and releasing the Down Arrow button.
Engage autorepeat by holding the Down Arrow button for 500ms.
The DW sub-chanel will decrement at a 200ms rate for the button press duration.
A standard keybeep will be locally generated with each increment.
Each time the DW sub-channel decrements from OFF to channel 1, a special keybeep will be locally generated as a reference for visually impaired users.

Operation terminates by press “Function button”.

2.1.11 VOX mode Selection

The status may be entering by pressing UP/Down button at VOX selection mode.
A standard keybeep will be locally generated each time the mode status selects.

There are a 5 kinds of VOX level sensitivities.

2.1.12 Beep On/Off Selection

The status may be entering by pressing UP/Down button at Beep On/Off selection mode.
A standard keybeep will be locally generated each time the mode status selects.

2.1.13 Roger tone On/Off Selection

The status may be entering by pressing UP/Down button at Roger tone On/Off selection mode.
A standard keybeep with be locally generated each time the mode status selects.

2.1.14 Caller Identification (ID) Selection

The status may be entering by pressing UP/Down button at ID selection mode.
Press the Up or Down button to select the desired caller identification code for your unit between 1 and 10. A standard keybeep will be locally generated each time the mode status selects.

2.1.15 Paging Tone Selection

The status may be entering by pressing UP/Down button at Paging tone selection mode.
Each tone melody will be locally generated each time the mode status selects.
There are a 3 kinds of Paging tone melody.

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Safety Information For FRS UNIT

Your wireless handheld portable transceiver contains a low power transmitter.
When the Push-to Talk(PTT) button is pushed it sends out radio frequency (RF) signals. This 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.

Important Note: To maintain compliance with the FCC's RF exposure guidelines, hold the transmitter and antenna at least 1 inch (2.5 centimeters) from your face and speak in a normal voice, with the antenna pointed up and away from the face.
If you wear the handset on your body while using the headset accessory, use only the manufacturers supplied belt clip for this product and ensure that the antenna is at least 1 inch(2.5 centimeters) from your body when transmitting.

Use only the supplied antenna. Unauthorized antennas, modifications, or attachments could damage the transmitter and may violate FCC regulations.

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 UNDERSIRED OPERATION.