

# GMH Flex•Mode Mobile Radio Owner's Manual



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## INTRODUCTION

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The BK Radio GMH Flex•Mode Series mobile VHF radio uses a microprocessor core allowing features and performance previously unavailable in a mobile radio. It features a 38 MHz operating frequency spread, computer programmability, alphanumeric display, compact size, and built-in CTCSS/CDCSS. Please take a moment to acquaint yourself with the information in this manual to assure optimum performance from the radio.

## FCC REQUIREMENTS

The GMH radio must be properly licensed by the Federal Communications Commission prior to use. Your local BK Radio dealer can assist you in meeting this requirement.

## SAFETY PRECAUTIONS

- A. Do not operate the transmitter in close proximity to blasting caps.
- B. Do not operate the radio in an explosive atmosphere (petroleum fuels, solvents, dust, etc.).
- C. Do not operate the transmitter if a person outside the vehicle is within two feet of the antenna or touching the antenna.
- D. Do not install the radio in a closed compartment that contains an LP gas container or its fittings.
- E. The radio must be properly grounded.
- F. The equipment must be installed and serviced by a qualified technician.

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## BASIC OPERATION

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### RECEIVE

**TURN POWER ON** by turning the Volume knob clockwise past the OFF detent. The radio will beep, indicating that it has passed its self test and is operational.

**SET VOLUME** by pressing the MON button to hear squelch noise. Turn the Volume knob to set a comfortable volume level. Press the MON button again to stop squelch noise.

**SELECT A CHANNEL GROUP** (if applicable) by pressing the GRP button and turning the Channel Selector knob. Press the GRP button again to return to channel select mode. See “GRP” on page 6.

**SELECT A CHANNEL** by turning the Channel Selector knob. After reaching the highest number, the radio wraps to Channel 1.

The display can show channel numbers (numeric mode), channel labels (alphanumeric mode), or receive and transmit frequencies. The display mode and channel labels are programmed by the technician along with group labels (if applicable) and channel frequencies. The display shows slightly different indications during Channel Scan and Priority Scan operation in alphanumeric and numeric modes.

### TRANSMIT

**PRESS THE PTT** (Push To Talk) switch on the microphone. The **TX** annunciator appears on the display and the red Transmit indicator illuminates while the PTT is pressed. Talk in a normal voice with the microphone approximately one to two inches from your mouth. Release the PTT switch to stop transmitting.

If the **TX** annunciator does not appear and a tone is heard, you are on a receive-only channel or the channel is busy (if Busy Channel Lockout is enabled). Turn the Channel Selector knob to an authorized transmit channel or wait until the channel is clear (if Busy Channel Lockout is installed).

If the length of your transmission exceeds the preset time-out timer setting, the transmitter automatically shuts off and a tone sounds. To continue the transmission, release the PTT switch, and then press it again and continue talking.

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## CODE GUARD OPERATION

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Code Guard™ allows one radio or group of radios to be selectively called within a system. If the radio has been programmed with Code Guard, use the following receive and transmit instructions. Also see “CG” on page 7.

### CODE GUARD RECEIVE

**TURN POWER ON** by turning the Volume knob clockwise past the OFF detent. The radio will beep, indicating that it has passed its self test and is operational.

**SET VOLUME** by pressing the MON button to hear squelch noise. Turn the Volume knob to set a comfortable volume level. Press the MON button again to stop squelch noise.

**SELECT A CHANNEL GROUP** (if applicable) by pressing the GRP button and turning the Channel Selector knob. Press the GRP button again to return to channel select mode. See “GRP” on page 6.

**SELECT A CHANNEL** by turning the Channel Selector knob. After reaching the highest number, the radio wraps to Channel 1.

**PRESS THE CG BUTTON** to disable or enable Code Guard operation. An arrow on the display points to the CG button when Code Guard is **disabled**. When Code Guard is enabled, a message is heard only when the proper Code Guard is received.

### CODE GUARD TRANSMIT

**MONITOR THE CHANNEL**, before transmitting on Code Guard channels, by lifting the microphone off hook or pressing the MON button. Listen to the channel for a few seconds to ensure that no communications are occurring on the channel.

**PRESS THE PTT** (Push To Talk) switch on the microphone. The **TX** annunciator appears on the display and the red Transmit indicator illuminates while the PTT is pressed. Talk in a normal voice with the microphone approximately one to two inches from your mouth. Release the PTT switch to stop transmitting.

**HANG UP THE MICROPHONE** when finished. If you pressed the MON button to monitor the channel, press it again after the transmission to return to Code Guard operation.

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## CHANNEL SELECTION

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Radios with more than 16 channels are separated into groups of 16 channels each. Each group of 16 channels can be programmed to have an "individual personality" with its own set of operational features.

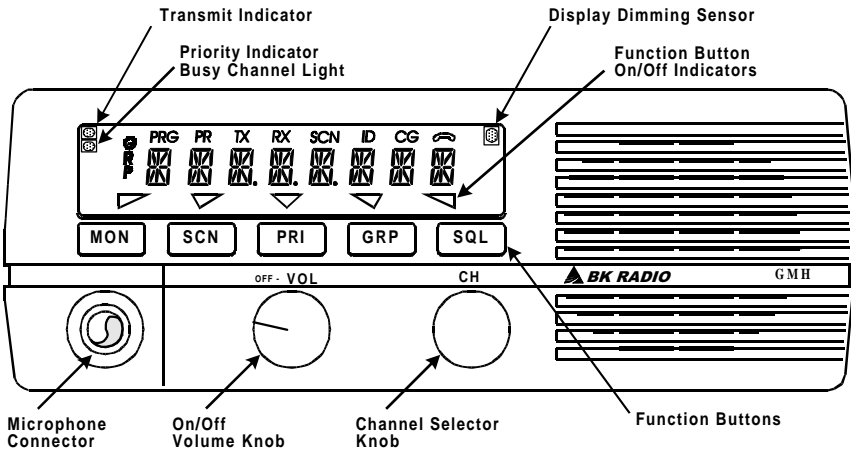
**SELECT A CHANNEL GROUP** (if applicable) by pressing the GRP button and turning the Channel Selector knob. Press the GRP button again to return to channel select mode. See "GRP" on page 6.

**SELECT A CHANNEL** by turning the Channel Selector knob. After reaching the highest number, the radio wraps to Channel 1.

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## GMH RADIO CONTROLS

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## BUTTON FUNCTIONS

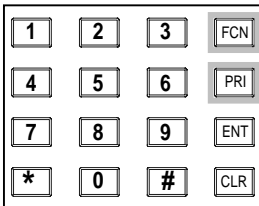
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When the radio is installed, labels are placed on the front push buttons to indicate their functions. An arrow on the display points to each front mounted push button that is active. The five push buttons can be programmed with the following functions:

<b>MON</b>	Monitor Squelch Noise	<b>TA</b>	Repeater Talk Around	<b>GSC</b>	Group Scan
<b>SCN</b>	Channel Scan	<b>CG</b>	Code Guard Disable	<b>PA</b>	Public Address
<b>PRI</b>	Priority Scan	<b>HOM</b>	Home Channel	<b>ACC</b>	Accessory 1
<b>GRP</b>	Group Select	<b>SPK</b>	Remote Speaker	<b>ACC</b>	Accessory 2
<b>SQL</b>	Squelch Adjust	<b>NXT</b>	Next Scan Channel	<b>ACC</b>	Accessory 3
		<b>LPW</b>	Low Power Select		

## BUTTON FUNCTION MENU

If a keypad microphone is used with the GMH radio, many of the functions above may also be enabled/disabled with the keypad **[FCN]** key. Not all microphones support these functions. Contact your dealer to determine which features are available with your microphone and have been enabled in the radio.



1. Press the **[FCN]** key to display the function menu.
2. Press **[PRI]** to toggle the function on/off when the desired menu item is displayed.
3. Repeatedly press **[FCN]** to step through the menu.
4. When the display flashes, the function is enabled.
5. Press **[ENT]** to exit the **[FCN]** menu.

Push button controls are described in the following sections.

### **MON Monitor Squelch Noise**

Press the MON button to start or stop monitoring squelch noise. This allows you to set a comfortable volume level.

### **SCN Channel Scan**

Press the SCN button to start or stop scanning channels in the scan list. Scan operation occurs only while the radio is not transmitting. To add or delete the current channel from the scan list, turn Scan and Priority Scan off, then press the SCN button and hold it down for 1 second or more. See “Scan Operation” on page 9.

### **PRI Priority Scan**

Press the PRI button to start or stop priority scanning. The **PR** annunciator and the flashing SCN annunciator appear on the display. To make the current channel the fixed Priority 1 Channel, turn Scan and Priority Scan off, then press the PRI button and hold it down for 1 second or more. See “Priority Scan” on page 11.

### **GRP Group Select**

Press the GRP button to toggle between Group Select and Channel Select modes. This is used only if the radio has more than one channel group. Press the GRP button for Group Select mode. Turn the Channel Selector knob to select a group. Return to Channel Select mode by waiting 5 seconds, or by pressing the GRP button one time (numeric mode) or two times (alphanumeric mode). After selecting a group in alphanumeric mode, press the GRP button one time to display the group label, and a second time to return to Channel Select mode.

### **SQL Squelch Adjust**

Press the SQL button to toggle between Squelch Adjust and Channel Select modes.

Press the SQL button for Squelch Adjust mode. Turn the Channel Selector knob to adjust the squelch setting. Turning the knob counter-clockwise tightens the squelch setting, allowing only stronger signals to open the squelch and be heard. In the absence of a held channel, the receiver will be tuned to the main channel. Guard qualification will be disabled during squelch adjustment.

Return to Channel Select mode by pressing the SQL button again.

Pressing the SQL button and holding for more than 1 second (until beep is heard) sets the squelch to its factory preset value.

## **TA Repeater Talk Around**

Press the TA button to turn Repeater Talk Around on or off. When TA is on, the radio transmits on the receive frequency of the selected channel, bypassing or “talking around” the repeater. This function may be used on any channel that is programmed to a frequency pair (repeater channel).

## **CG Code Guard Disable**

Press the CG button to disable or enable Code Guard operation. An arrow on the display points to the CG button when Code Guard is **disabled**. When Code Guard is enabled, a message is heard only when the proper Code Guard is received. Transmit Code Guard generation is unaffected. The CG button may also be used to override Busy Channel Lockout, if that is installed.

## **HOM Home Channel**

Press the HOM button to go to the pre-programmed Home Channel.

To set a different Home Channel, select the desired channel using the Channel Selector knob, press the HOM button, and hold it for more than 1 second until the arrow above the HOM button appears on the display. The new channel then becomes the Home Channel.

## **SPK Remote Speaker**

Press the SPK button to toggle between the built-in radio speaker and a remotely mounted speaker.

## **NXT Next Scan Channel**

Press the NXT button to select the next consecutive channel in the scan list (not during Scan operation).

## **LPW Low Power Select**

Press the LPW button to toggle between high power and low power transmitter operation. Transmitter power settings can be programmed from 15 to 50 watts. If per-channel power is enabled, channels locked to low power will always transmit in low power mode regardless of the state of the LPW button.

## **GSC Group Scan**

Press the GSC button to enable or disable Group Scan operation. During Group Scan operation, the following features are disabled: Priority Scan, User Code Guard, and Nuisance Channel Delete.

Turn Group Scan off, then press the GSC button for 1 second or more to toggle the current group on or off the group scan list.



**PA    Public Address**

Press the PA button to turn the Public Address system on or off. When PA is on, pressing the microphone PTT switch causes audio to be routed to the audio amplifier without enabling the transmitter.

**ACC    Accessory**

Press the ACC button to turn the installed accessory on or off. Up to three ACC buttons may be installed for different accessories.

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## SCAN OPERATION

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### RECEIVE

Scan operates only while the radio is not transmitting. The radio checks for signals on channels in the preset scan list, as well as the channel selected by the Channel Selector knob.

When a signal is detected, scanning stops and the message is received. The received channel is shown in place of the transmit channel.

Once the signal ends, the radio continues to monitor the channel for the preset scan delay time before it resumes scanning.

#### Basic Scan

Press the SCN button to enable Scan (an arrow will appear above the button).

If Priority Scan is enabled, press the PRI button to turn it off.

The display indicates Scan operation by flashing the **SCN** annunciator (alphanumeric mode) or by two flashing bars (numeric mode).

#### Scan Code Guard Channels

Press the SCN button to enable Scan (an arrow will appear above the button).

If the CG button has an arrow over it, press the CG button once to turn Code Guard Disable off.

When a signal is detected, scanning stops while the radio checks for the proper Code Guard value. If the signal contains the proper Code Guard value, the radio receives the message. Otherwise, the radio resumes scanning immediately.

#### Nuisance Channel Delete

With Channel Scan on and Nuisance Channel Delete enabled, pressing and holding the SCN button for more than 1 second will temporarily remove a currently active channel from the scan list. If the radio is equipped with a keypad microphone, pressing the **[CLR]** key while Scan is on will accomplish the same thing. Not all microphones support these functions. Contact your dealer to determine which features are available with your microphone and have been enabled in the radio. When the radio is powered off and back on, the pre-programmed scan list will be restored.

## TRANSMIT WITH SCAN ON

When operating in Scan mode, the radio transmits on the channel selected by the Channel Selector knob.

Select a transmit channel by turning the Channel Selector knob.

Press and hold the PTT switch and talk in a normal voice. When the PTT switch is released, the radio continues to monitor the selected channel for the preset scan delay time before it resumes scanning.

### Talkback Scan

If your radio is programmed for Talkback Scan, press PTT while a channel is active or while scan-delay time remains. You will be responding on the transmit frequency of the received channel.

Talkback Scan will not work if Priority Scan is also on and your radio is programmed to always transmit on the Priority 1 channel.

## CHANGE THE SCAN LIST

The radio can be programmed to enable the user to add or remove channels from the scan list. If user changes are enabled, follow these steps to change the scan list:

Turn Scan and Priority Scan off.

Select a channel to be added or removed from the scan list by turning the Channel Selector knob. If the channel is already on the scan list, **SCN** appears in the display.

Press and hold the the SCN button for more than 1 second to toggle the channel on or off the scan list.

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## PRIORITY SCAN

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Priority Scan enables the radio to receive on any channel while monitoring for a message on the designated priority channel(s). The radio samples each priority channel at a preset rate (.25-2.0 seconds) regardless of activity on any other channel. Priority Scan operates only while the radio is not transmitting and can be used in combination with Scan operation.

When Priority Scan is on, the **PR** annunciator illuminates, and the display flashes **SCN** (alphanumeric mode) or two flashing bars (numeric mode). If a message is received on a priority channel, the Priority indicator illuminates, and the radio receiver locks onto that channel for the duration of the transmission, unless a higher priority channel interrupts.

Priority Scan can be used in combination with Code Guard with:

Priority Scan on (arrow appears above PRI button)

Code Guard Disable off (no arrow above CG button)

The priority channel(s) programmed with Code Guard

If a message is received on a priority channel, the radio receiver locks on to the priority channel and checks to see if the proper Code Guard value is present. If the signal contains the proper Code Guard value, the radio receives the message. Otherwise, the radio will re-check the channel every 4 seconds, until the activity on the channel ceases.

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## DUAL PRIORITY SCAN

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In each group, up to two of the sixteen channels can be designated as priority channels. These two, PR1 and PR2, are periodically tested for activity, even if a different transmission is being listened to. Activity on PR2 preempts activity on any of the non-priority channels. Receptions on PR1 have priority over any other channel in the group, including PR2.

Either priority channel can be programmed as a fixed channel, tied to the Channel Selector knob, or programmed OFF. If the radio is programmed to transmit on the first priority channel, transmissions will occur on PR1, if PR1 isn't programmed OFF, when operating in Dual Priority Scan mode.

If PR1 is a fixed channel, and changes to the 1<sup>st</sup> priority channel are allowed, the user can move the channel selector to a new channel and press and hold the PRI button for more than 1 second to choose a new PR1 channel.

Dual Priority Scan is automatically disabled when Group Scan is on.

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## OLD-STYLE BK PRIORITY SCAN

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The radio can be programmed with one of three priority modes: A, B, or C. The table below shows how the priority channel and the transmit channel are selected in each mode.

	Mode A	Mode B	Mode C
Priority Channel	Channel Knob	Preset	Preset
Transmit Channel	Channel Knob	Channel Knob	Priority Channel

### Priority Mode A

In Priority Mode A, the priority channel is set by the Channel Selector knob. Priority Mode A is seldom used by itself because the radio receives and transmits only on the knob-selected channel.

When Scan and Priority Mode A are enabled, scanning occurs until an active scan channel is found. The radio receives the message while continuing to check the priority (knob-selected) channel. The display shows the scan channel.

If the priority channel becomes active during this message, the Priority indicator illuminates.

The radio changes to the priority channel and holds for the duration of the message. The display shows the priority channel.

To reply to a message on the priority channel, press the PTT switch and transmit on the priority channel. Once activity ceases on the priority channel, the radio returns to Scan operation.

### Priority Mode B

With Priority Scan on and Channel Scan off, the radio can receive on the knob-selected channel while sampling the priority channel. If the priority channel becomes active, the Priority indicator illuminates. The radio changes to the priority channel and holds for the duration of the transmission

To reply to a message on the priority channel, turn the Channel Selector knob to the priority channel, and then transmit.

With Priority Scan and Channel Scan on, the radio scans until it locks on to an active channel. The radio continues to sample the priority channel while listening to the active scan channel. If activity occurs on the priority channel, the radio overrides the active scan channel, changes to the priority channel, and holds for the duration of the transmission.

To reply to a message on the priority channel, turn the Channel Selector knob to the priority channel, and then transmit. Once activity has ceased on the priority channel, the radio returns to Scan operation.

### **Priority Mode C**

With Priority Scan on and Channel Scan off, the radio samples the fixed priority channel at the preset rate. If activity occurs on the priority channel, the radio changes to the priority channel and holds for the duration of the transmission.

To reply to a message heard on the priority channel, press the PTT switch. The radio transmits only on the priority channel when Priority Scan is on. Once activity has ceased on the priority channel, the radio returns to the receive channel on the Channel Selector knob.

With Priority Scan and Channel Scan on, the radio scans until it locks on to an active channel. The radio continues to sample the priority channel while listening to the active channel. If activity occurs on the priority channel, the radio overrides the active scan channel, changes to the priority channel, and holds for the duration of the transmission.

To reply to a message heard on the priority channel, press the PTT switch. The radio transmits only on the priority channel when Priority Scan is on. Once activity has ceased on the priority channel, the radio returns to Scan operation.

### **Change The Priority Channel**

The fixed priority channel can be permanently set or can be changeable. If the radio has a changeable priority channel, use the following steps to make this change.

1. Turn Scan and Priority Scan off.
2. Turn the Channel Selector knob to the channel you want to enter as the new priority channel.
3. Press and hold the PRI button for more than 1 second. A short beep sounds and PR appears in the display, indicating that the displayed channel is now the priority channel.

**NOTE:** If the radio is programmed for Dual Priority operation, only Priority Channel 1 can be changed with the PRI button.

**NOTE:** A channel can be the priority channel even if it is on the scan list. Due to multiple sampling of the same channel, however, maximum performance occurs when the priority channel is not on the scan list.

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## USER SELECTED CODE GUARD

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User Selected Code Guard is only available on radios equipped with a keypad microphone. Not all microphones support this function. Contact your dealer to determine which features are available with your microphone and have been enabled in the radio.

When the radio is being programmed with transmit and receive frequencies for each channel, a receive Code Guard value and a transmit Code Guard value can also be assigned to each channel. If User Code Guard selection is enabled, the Code Guard values for any channel can be temporarily assigned to the knob-selected channel.

For example, to use the Code Guard values of Channel 9 with the frequencies of Channel 5:

1. Turn Scan and Priority Scan OFF.
2. Turn the Channel Selector knob to Channel 5.
3. Press the **[9]** key on the microphone keypad. The display shows **CG**.

The radio will now operate on the frequencies of Channel 5 with Channel 9 Code Guard values. The display shows the Code Guard channel (9), and then the selected channel (5).

Press the microphone's **[#]** key to display the Code Guard channel briefly. The display shows the group number, followed by the Code Guard channel, and then the selected channel.

Press the **[0]** key to reset all values to the original programming, or press different number keys (1-16) to select a different set of Code Guard Values.

**NOTE:** During Scan or Priority Scan, the display does not show user-selected Code Guard values, nor does it qualify incoming signals with the user-selected Code Guard values in Scan mode.

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## GROUP SCAN

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Channels on each "channel scan list" and groups on the "group scan list" are scanned sequentially. The knob-selected group is always scanned when Group Scan is enabled, even if that group is not on the group scan list.

When Group Scan is enabled, the following features are disabled:

- Dual Priority Scan
- User-Selected Code Guard
- Nuisance Channel Delete

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## OTHER OPERATIONAL FEATURES

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The BK Radio G Series radio is based on a microprocessor core that allows extra features and operational characteristics to be programmed into the radio. Your dealer can help define the best operational settings for your system and program them into the radio.

### Scan Delay

Scan delay lets the radio receive a response to a transmission before scanning the other channels for activity. If you find that your scanner is restarting before message replies are received, you can ask your dealer to increase the scan delay time (0-7.5 seconds).

### HI/LO Transmit Power

Each channel in the radio can be individually programmed to always transmit in low-power mode, regardless of the position of the radio's LPW button (or microphone keypad **[FCN]** menu setting). If the programming for the channel allows high-power transmissions, the power level can be selected with the LPW button or the keypad **[FCN]** menu.

### DTMF Encoding

Radios with keypad-equipped microphones can be programmed to enable DTMF (Dual Tone Multiple Frequency) encoding. To send DTMF tones (similar to the tones used by a standard push-button telephone):

Press and hold the PTT switch.

Press any of the keys on the microphone's keypad.

You will hear a sidetone.

The **[FCN]**, **[PRI]**, **[ENT]**, and **[CLR]** keys respond as DTMF tones A, B, C, and D, respectively.

### ANI Encoding

ANI encoding (Automatic Numeric Identification), if enabled, transmits a sequence of DTMF tones each time you press the PTT switch. You will hear a sidetone. Your dealer can program the ANI number to be sent.

If DTMF and ANI are both enabled, the ANI tone sequence is transmitted only after the microphone's **[ENT]** key is pressed while the PTT switch is activated. You will hear a sidetone.



## Time-Out Timer

The transmit time-out timer limits the duration of calls and guards against accidentally locking on the transmitter and tying up the radio system. Your dealer can program the duration of the time-out timer (15-225 seconds, or disabled).

## Busy Channel

If the radio has been programmed for busy channel operation, it will operate in one of the following three modes:

Busy Channel Indication

Busy Channel Lockout

Busy Channel Lockout Override

## Busy Channel Indication

The yellow Busy Channel indicator illuminates if there is carrier activity on the selected channel. If the selected channel is a Code Guard channel and the proper Code Guard value is not detected, the Busy Channel indicator remains on for the duration of the carrier activity and no message is heard. During Scan and Priority Scan operation, the Busy Channel indicator illuminates when activity is detected on any channel on the scan list.

When scanning or priority scanning Code Guard channels and activity has been detected, the Busy Channel indicator illuminates for the time period necessary to determine if the proper Code Guard value has been received, causing the Busy Channel indicator to flash at various rates.

## Busy Channel Lockout

The busy channel lockout feature applies only to those channels programmed for receive Code Guard operation. When carrier activity is detected on the channel selected, the radio checks the receive Code Guard value. If the proper Code Guard value is present, the radio can transmit on that channel.

If the radio detects an incorrect value or carrier activity only, the transmitter is disabled, an alert tone is heard, and the display shows the word **BUSY** when the PTT switch is pressed, whether the CG button is on or off.

Channels not programmed for receive Code Guard operation can be used to transmit regardless of carrier activity.

## Busy Channel Lockout Override

This mode operates in the same manner as busy channel lockout except that the user can override and transmit by pressing the CG button to disable receive Code Guard (an arrow will appear over the button). The transmitter is locked out only if the CG button is off (no arrow above the CG button).

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## ALPHANUMERIC DISPLAY FEATURES

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GMH Series mobile radios that are equipped with keypad microphones can be programmed with the following features. Not all microphones support these functions. Contact your dealer to determine which features are available with your microphone and have been enabled in the radio.

### Channel Labels

You can program the radio with a label for each of the 15 channel groups and a label for each of the 16 channels within each group.

To display the channel number associated with a channel label:

Press the **[#]** key to display the group number.

Press the **[#]** key again to display the channel number.

Press and hold the **[#]** key to display the channel label.

Press the **[ENT]** key or wait for about 5 seconds to revert to normal radio operation.

Each label can include up to eight characters, with decimal points available between characters. Characters can include A-Z, 0-9, -, \*m \$, /, +, %, \, /, \_, <, >, h, or a blank space.

### Group Labels

The display can show group labels in addition to group numbers.

To display a group label:

Press the **[#]** key on the keypad to display the group number.

Press and hold the **[#]** key to display the group label.

Press the **[ENT]** key or wait for about 5 seconds to revert to normal radio operation.

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## **INSTALLATION**

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Please refer to the Service Manual or to the Installation Kit's Instructions for installation information.

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## **SERVICE**

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If you need service, contact your BK Radio dealer or any other BK Radio dealer equipped to service your radio. If you find it impractical to have service performed by your local dealer, contact BK Radio at the address below:

**BK Radio**

**7100 Technology Drive**

**West Melbourne, FL 32904**

**Phone: (800) 422-6281**

**Fax: (321) 953-7986**

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# NOTES

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