SECTION III
OPERATION

3.1 INTRODUCTION

This section contains information concerning the operation procedures of the GMH Series radio. Information on programming and installation is contained in Section 2 of this manual.

3.1.1 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.

3.2 BASIC OPERATION

3.2.1 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 Select knob. Press the GRP button again to return to channel select mode. See “GRP” on page 3-5.

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.

3.2.2 Transmit

PRESS THE PTT (Push To Talk) switch on the microphone. The TX annunciator appears on the display and the red Transmit indicator glows 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 Select knob to an authorized transmit channel or wait until the channel is clear (if Busy Channel Lockout is installed).

If the length of the message 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.

3.2 CODE GUARD OPERATION

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.

3.2.1 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 Select knob. Press the GRP button again to return to channel select mode. See “GRP” on page 3-5.

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.

3.2.2 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 glows 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.

3.3 Button Functions

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:

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

Each of these controls is 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, press the SCN button and hold it down for 1 second or more. See “Channel Scan” on page 3-7.

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 channel, press the PRI button and hold it down for 1 second or more. See “Priority Scan” on page 3-11.

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.

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 Select 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.

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.

GRP Channel Group

Press the GRP button to toggle between Group Select and Channel Select modes. This is used only if the radio has been programmed to divide the available channels into groups.

Press the GRP button for Group Select mode. Turn the Channel Select 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.

SPK External Speaker

Press the SPK button to toggle between the built-in radio speaker and an external 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.

GSC Group Scan

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

Press the GSC button for 1 second or more to toggle the current channel's group on or off the group scan list.

SQL Squelch Adjust

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

Press the SQL button for Squelch Adjust mode. Turn the Volume 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 Volume Adjust mode by waiting 5 seconds, or by pressing the SQL button again.

Pressing the SQL button and holding for more than 1 second sets the squelch to its factory preset value.

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.

3.3.1 Built-In Features

BK Radio GMH radios are based on a microprocessor core that allows extra features and operational characteristics to be built into the radio. Your dealer will help define the best operational settings for your system and program them into the radio.

Additional Frequencies

Additional transmit and receive frequencies can be added. If you wish to monitor other local radio systems that fall anywhere in your band, a frequency with or without Code Guard can be added to your program.

Time Out Timer

The time out timer limits the duration of calls and guards against accidentally locking on the transmitter and tying up the radio system. The duration of the time out timer can be changed by your dealer. (15-225 seconds, or 0 - disabled)

DTMF/ANI

A DTMF/ANI encoding feature is also available. If enabled by your dealer, a sequence of DTMF tones (similar to the tones used by a standard pushbutton telephone) are transmitted each time the transmit PTT switch is activated.

Scan Delay

Scan delay allows the radio to 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 heard, you can ask your dealer to increase the scan delay time. (0-7.5 seconds)

Keyboard Microphone Operation

If a keyboard microphone is used with the GMH radio, the following features may be enabled. 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.

Group Selection

Select a channel group by pressing the # key on the keyboard microphone followed by the number of the desired group. This is used only if the radio has been programmed to divide the available channels into groups.

DTMF Encode

DTMF Encode (telephone touch tone) is accomplished by pressing and holding the keyboard microphone PTT switch, and then pressing the 0 - 9 keys for the encoding operation desired. After the desired numbers have been entered, monitor or transmit as required.

ANI Operation

Automatic Number Identification can be programmed into the GMH radio for use with inter-connect telephone and other systems requiring users to identify before allowing use of the system.

User Selected Scan List

Press the ENT button on the keyboard microphone to add the selected channel to the scan list. The SCN annunciator appears on the display for each channel entered in the scan list. Press the CLR button on the keyboard microphone to remove (clear) the selected channel from the scan list. This can be accomplished during Channel Scan operation to remove an unwanted channel.

User Selected Priority Channel

Press the PRI button on the keyboard microphone to make the current channel the fixed priority channel. The PR annunciator appears on the display. This occurs in priority scan modes B, C, and D, but not A. See "Priority Scan" on page 3-11.

USER SELECTED CODE GUARD

When the frequencies are programmed for each channel in the radio, a receive Code Guard value and a transmit Code Guard value may also be entered for each channel. The Code Guard values for channels 1-9 can be copied to a another channel in the radio. For example, to use the Code Guard values of Channel 9 with the frequencies of Channel 5:

1. Tum off the SCN and PRI buttons.
2. Set the Channel Selector knob to Channel 5.
3. Press the 9 key on the keyboard microphone. The CG annunciator appears on the display to indicate that the Code Guard has been changed from its original programming.
4. Press the 0 key to reset all values to the original settings, or press a different number key to select a different set of Code Guard values.

In numeric mode, the display shows the selected channel (Ch 5) with the Code Guard value channel (9) to the right. The CG annunciator appears on the display to indicate that the Code Guard has been changed from its original programming.

In alphanumeric mode, the display shows the label for the Code Guard value channel (ALPHA 9) briefly when changing to Channel 5, then the display shows the label for the selected channel (ALPHA 5). The CG annunciator appears on the display to indicate that the Code Guard has been changed from its original programming.

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. Scan operation is indicated on the display by the flashing SCN annunciator (alphanumeric mode) or two flashing bars (numeric mode).

The radio scans all channels in the scan list for activity. When activity is detected, the radio receives the active channel, and the channel name or number appears on the display.

Channels in the scan list are pre-programmed. To determine which channels are in the scan list, select a channel with the channel knob. If it is in the scan list the SCN annunciator appears in the display.

To add or delete the current channel from the scan list, press the SCN button and hold it down for 1 second or more. A beep sounds when the scan list change is executed.

PRIORITY SCAN

Press the PRI button to start or stop priority scanning. Priority scan operation occurs only while the radio is not transmitting. Priority scan operation is indicated on the display by the PR annunciator and either the flashing SCN annunciator (alphanumeric mode) or two flashing bars (numeric mode).

To make the current channel the fixed priority channel, press the PRI button and hold it down for 1 second or more. A beep sounds and the PR annunciator appears when the priority channel change is executed. This occurs in priority scan modes B, C, and D, but not A.

The GMH radio can be programmed with one of four priority scan modes: A, B, C, and D.

Priority Mode A

The channel selected with the Channel Select knob becomes the priority channel as well. When scanning with the PRI button on, the receiver checks the priority channel for activity. If activity is detected by scanning and the receiver stops on a channel other than the priority channel, the receiver continues to check the priority channel for activity. If, in this condition, activity is detected on the priority channel, the receiver receives the priority channel activity for the duration of the transmission, then returns to scanning operation. The yellow Priority Indicator glows during the priority reception. The radio transmits on the channel selected with the Channel Select knob.

Priority Mode B

In priority mode B the priority mode is fixed in programming and indicated by the PR annunciator when the priority channel is selected. Priority operation during scanning is the same as with Priority mode A, except that the priority channel is pre-programmed, not the selected channel. However, with any channel selected other than the fixed priority channel with SCN off and PRI on, the receiver checks the priority channel while receiving on the selected channel. If activity is detected on the priority channel, the receiver switches to receive the priority channel for the duration of the transmission, then returns to the selected channel. The transmitter transmits on the knob-selected channel while operating in priority mode B.

Priority Mode C

In priority mode C the priority channel is pre-programmed. This channel is displayed any time PRI is on, no matter where the Channel Select knob is set. Priority operation during scan operation is the same as with Priority Mode A, except that the priority channel is pre-programmed, not the selected channel. In priority mode C the transmitter always transmits on the priority channel when PR is on.

Priority Mode D

Priority mode D operates exactly like priority mode C. However when PRI is on, the channel name or number displayed is the knob-selected channel, not the fixed priority channel.

BUSY CHANNEL

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

Busy Channel Indication

The yellow Busy Channel Indicator glows if there is carrier activity on the channel selected. If the channel selected is a Code Guard channel and the correct code is not detected, the Busy Channel Indicator remains on for the duration of the carrier activity and no messages are heard. During Channel Scan and Priority Scan operation, the Busy Channel Indicator glows when activity is detected on any channel that is on the scan list. When scanning Code Guard channels, with the CG button on, and activity has been detected, the Busy Channel Indicator glows for the time period necessary to determine if the proper Code Guard has been received, causing the Busy Channel Indicator to flash at various rates. In Priority Scan operation, with the CG button on, the Busy Channel Indicator remains on for the duration of the carrier activity.

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, even if the CG button is not on. 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 is pressed, regardless of whether the CG button is on or off.

Channels not programmed for receive Code Guard operation transmit regardless of carrier activity.

Busy Channel Lockout Override

This mode operates in the same manner as Busy Channel Lockout with the exception that the user can override and transmit by pressing the CG button.