

FIGURE 2-1 INSTALLATION DRAWING  
(Dwg No 155-5654-00 R-4)  
(Sheet 3 of 3)

NOTES:  
1.) RESERVED-CAN BE USED TO CONNECT VARIOUS EXTERNAL OPTIONS SEE SWITCH BOARD SCHEMATIC DVG. 002-6891-XX.

## 2.4 PROGRAMMING

### 2.4.1 INTRODUCTION

There are two basic types of VHF mobile radios offered by BENDIX/KING Mobile Communications. The first are units with an internal keyboard and a display. These will be referred to as the MASTER units. Any MASTER unit can be programmed using its internal keyboard and display. MASTER units are also capable of transferring or receiving their program to or from any other VHF BENDIX/KING mobile or portable. The second type of radio has no keyboard or display. These will be referred to as SLAVES. A SLAVE must be programmed by an external source.

There are three possible techniques for programming:

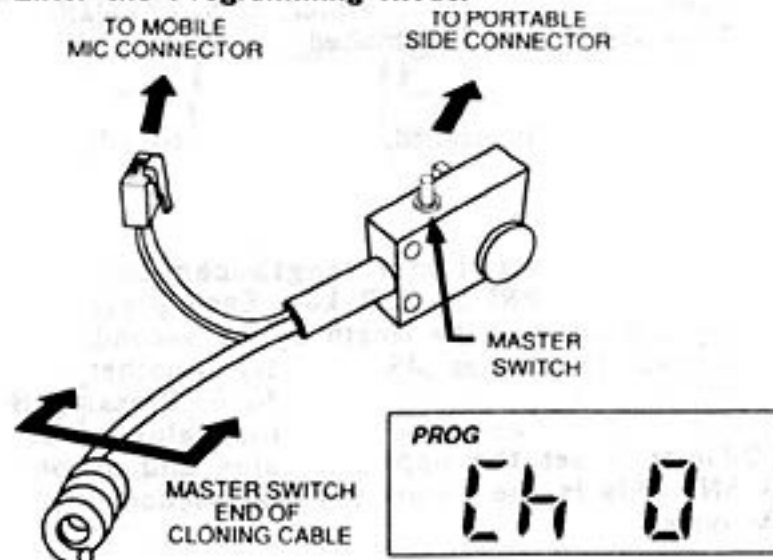
- A MASTER unit can be programmed using its internal keyboard and display.
- Any BENDIX/KING Radio (MASTER or SLAVE) can be cloned from a master unit (mobile or LPH series portable) by attaching a cloning cable (LAA0700) from the MASTER to the CLONE and pressing a download button.
- Any BENDIX/KING radio can be cloned from a computer via a special RS 232 interface.

### 2.4.2 PROGRAMMING A MASTER RADIO THROUGH THE INTERNAL KEYBOARD AND DISPLAY

#### NOTE

To program radios using this method, a LAA 0700 cloning cable must be used.

#### A. To Enter the Programming Mode:

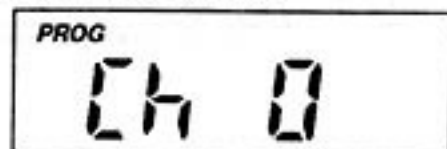


- Make sure that the unit is connected to a power source.
- Insert the programming plug into (the modular telephone style plug) into front panel microphone connector. (Note: The cloning cable will serve as a substitute for the programming plug. The cloning cable has two plugs, the plug with the master switch must be plugged in to the microphone connector.)
- Press and hold master switch.
- While holding the master switch, press the FCN key for approximately three seconds. The display will show PROG Ch 0. The radio is now in the programming mode.
- Release the master switch and FCN key. The radio is now ready to be programmed.

#### B. To Program General Radio Performance Variables (CH 0):

Channel 0 is the portion of the program that controls radio performance variables such as Transmitter Time Out Timer, Scan Delay, Identification Number, Priority Scan Operation, etc.

#### C. To Set the ID Number



- After entering the program mode, the display will show PROG CH 0.

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PROG ID  
135 7296

PROG ID  
2500062

PROG ID  
2500063

**D. To Set the Transmitter  
Time Out Timer**

PROG TX  
0 SEC

PROG TX  
225 SEC

**E. To Set the Scan Delay Time**

PROG SCAN  
2.05EC

2. Press the FCN key.
3. The display will show up to a seven digit ID number. This seven digit number is intended as an electronic serial number for radio system management
- 4a. If no change is needed for the ID number, press FCN to advance to the next section.
- 4b. A new number can be entered by pressing CLR followed by any number up to seven digits. The digits will appear at the right of the screen and move to the left as more digits are entered. Press ENT to store the new ID number and the program will automatically advance to the next section.
- 4c. If desired, the existing ID number can be incremented one digit by pressing PRI. Then press ENT to store the new ID number and automatically advance to the next section.

After the ID number is set, the upper display will show PROG TX. This is the duration of the transmitter Time Out Timer. 0 SEC means that the Time Out Timer is inhibited.

1. If no change is needed, press FCN to advance to the next section.
2. The Time Out Timer length can be changed by pressing the PRI or CLR key. Each press of the PRI key will increase the length by 15 seconds up to 225 seconds (3 minutes, 45 seconds). Another press after 225 seconds resets the value to 0. Pressing the CLR key will automatically reset the value to 0. Press ENT to store the chosen value and automatically advance the program to the next section.

After the Time Out Timer is set the upper display will show PROG SCAN. This is the duration of the scan delay time in seconds.

1. If no change is needed, press FCN to advance to the next section.

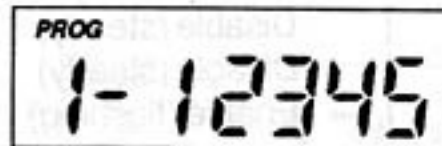
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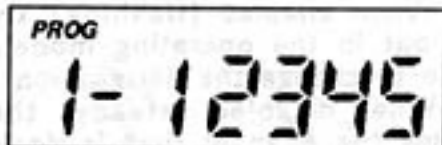
- The scan delay length can be changed by pressing the PRI or CLR key. Each press of the PRI key will increase the scan delay time by .5 seconds up to 7.5 seconds. Another press after 7.5 seconds resets to 0. Pressing the CLR key will automatically reset the value to 0. Press ENT to store the chosen value and automatically advance the program to the next section.

Note: It is not recommended to leave the scan delay time at 0 seconds.

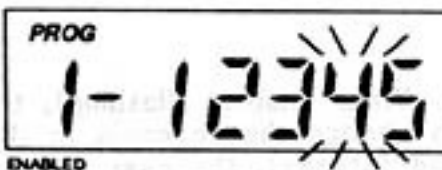
F. Miscellaneous Channel O Programming - GROUP 1



After the scan delay time is set the display will show PROG 1-12345. This is a group of five individual functions that can be enabled or disabled.

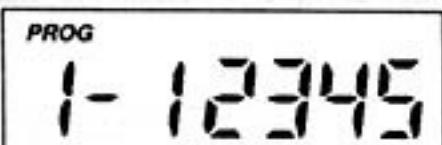


When a function is enabled, the corresponding number in the display will flash. When the function is disabled the number is steady. If you wish to change the function from enable to disable or vice versa, press the number key corresponding to that function.

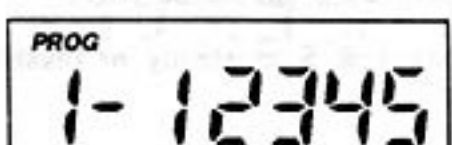
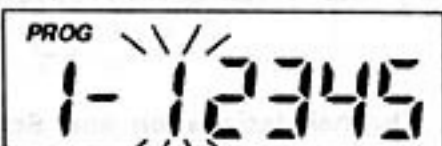


Example: If function #4 (Priority Key Lockout) is disabled, the 4 in the display will not be flashing. If the 4 key is pressed, the 4 in the display will flash signifying that Priority Key Lockout is enabled. A subsequent press of the 4 key will return Priority Key Lockout to a disabled status.

G. GROUP ONE Functions



- Battery Saver Inhibit - The battery saver should be turned off (flashing) to get proper unit operation. Leaving the battery saver option enabled (not flashing) in mobile units might cause poor unit performance.



2. Functions 2 and 3 are used to define Priority Scan operation. There are three types of Priority Scan available. Their operational characteristics are thoroughly discussed in Section 3.2.6 D and E of this manual. In summary:
- 3.



Priority Mode A - The Priority Channel follows the position of the channel select knob.

Priority Mode B - The Priority Channel is fixed. You will transmit on the channel selected by the channel select knob channel.

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**Priority Mode C** - The Priority Channel is fixed. When the PRI toggle switch is on, you will transmit on the Priority Channel regardless of the channel select knob setting.

To set Function 2 and 3 for Priority Mode A, B, or C, use the following chart:

	FUNCTION 2	FUNCTION 3
Priority Mode A	Disable (steady)	Disable (steady)
Priority Mode B	Enable (flashing)	Disable (steady)
Priority Mode C	Enable (flashing)	Enable (flashing)



4. **PRI Key Lockout**- When enabled (flashing) the PRI key will be locked out in the operating mode. The user will not be able to change the designation of the Priority Channel. When disabled (steady) the user will be able to change the channel that is designated as Priority Channel.



See Section 3.2.5 E for instructions on changing the Priority channel.



5. **Scan List Lockout** - When enabled (flashing), the user will not be able to change the channels in the scan list. When disabled (steady), the user can enter or delete channels from the scan list.



See Section 3.2.5 C for instructions on changing the scan list.

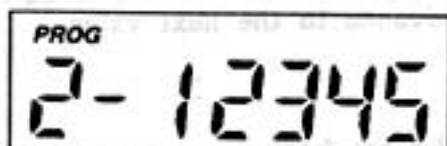
Once each function 1-5 is set as desired, press ENT to store them into memory and automatically advance the program to the next section.

**Note:** The Priority Channel designation and Scan List cannot be changed in the programming mode. If the user is not allowed to have access to choose the Priority Channel or the ability to change the Scan List, the following procedure should be used.

1. Set Group 1 functions 4 & 5 to steady or disabled.
2. Press ENTER
3. Go out of the programming mode by turning the radio off and removing the programming device. Set the priority channel and Scan List as described in paragraph 2.4.4.
4. Return to the programming mode and reset the Group 1 functions 1, 2, 3, 4, and 5 as desired (4 and 5 flashing).
5. Press ENTER to store these selections and proceed with the Group 2 functions.

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H. Miscellaneous Channel 0 Programming - GROUP 2



After group 1 functions are set the display will show PROG 2-12345 for Group 2 functions. As with Group 1 functions, the enabled function number will flash. The disabled functions remain steady.



1. User Code Guard™ Selection

When enabled (flashing) the user will be able to press the keyboard to independently select the CODE GUARD™ values that are programmed into Channels 1 thru 9 while operating on any Channel 1 thru 14. When disabled the user will be unable to use the keyboard for CODE GUARD™ selection. See Section 3.2.5. F for operation procedures of this function.

NOTE: Features 2 thru 5 are reserved for future options and should remain disabled at this time.

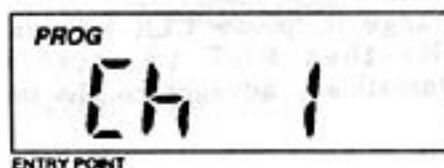
Once Group 2 functions are set, press ENT to store the functions into memory. The display will revert back to the CH0 entry point.

Repeated pressing of the FCN key will display each value in Channel 0, then loop back to the Ch 0 entry point.



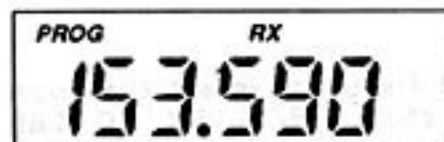
I. To Review Channel 0 Values

J. To Enter Frequencies and CODE GUARD™ Values for Channel 1:

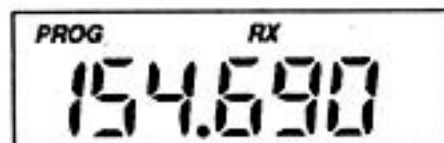


Once Channel 0 programming is complete, the display will show PROG Ch 0. Any channel number can now be pressed to allow access to the frequency and CODE GUARD™ values for that channel.

Note: Each channel must have a valid receive frequency programmed in. If a 0 value or an invalid frequency is programmed, the LCD will give a false reading in the operation mode. Invalid frequencies include all frequencies less than 148.00MHz (including 0.0MHz) and all frequencies above 174.995MHz.

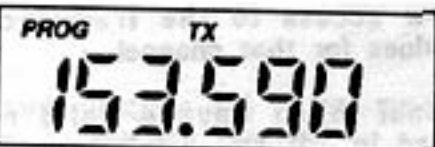


1. Press (1) and the display will show PROG CH 1. This is the entry point for channel 1 values.



2. Press FCN and the upper part of the display will show PROG RX. This is the receive frequency for channel 1 (in MHz).  
3. If the displayed frequency is correct, press FCN to advance to the next value.

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If a new frequency is desired, press CLR followed by the digits of the desired frequency from left to right. Then press ENT to store this frequency and automatically advance to the next value.

See Section 4.3.5 for frequency increments.

4. After the receive frequency is set the upper part of the display will show PROG RX CG. This is the CODE GUARD™ value for Channel 1 receive. Note: 0.0 indicates carrier squelch operation.

If the displayed value is correct, press FCN to advance to the next value.

If a new value is desired, press the CLR key to reset the display to 0.0. Tone CODE GUARD™ is entered directly, using the digit keys (0 thru 9) See Section 2.4.9.

Digital CODE GUARD™ is entered by first pressing CLR, then the (#) key, causing the letter d to appear, followed by three zeros. Enter the desired digital code using keys 0 thru 7 (keys 8 & 9 respond as a 7.) See Section 2.4.9. Pressing the PRI key after the three digit code has been entered allows the digital code to be inverted. When the displayed value is correct, press ENT to store the CODE GUARD™ and automatically advance to the next value.

5. After the receive CODE GUARD™ is set the upper part of the display will show PROG TX. This is the transmitter frequency for Channel 1. If it is correct, press FCN to advance to the next value.

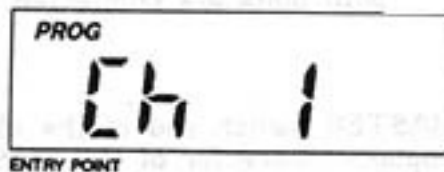
If you wish to change it, press CLR followed by the frequency in MHz then ENT to store the new frequency and automatically advance to the next value.

Only frequencies from 148 to 173.995MHz will be operable. See Section 4.3.5 for frequency increments.

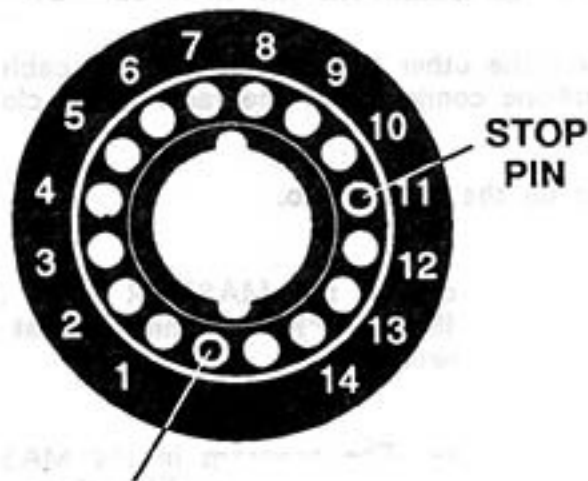
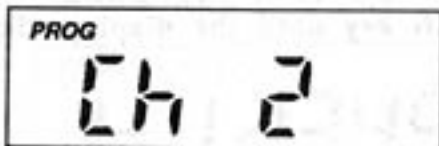
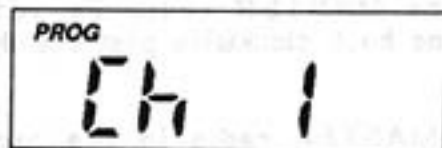
6. After the transmit frequency is set the upper part of the display will show PROG TX CG This is the CODE GUARD™ value for Channel 1 transmit (0.0 indicates carrier squelch). If this value is correct press FCN to advance to the next value.



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**J. To Enter Frequencies and CODE GUARD™ Values for any Channel**



**STOP PIN**

**K. To Leave the Programming Mode:**

If a new value is desired, follow the procedure for receive CODE GUARD™ as described in Step 4.

7. After the transmit CODE GUARD™ is set, the display will loop back to the Channel 1 entry point. If you wish to review the frequencies and CODE GUARD™ values in Channel 1, subsequent pressing of the FCN key will show each value and then loop back to the Channel 1 entry point.

1. After Channel 1 information is set, the display will loop back to show PROG CH 1. Press CLR followed by the digits of any other channel number to gain access to the frequencies and CODE GUARD™ values for that channel. Each channel is then programmed using the same technique as previously outlined for Channel 1.

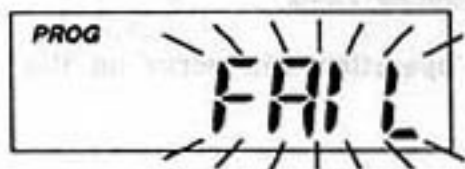
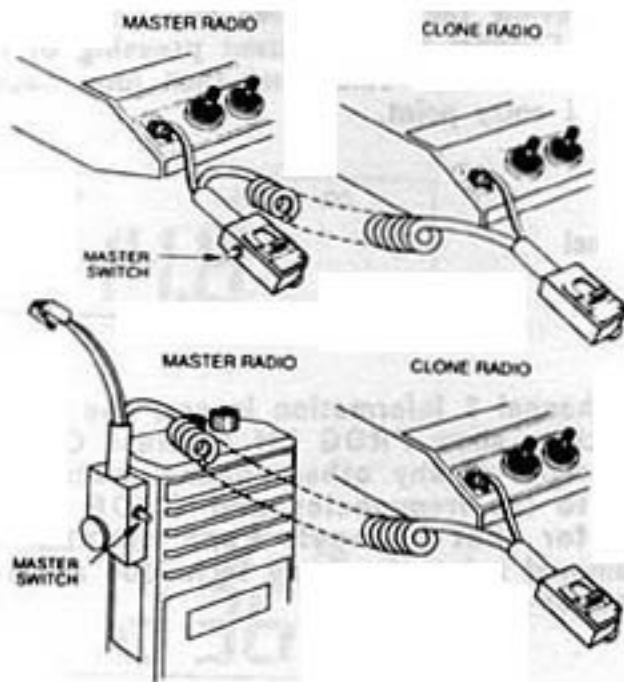
2. After the frequencies and CODE GUARD™ values are entered for each channel, the channel select knob can be modified to limit its travel. The procedure is as follows: Remove the channel select knob from the radio. There are two pins. The pins can be set to limit the travel from two to 14 channels as needed. Place the pins in to the appropriate hole and reinstall the channel select knob. For example, to limit the travel to channels 1-10 set the pins as shown in the illustration to the left.

1. Rotate the On/Off/Volume knob on the front of the radio counter clockwise to the Off position.
2. Remove the cloning cable.
3. Normal radio operation will occur on the next power up.

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### 2.4.3 CLONING A RADIO FROM A MASTER

Any MASTER radio (unit with internal keyboard and display) is capable of transferring its program to another MASTER or SLAVE (unit without keyboard). Note: Both units must be of the same frequency band. The radio receiving the program will be referred to as the CLONE.

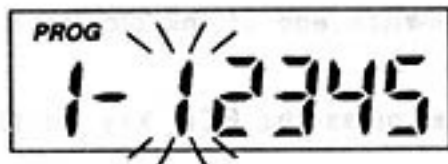
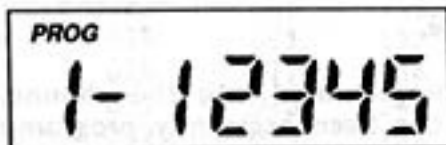


1. Make sure that both units are connected to a power source.
2. Attach the MASTER switch end of the cloning cable into the microphone connector of the MASTER radio. (Note: one plug of the cloning cable has a push button MASTER switch. This plug must be plugged into the microphone connector of the MASTER radio.)
3. Power up the MASTER radio by rotating the On/Off/Volume knob clockwise past the detent.
4. To put the MASTER radio in the programming mode, press and hold the MASTER switch. Then press the FCN key until the display shows PROG CH 0.
5. Review the values in the program. Any changes required must be made at this time.
6. Connect the other plug of the cloning cable into the microphone connector of the radio to be cloned.
7. Power up the clone radio.
8. Press the \* key on the MASTER radio keyboard. The display will flash PROG signifying that the radio is ready to download.
9. Press FCN key. The program in the MASTER will be downloaded to the clone. The clone will send back the program to the MASTER to verify successful cloning.
10. If the download was successful, the MASTER will resume flashing PROG. Power down the clone. Disconnect the cable. Normal radio operation will occur on the next power up.
11. If the download was not successful the MASTER will display FAIL and multiple beeps will follow. Failure to download the MASTER program can be due to:
  - A. Incorrect radio types (VHF tries to program UHF or vice versa).
  - B. Improper connection.
  - C. Failure to power up radio.
  - D. Clone set in programming mode.

Note: To stop fail mode, press CLR, power down the radios, and try again starting at Step 1.

#### 24.4 SPECIAL CLONING INSTRUCTIONS

It is possible to change Channel 0 values on the MASTER radio, hold them in a temporary memory, and download them to the clone without actually entering them into the permanent memory of the MASTER. This is convenient for sequential identification numbers used to identify a series of portables in a radio system. Assuming that the frequencies, CODE GUARD™ values, and other Ch 0 values are common for all radios in the system, but that the radio identification number should be unique to each radio, the following method would be used to clone additional radios for the system:



1. Program the MASTER with all frequencies, CODE GUARD™ values and Channel 0 values that will be common to all radios.
2. Advance the display to show the MASTER's ID number #100 for example.
3. Press CLR; press 1 2 5. #125 is now in temporary memory.
4. Press \*, connect the cable to the radio and download by pressing FCN. ID #125 is now stored in permanent memory of the clone.
5. After download press CLR. Disconnect the clone. The MASTER radio display will show that #125 is still being held in the temporary memory of the MASTER.
6. Press PRI. This will increment the ID number one digit to #126. (Note: any new number can be entered at this point by pressing CLR and using the digit keys to enter the new number.)
7. Press \*. Connect the cable to the second clone and download by pressing FCN.
8. Any number of radios can be coded with different or sequential ID numbers using this technique. The ID number in the permanent memory of the MASTER will remain unchanged as #100.

#### 24.5 SCAN LIST AND PRIORITY CHANNEL CLONING

When a MASTER downloads to a clone, the Scan List and Priority Channel designations are also transferred to the clone. This includes Priority Mode and any lockout functions.

If electing to program a clone with a set Priority Mode, Priority Channel and Scan List along with the respective lockout functions (if desired), the MASTER radio must first be programmed with these parameters. Hence whatever is programmed in the MASTER will be downloaded to the clone radio. See the appropriate operating procedures in Section 3.2 for selecting the Scan List, Priority Channel and Lockout functions. See Section 2.4.2 G for Priority Mode selection.

#### 24.6 CLONING VIA RS 232 INTERFACE

Programming from a computer via the RS 232 interface is covered in a separate programming manual. Contact your BENDIX/KING sales representative and order manual LAA 0705.

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**2.4.7 PROGRAMMING ERRORS**

- A. If the channel selector switch is set to a channel containing an invalid receive frequency, no display indications will appear when power is applied to the radio. If this should occur rotate the channel selector to a channel with a valid receive frequency. The display should come on and normal radio operation will resume.

**NOTE**

Invalid frequencies include all frequencies less than 148.000MHz (including 0.0MHz) and all frequencies greater than 173.995MHz.

Another indication of an invalid frequency programmed into a channel is when the channel selector is rotated and the channel shown in the display does not change.

- B. Display information depends on valid data information being programmed into the channel location of the memory (EEPROM) that is in the radio. When a radio has been accidentally programmed to clear all channel memory locations or if the EEPROM has been replaced due to a required repair, no display indications will appear on any channel when power is applied to the radio. In these situations, data can be entered into the memory (EEPROM) by one of the following methods:

1. Downloading information from an optional radio via the cloning method.
2. Manually blind programming the radio using the following steps:
  - a. With power applied to the radio, insert the master switch end of the cloning cable into the front panel microphone connector.
  - b. While pressing the pushbutton on the cloning cable, press the FCN key on the keyboard. Keep both buttons depressed for 3-5 seconds.
  - c. Press the following keys in the order shown:  
[ PRI ] → [ FCN ] → [ CLR ] → [ 1 ] → [ 5 ] → [ 0 ] → [ ENT ]
  - d. Turn the radio off then back on again ensuring the channel selector is at channel 1. The display should now have a readout and further manual programming can be done.

**2.4.8 SELECTING A TONE CODE GUARD™**

The tone CODE GUARD™ system may be set for any frequency in the range of 67 to 250.3 Hz. However, since most systems adhere to the Electronic Industry Association (EIA) standards, tones should be selected from the following EIA list. In order to insure optimum performance, tone selection for use on the same radio frequency (RF) channel or adjacent channels in the same coverage area should be made from one of the Groups A, B, or C to the maximum degree possible. BENDIX/KING guarantees optimum receiver performance only if tone frequencies below 220 Hz are chosen.

<u>GROUP A</u>		<u>Group B</u>		<u>Group C</u>
67.0	*151.4	71.9	146.2	74.4
77.0	162.2	82.5	156.7	79.7
88.5	173.8	94.8	167.9	85.4
*100.0	186.2	103.5	*179.9	91.5
107.2	203.5	100.9	192.8	
114.8	218.1	*118.8	210.7	
123.0	233.6	127.3	225.7	
131.8	250.3	136.5	241.8	
141.3				

\* 50/60 Hz power distribution systems could cause flashing.

The assignments in a given area shall be made from one of the Groups A, B, or C.

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**2.49 SELECTING A DIGITAL CODE GUARD™**

Codes for the Digital CODE GUARD™ system may be chosen from the following list. Since there are no EIA standards for the performance or compatibility of Digital CODE GUARD™ systems it is recommended that an operational test be made on the intended system before wholesale assignments are made. In some cases either or both the transmit and receive codes will require an inverted code to operate with existing systems. This can be done during the code programming of the system. Usually systems using direct unit to unit transmission (systems without mobile relays, repeaters, remote control, etc) may use codes from the table. Systems with relays etc. may use code variations for system control and operational efficiency. The system operator or engineer should be consulted regarding the operational requirement on such systems.

023	065	131	172	251	331	412	466	612	703
025	071	132	174	261	343	413	503	624	712
026	072	134	205	263	346	423	506	627	723
031	073	143	223	265	351	431	516	631	731
032	074	152	226	271	364	432	532	632	732
043	114	155	243	306	365	445	546	654	734
047	115	156	244	311	371	464	565	662	743
051	116	162	245	315	411	465	606	664	754
054	125	165							

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SECTION III  
OPERATION

3.1 INTRODUCTION

This section contains basic operating procedures for the LMH mobile VHF FM Transceivers. Information on programming and installation is contained in Section 2 of this manual.

WARNING

DO NOT OPERATE THIS UNIT IN CLOSE PROXIMITY TO BLASTING CAPS. DO NOT OPERATE THIS RADIO IN AN EXPLOSIVE ATMOSPHERE (PETROLEUM FUELS, SOLVENTS, DUST, ETC).

3.2 OPERATION

3.2.1 BASIC OPERATION

A. Receive (Listen)

Turn power on by rotating the Volume knob clockwise past the OFF detent. Select the appropriate channel using the Channel Select Knob. Rotate the Squelch knob clockwise until a rushing noise is heard. Set the volume to a comfortable level. Then rotate the Squelch knob backwards (counter-clockwise) until the noise stops. This is called the threshold squelch setting. Further rotation counter-clockwise tightens the squelch setting, making it necessary for stronger signals to open the squelch and allow a message to be heard.

B. Transmit (Talk)

Press and hold the microphone PTT (push to talk) switch. The Transmit LED will glow RED or the LCD indicator will show TX when the transmitter is on. Talk in a normal voice with the microphone 1 - 2 inches from your lips. Make each transmission as brief as possible. Release the PTT switch to end transmission. If the Transmit indicator does not operate when you press the PTT switch and a tone is heard, you are on a receive only channel. Switch the channel selector to an authorized transmit channel. If the length of your message exceeds the preset Time Out Timer setting, the transmitter will automatically shut off and a tone will be heard. If you wish to continue this transmission, release the PTT, then press, hold, and continue talking.

3.2.2 CODE GUARD™ OPERATION

CODE GUARD™ allows one radio or group of radios to be selectively called within a system. If your radio has been programmed with CODE GUARD™, use the following receive and transmit instructions.

A. Receive (Listen)

Turn on power by rotating the Volume knob clockwise past the OFF detent. Rotate the Squelch knob clockwise until a rushing noise is heard. Set the volume to a comfortable level, then rotate the Squelch knob completely counter-clockwise, past the detent for CODE GUARD™ operation. A message will be heard only when your CODE GUARD™ is being transmitted.

B. Transmit (Talk)

Before transmitting on CODE GUARD™ channels, monitor the channel by turning the SQ knob clockwise, off the detent. If the channel is not busy, press and hold the microphone PTT (push to talk) switch. The transmit LED will glow RED or the LCD indicator will show TX when the transmitter is on. Talk in a normal voice with the microphone 1 -2 inches away from your lips. Make each transmission as brief as possible. Release the PTT switch to end transmission. Reset the SQ knob to the CODE GUARD™ position.

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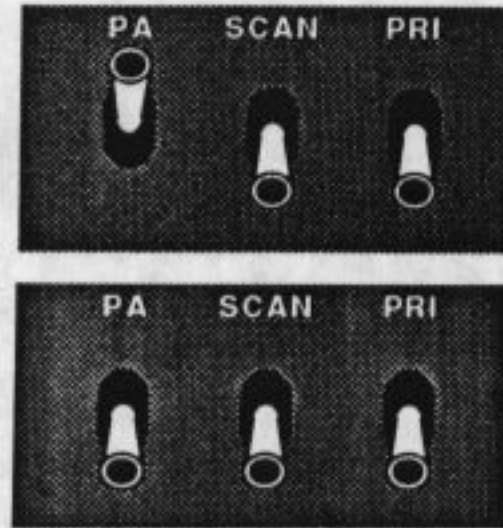
If the Transmit indicator does not operate when you press the PTT switch and a tone is heard, you are on a receive only channel. Switch the channel selector to an authorized transmit channel. If the length of your message exceeds the preset Time Out Timer setting, the transmitter will automatically shut off and a tone will be heard. If you wish to continue this transmission, release the PTT, then press and hold.

### 3.2.3 PUBLIC ADDRESS

The public address function allows use of the radio to send an amplified message through an accessory speaker or horn.

#### A. PA Operation

To send a PA message place the PA toggle switch in the PA position. Press the microphone push-to-talk switch speak in a normal voice with the microphone 1 - 2 inches from your lips. The message will be heard over the external speaker or horn. When the radio is in the PA mode incoming radio messages can still be heard over the radio's built in speaker.



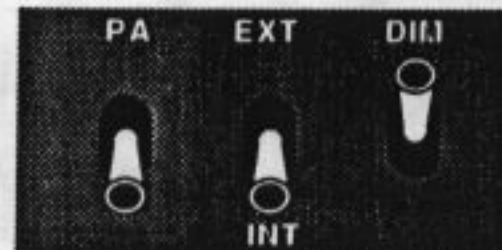
In the off position the radio reverts to normal operation. The mic push-to-talk will enable the transmitter and send a message over the air.

#### B. Internal/External Speaker Selection

Certain models are equipped with an internal/external output selector. With PA on, this switch will choose between two accessory devices, usually one in the vehicle or one external to the vehicle. The public address message can be heard over the chosen device. With PA off, the switch will choose between the two accessory devices. Incoming radio messages can be heard on the device chosen as well as the radio's built-in speaker.

### 3.2.4 DIM SELECTOR

Certain models are equipped with a dim switch. In the dim position the front panel LED indicator's will operate with reduced intensity for night driving or use.



### 3.2.5 BUILT IN FEATURES ON SELECT MODELS

Select BENDIX/KING radios are based on a microprocessor core that allows extra features and operational characteristics to be built in to the radio. Your dealer will define the best operational settings for your system and program them into the radio.

Additional transmit and receive frequencies, up to 14, 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.

The radio comes equipped with a Time Out Timer. This is used to limit the duration of calls and to guard against accidental PTT locking on the transmitter and tying up the radio system. The duration of the Time Out Timer can be changed by your dealer. (0-3.75 min)

A SCAN delay is included to allow a response to a transmission to be received before the scanner moves on to search for new 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)

There are three different priority modes available. These are discussed in the priority section of this manual. Your dealer can help you choose the best one for your system needs.

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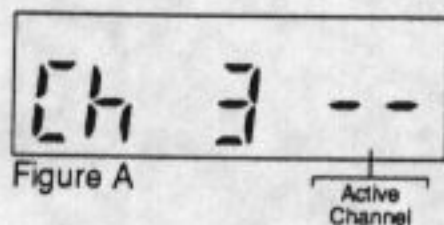
3.2.6 OPERATIONAL FEATURES AVAILABLE ON SELECT MODELS

A. SCAN OPERATION

When in the Scan Mode, the radio receiver samples channels in a predetermined list (Scan List) looking for activity. If an active channel is found, the scanning action stops and the message on that channel is heard. Once the message stops, the receiver will wait for a response before scanning resumes. This waiting period is called the Scan Delay Time. It has been preset (from 0 seconds to 7.5 seconds) by your dealer. The Scan List has also been preset. On some radios you will be able to add or delete channels from your Scan List. The channel that the Channel Selector Knob is set to is always included in the scan list.



To begin scanning, place the SCAN toggle switch in the SCAN position. Scan operation occurs only while the radio is receiving. After SCAN is enabled, two flashing bars on the right side of the display (Figure A) indicate that the radio is scanning the channels in the Scan List.



When a signal is detected, scanning stops and the signal being received is heard, with the active channel shown on the right side of the LCD display. (Figure B) The radio receiver stays on that channel until activity ceases and resumes scanning after the scan delay time.



If you wish to transmit on the last active scan channel (right side of display), turn the Channel Select Knob to match that channel. The channel numbers in the display will now match. (Figure C) Turn OFF the SCAN toggle switch for normal talk-listen operation.



When the PTT is pressed while in the scan mode, the radio transmits on the transmit (left side of display) channel. Upon release of PTT, the radio receiver will hold on that channel. If no activity occurs during the scan delay time, the radio resumes scanning.

B. SCANNING CODE GUARD™ CHANNELS

To scan for channels with programmed CODE GUARD™, rotate the SQ knob completely counter-clockwise past the detent. When a signal is detected, scanning stops and the CODE GUARD™ for that channel is checked. If the proper CODE GUARD™ is present, the radio receives that channel until CODE GUARD™ ceases. If the proper CODE GUARD™ is not present the radio receiver will resume scanning immediately.



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### C. CHANGING THE SCAN LIST

Your radio has been programmed with a permanent or changeable Scan List. If your Scan List can be changed, use the following steps to enter or clear channels.

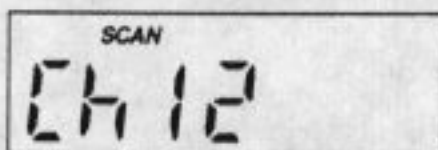
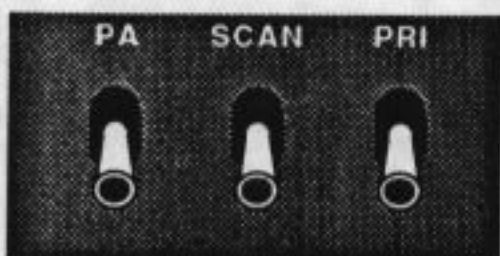


Figure D



To avoid confusion, turn OFF the PRI and SCAN toggle switches.

Turn the Channel Select Knob to the channel to be entered or cleared.

To ENTER a channel into the scan list, press the ENT key on the keyboard. A short beep will be heard. SCAN will be shown in the LCD display. (Figure D)

To CLEAR a channel from the scan list, press the CLR key. A short beep will be heard, and the SCAN in the display will disappear.

### D. PRIORITY OPERATION

Priority operation consists of receiving on any channel while still monitoring for a message on the priority channel. Priority can also be used in combination with Scan operation.

#### NOTE

The Priority Scan feature samples only the carrier frequency and does not sample the CODE GUARD™ signal.

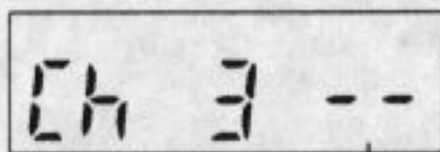


Figure E

When the PRI (priority) toggle switch is turned ON, the channel designated priority is sampled 4 times a second, regardless of activity on any other channel. Two flashing bars on the right hand side of the display indicate that the radio is sampling the priority channel. (Figure E) If a signal is received on the priority channel, the radio receiver will lock on to this channel for the duration of the transmission.

When the SCAN toggle switch is ON and the PRI toggle switch is OFF, normal scanning will occur but the priority channel will not be sampled. If both scan and priority toggles are off, the radio will function as in basic operation.

There are three priority modes; one has been preset by your dealer:

Priority Mode A - The priority channel is tied to the Channel Select Knob. When the selector is set on Channel 5, this is the Priority Channel. If the selector is switched to Channel 8, this becomes the Priority Channel. You will transmit on the frequency chosen by the Channel Select Knob.

Priority Mode B - The Priority Channel is fixed. You will transmit on the frequency chosen by the Channel Select Knob.

Priority Mode C - The Priority Channel is fixed. When the PRI toggle switch is ON, you will transmit on the Priority Channel regardless of the Channel Select Knob setting.

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If you do not know which priority mode is preset for your radio, the following steps will identify it.



1. Set the PRI and SCAN toggle switches to OFF.
2. Rotate the Channel Select Knob, stopping at each detent to view the LCD Display.
3. If a PR symbol does not appear in the upper left of the LCD Display for any channel, you have priority Mode A.
4. If PR is displayed (Figure F), rotate the Channel Select Knob to a different channel, then turn the PRI toggle ON.



Figure F

If the LCD Display doesn't show PR, you have priority Mode B. If the LCD Display changes and PR appears, you have priority Mode C.

Priority Mode A Details:

In this mode, the priority channel is tied to the Channel Select Knob. When the SCAN and PRI (priority) Toggle Switches are ON, scanning will occur until an active channel is found. The radio will receive the active channel (Figure G) while continuing to sample the priority channel 4 times per second. If during this sampling the



Figure G

priority channel becomes active, the radio receiver will go to the priority channel and hold for the duration of the transmission. (Figure H) The priority channel will be shown on the right hand side of the display. If you wish to reply to a message on the priority channel, press the PTT and you will transmit on the priority channel. Once activity ceases on the priority channel, the radio returns to scan operation.

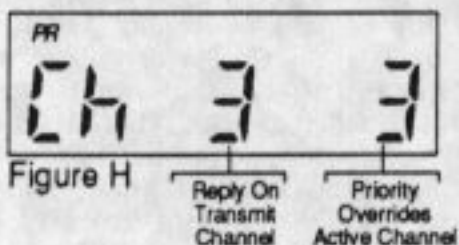
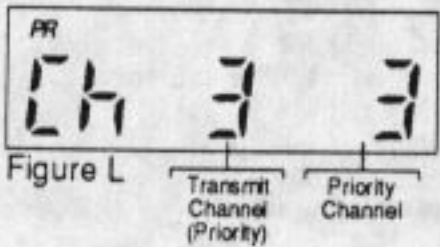
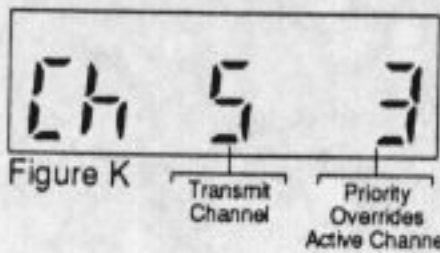


Figure H

Priority Mode B Details:

This mode fixes one channel in the radio as the priority channel. With the SCAN toggle switch OFF and PRI (priority) toggle switch ON, the radio can receive on the Knob Selected Channel while still sampling the priority channel. If the priority channel becomes active, the radio holds on the priority channel for the duration of the transmission. If you wish to reply to a message on the priority channel, you must rotate the Channel Select Knob to the priority channel, then transmit.

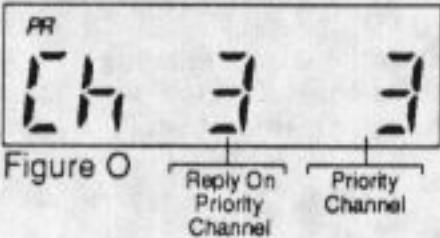
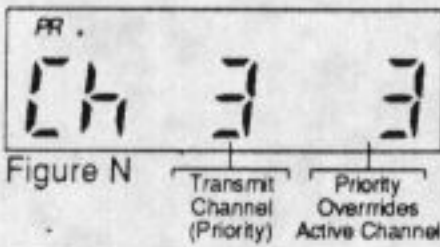
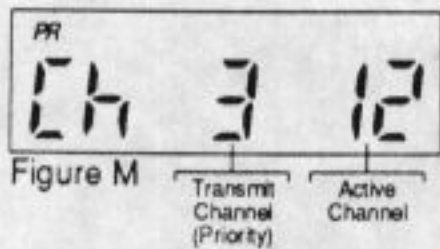
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With both SCAN and PRI toggle switches ON, normal scanning operation will occur until the scanner locks on to an active channel. (Figure J) The priority channel will continue to be sampled 4 times per second while the radio is listening to this active channel. If activity occurs on the priority channel, the radio will override the active scan channel and will tune to the priority channel, and hold for the duration of the transmission. (Figure K) If you wish to reply to a message on the priority channel, you must rotate the channel selector to the priority channel, then transmit. (Figure L) Once activity has ceased on the priority channel, the radio returns to scan operation.

Priority Mode C Details:

With the PRI toggle switch ON and SCAN switch OFF, radio operation is exactly the same as in Mode B. The fixed priority channel is sampled 4 times a second. If activity occurs on the priority channel, the radio will go to the priority channel and hold for the duration of the transmission. If you wish to reply to a message heard on the priority channel, press the push to talk and the radio will automatically transmit on the priority channel regardless of the setting of the Channel Select Knob. In Priority Mode C the radio will always transmit on the priority channel if the PRI toggle switch is ON. Once activity has ceased on the priority channel, the radio will return to the Channel Select Knob receive channel.



With both SCAN and PRI toggle switches ON, the radio will scan until it locks on to an active channel. (Figure M) The priority channel will continue to be sampled 4 times a second while the radio is listening to this active channel. If activity occurs on the priority channel, the radio will override the active scan channel, go to the priority channel and hold for the duration of the transmission. (Figure N) If you wish to reply to a message on the priority channel, press the PTT and the radio will automatically transmit on the priority channel, regardless of the setting of the Channel Select Knob. In priority Mode C the radio will always transmit on the priority channel if the PRI toggle switch is on. (Figure O) Once activity ceases on the priority channel, the radio returns to scan operation.

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E. TO CHANGE THE PRIORITY CHANNEL

The fixed Priority Channel used in Priority Mode B and C may be permanently set by your dealer or may be changeable. If your radio has changeable priority, use the following steps to make this change. NOTE: Only one channel can be designated as the Priority Channel.

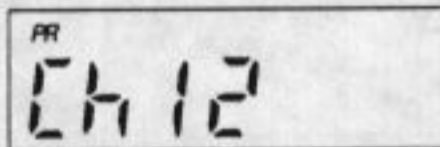
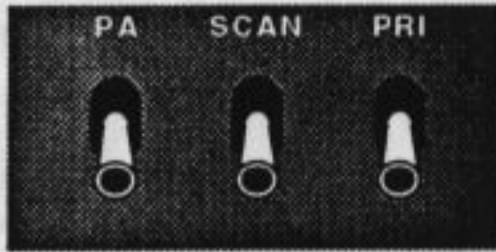
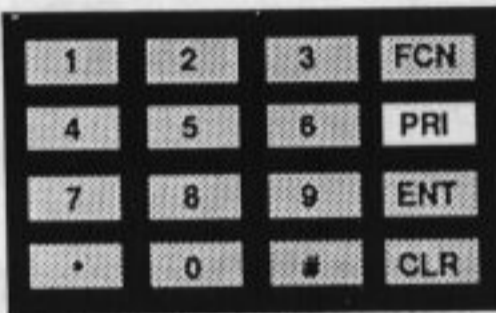


Figure P



1. To avoid possible confusion, turn OFF the PRI and SCAN toggle switches.
2. Turn the Channel Select Knob to the channel that you wish to enter as the new Priority Channel.

A press of the PRI key causes a short beep, with the letters PR displayed, indicating that the displayed channel is now the Priority Channel. (Figure P)

A channel can be both a Priority and a scanned channel. Due to multiple sampling of the same channel, maximum performance occurs when the Priority Channel is not also a scan channel.

F. USER CODE GUARD™ SELECTION

Certain BENDIX/KING radios allow user selection of CODE GUARD™ values independent of the rotary channel selector setting. This is accomplished using the keyboard. The radio has been programmed by your dealer to enable or disable this feature. The programming has also assigned a transmit frequency and CODE GUARD™ and a receive frequency and CODE GUARD™ to each position shown on the rotary channel selector. The CODE GUARD™ values for Channels 1-9 can be pulled away from their normal pairing and matched with any of the other frequencies in the radio.

For example, to use the CODE GUARD™ values of Channel 9 with the frequencies of Channel 5:

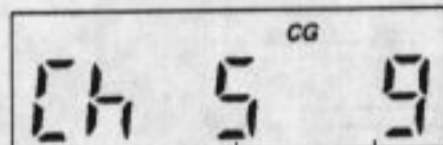
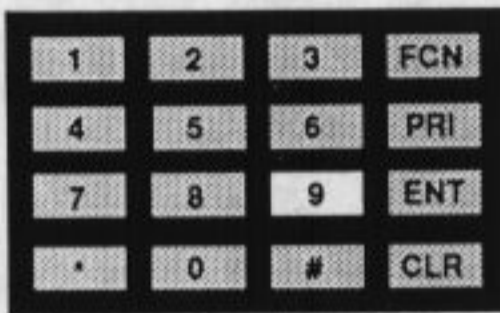


Figure Q

Transmit  
Receive  
Channel

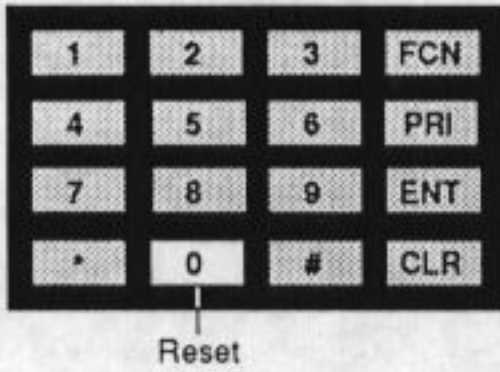
Code  
Guard  
Values

1. Set the rotary channel selector to Channel 5.
2. Press the 9 key on the front panel keyboard. The radio will now operate on the frequencies of Channel 5 with Channel 9 CODE GUARD™ values. During normal operation, the LCD will show 2 numbers: the transmit/receive channel on the left (5) and the selected CODE GUARD™ values on the right (9) with the CG symbol. The display will not show selected CODE GUARD™ values in scan or priority scan mode.

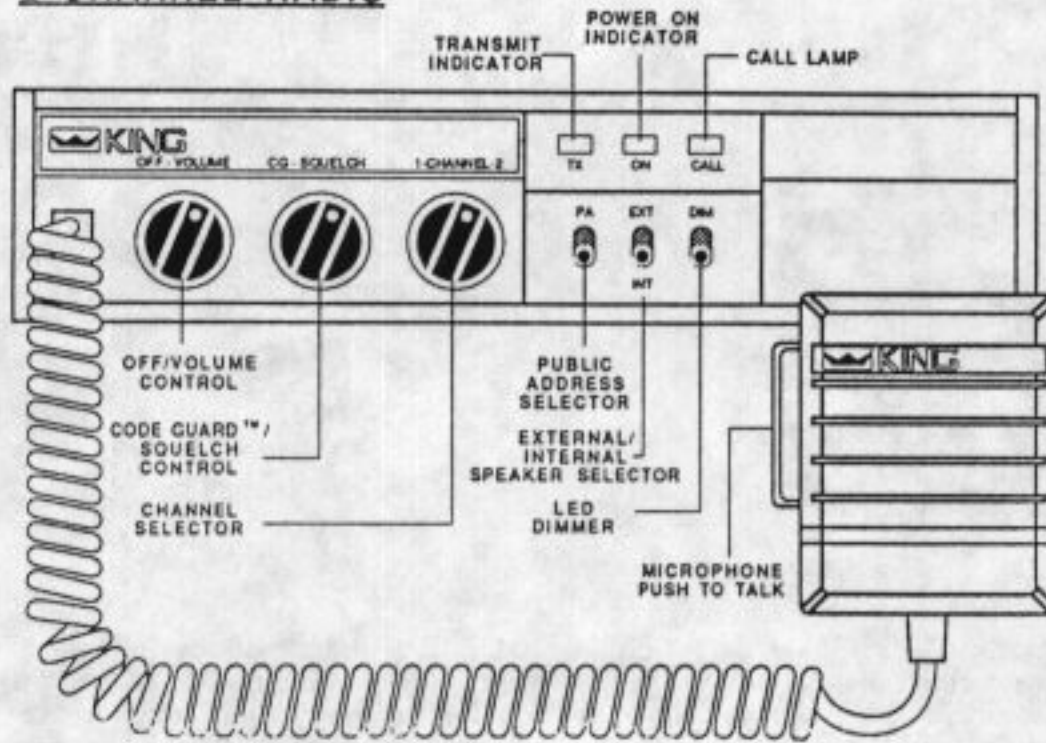
NOTE: Once a CODE GUARD™ value has been selected by the keyboard it will not change even if power is interrupted or if the rotary channel selector is changed.

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- Press the 0 key to reset all values to the original programming. Or press a different digit key (1-9) to select a new set of CODE GUARD™ values.



2 CHANNEL RADIO



14 CHANNEL RADIO

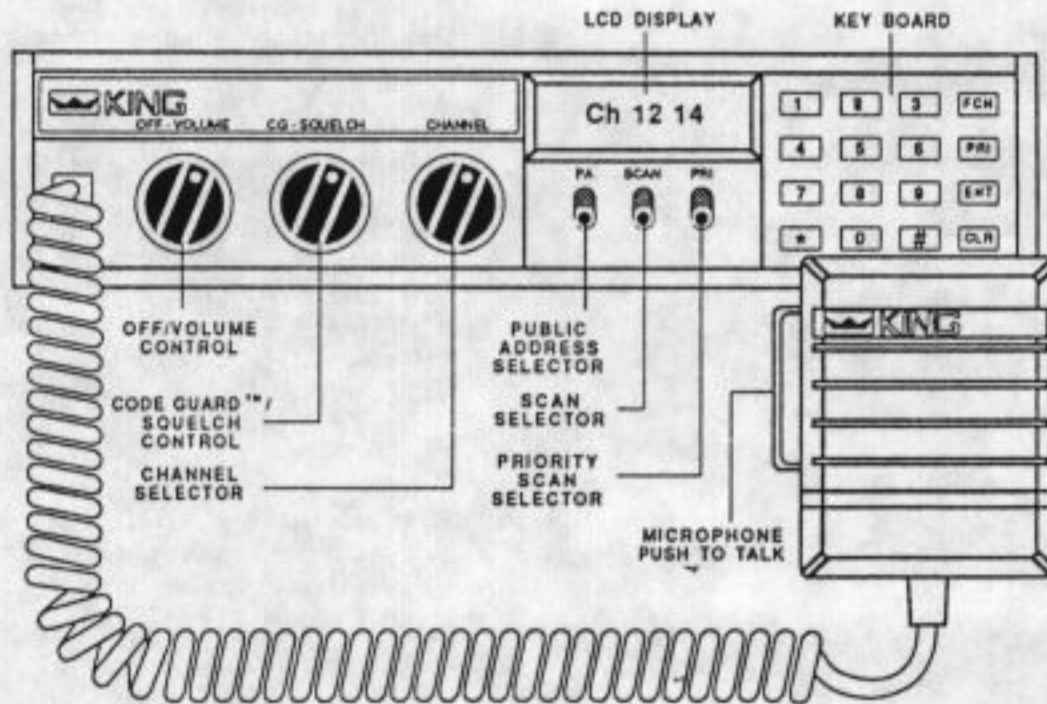


FIGURE 3-1 LMH CONTROLS