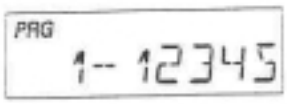
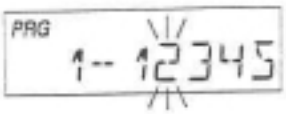
B. PRIORITY SCAN

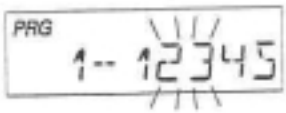
Functions 2 and 3 are used to define Priority Scan operation. There are three types of Priority Scan available. They are described in greater detail under "Priority Operation" beginning on page 3-5. Priority Scan modes include:



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



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

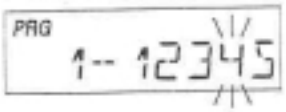


Priority Mode C - The Priority Channel is fixed. When the **PRI** toggle switch is on, you will transmit on the Priority Channel regardless of the Channel Selector knob setting.

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)

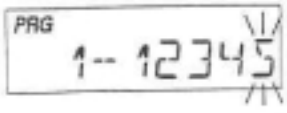
C. PRI KEY LOCKOUT



When function 4 is enabled (flashing) the **[PRI]** key is locked out in the operating mode. The user will not be able to change the designation of the Priority Channel.

When function 4 is disabled (steady) the user will be able to change the channel that is designated as Priority Channel. See "Changing the Priority Channel" on page 3-8.

D. SCAN LIST LOCKOUT



When function 5 is 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 "Changing the Scan List" on page 3-5.

E. STORE GROUP ONE SETTINGS

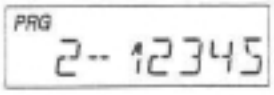
Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group One functions (steady).

Press the **[ENT]** key to store new Group One settings into memory and advance to the next section.

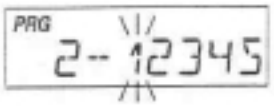
Press the **[FCN]** key to advance to the next section without saving changes or if the new settings are only to be cloned, not stored locally.

2.3.4 CHANNEL 0 GROUP TWO FUNCTIONS



After Group One functions are set, the LCD will display **PRG 2-12345** for Group Two functions. As with Group One functions, the enabled function number will flash. The disabled functions remain steady.

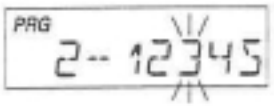
A. USER CODE GUARD SELECTION



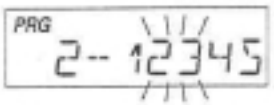
When function 1 is enabled (flashing) the user will be able to press the keyboard to independently select the Code Guard values that are programmed into Channels 1 thru 9 while operating on any Channel 1 thru 14. When disabled the user will be unable to use the keyboard for Code Guard selection. See "User Code Guard Selection" on page 3-8.

B. BUSY CHANNEL OPERATION

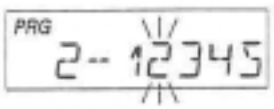
Functions two and three are used to set Busy Channel operation. There are three types of busy channel operation available. They are described more fully under "Busy Channel Indication" on page 3-9. Busy Channel modes include:



Busy Channel Indicator - The yellow LED illuminates when a signal is received on the channel selected, with or without the programmed receive Code Guard setting.



Busy Channel Lockout - The yellow LED illuminates and the transmitter PTT is disabled when a signal is received without the programmed receive Code Guard setting.

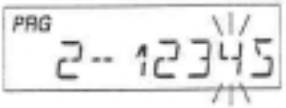


Busy Channel Override - This function is similar to Busy Channel Lockout except the transmitter PTT can be activated by rotating the Squelch knob clockwise off the Code Guard detent.

To set Busy Channel operation use the following chart:

	FUNCTION 2	FUNCTION 3
BUSY CHANNEL INDICATION	DISABLE (STEADY)	ENABLE (FLASHING)
BUSY CHANNEL LOCKOUT	ENABLE (FLASHING)	ENABLE (FLASHING)
BUSY CHANNEL OVERRIDE	ENABLE (FLASHING)	DISABLE (STEADY)

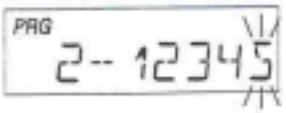
C. ANI ENABLE



When function 4 is enabled (flashing) the ANI ID number will be transmitted (as a DTMF tone sequence) with each press of the PTT switch. See "Automatic Number Identification (ANI)" on page 2-4 for instructions on setting the ANI number..

When functions 4 and 5 are both enabled (flashing) the ANI tone sequence will be transmitted only after the **[ENT]** key is pressed while the transmit PTT switch is activated. A sidetone of the ANI number transmitted will also be heard through the speaker.

D. DTMF ENABLE



When function 5 is enabled (flashing) the keypad becomes active for manual DTMF operation.

E. STORE GROUP TWO SETTINGS

Once Group Two functions are set, press the **[ENT]** key to store them into memory and automatically advance the program to the next section. Alphanumeric displays advance to Group Three settings. Standard 7-Segment displays go back to the starting point for Channel 0 settings.

Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group Two functions (steady).

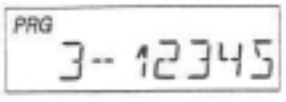
Press the **[ENT]** key to store new Group Two settings into memory and advance to the next section.

Press the **[FCN]** key to advance to the next section without saving changes or if the new settings are only to be cloned, not stored locally.

NOTE: If programmed settings are to be cloned (not stored locally) proceed with the cloning procedure before advancing to the next section. Otherwise, these settings will be lost. See "Cloning Radio Settings" on page 2-15.

NOTE: Group Three settings, Alphanumeric display functions, group labels, and channel labels cannot be transferred by cloning.

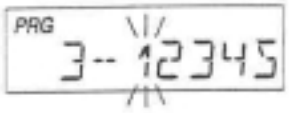
2.3.5 CHANNEL 0 GROUP THREE FUNCTIONS (ALPHANUMERIC DISPLAY ONLY)



After Group Two functions are set, the LCD will display **PRG 3-12345** for Group Three functions. As with Group One and Group Two functions, the enabled function number will flash. The disabled functions remain steady.

Group three functions are available only with Alphanumeric displays.

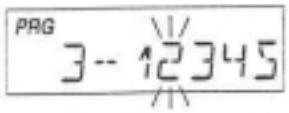
A. BACKLIGHT ON MAIN CHANNEL ACTIVITY



When function 1 is enabled (flashing) the LCD backlight will illuminate each time the display receives input related to the main channel. This includes displayed changes in the selected channel and the PR, TX, and SCN annunciators.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

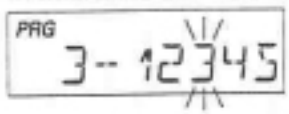
B. BACKLIGHT ON SCAN CHANNEL ACTIVITY



When function 2 is enabled (flashing) the LCD backlight will illuminate each time the display receives input related to the scan channel. This includes displaying the scan channel and the CG annunciator.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

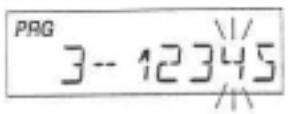
C. BACKLIGHT ON OTHER DISPLAY ACTIVITY



When function 3 is enabled (flashing) the LCD backlight will illuminate each time the display receives input not related to the main or scan channel. This is not used often, but includes the - - - **Id** prompt for password input.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

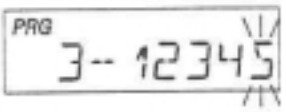
D. BACKLIGHT ON KEY PRESS



When function 4 is enabled (flashing) the LCD backlight will illuminate each time a key is pressed on the keypad, even if pressing the key has no other effect.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

E. ALPHANUMERIC MODE



When function 5 is enabled (flashing) the LCD operates in Alphanumeric mode, enabling display of channel labels. When disabled (steady) the LCD operates in standard (7-segment) display mode. This disables display of channel labels.

F. STORE GROUP THREE SETTINGS

Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group Three functions (steady).

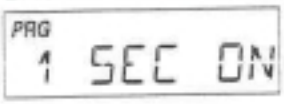
Press the **[ENT]** key to store new Group Three settings into memory and advance to the next section.

Press the **[FCN]** key to advance to the next section without saving changes.

2.3.6 ALPHANUMERIC DISPLAY FUNCTIONS (ALPHANUMERIC DISPLAY ONLY)

The following Display Functions are available only with Alphanumeric displays.

A. BACKLIGHT DURATION



After Group Three functions, the LCD displays the current backlight duration setting. Available settings are **LITE OFF**, **1 SEC ON**, one second increments up to **6 SEC ON**, and **LITE ON**.

If no change is needed, press the **[FCN]** key to advance to the next section.

Press the **[CLR]** key to set backlight duration to zero and display **LITE OFF**.

Press the **[PRI]** key to increase backlight duration by 1 second increments from **LITE OFF**, to **1 SEC ON**, **2**, **3**, **4**, **5**, **6 SEC ON**, **LITE ON** (illumination remains on constantly) then back to **LITE OFF**.

NOTE: The backlight illuminates for the duration of the new setting. For example, if you press the **[PRI]** key to change the setting from **2 SEC ON** to **3 SEC ON** the backlight immediately illuminates for three seconds.

NOTE: Excessive battery drain will result if **LITE ON** is set and used for extended periods of time.

Press the **[ENT]** key to store changes and advance to the next function.

Press the **[FCN]** key to advance to the next function without storing changes.

B. GROUP LABEL

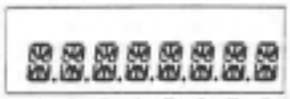
After the Backlight Duration setting, the LCD displays the current label for the channel group. Each channel group can have a label of up to eight characters or spaces. The characters can include 0 - 9, A - Z, -, *, $, /, +, %, \, |, _, <, >, h, or blank.

- If no change is needed, press the **[FCN]** key to go back to the starting point for Channel 0 settings.
- Press the **[CLR]** key to erase the current label.
- Press the **[CLR]** key a second time to restore the current label.

NOTE: Special software available from Bendix/King enables entering group labels and channel labels from a computer. Contact Bendix/King for the programming cable, software, and instruction manual.

CHANGE THE LABEL

1 Press the [CLR] key. The display becomes blank.



2. Press number keys to enter 0 - 9 in positions one through seven. The digits start in position seven, then move left.

3. Press the [#] key to toggle a decimal on or off to the right of the character in position seven. The decimal moves left with the number in position seven as new numbers are entered.

4. Use the following steps to enter a number in position eight, or characters in positions one through eight:

LABEL WITH LETTERS, NUMBERS, ETC.

1. Press the [PRI] key repeatedly to cycle through characters 0 - 9, A - Z, -, *, $, /, +, %, \, |, _, <, >, ñ, blank, then back to the start again.

   If you pass the desired character, press the [PRI] key repeatedly until you return to the start and reach that character again.

2. Press the [FCN] key to shift the display left by one position, leaving position eight blank.

3. Press the [PRI] key repeatedly to enter the next character, or press the [FCN] key a second time to enter a blank space.

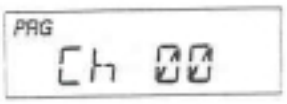
4. To abandon changes, press the [CLR] key, restoring the original label.

5. Press the [ENT] key to store changes and go back to the starting point for Channel 0 settings.

2.3.7 REVIEW CHANNEL 0 VALUES

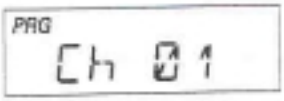
Press the [FCN] key repeatedly to display each value in Channel 0, then return to the Channel 0 starting point.

2.3.8 ENTER CHANNEL FREQUENCIES AND CODE GUARD VALUES

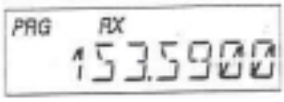


At the starting point for Channel 0, the LCD will display **PRG Ch 00**. At this point, a channel number can now be pressed to allow access to the frequency and Code Guard values for that channel.

NOTE: A valid receive frequency must be programmed into each channel intended for use. If a 0 value or an invalid frequency is programmed, the LCD will give a false reading in the operation mode, and may result in radio malfunction. If a malfunction occurs, reset the radio by turning it off and then back on.



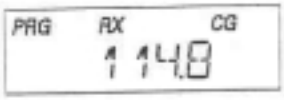
1. Press 1 and the LCD will display **PRG CH 01**. This is the starting point for entering channel 1 values.



2. Press the **[FCN]** key and the upper part of the LCD will display **PRG RX**. This is the receive frequency for channel 1 (in MHz).

3. If the displayed frequency is correct, press the **[FCN]** key to advance to the next value.

   If a new frequency is desired, press the **[CLR]** key followed by the digits of the desired frequency. Then press the **[ENT]** key to store this frequency and automatically advance to the next value.

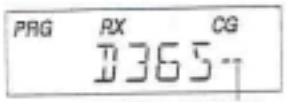


4. After the receive frequency is set, the upper part of the LCD will display **PRG RX CG**. This is the Code Guard value for Channel 1 receive.

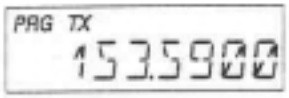
   NOTE: **0.0** indicates carrier squelch operation (no Code Guard).

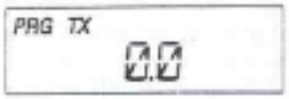
   If the displayed value is correct, press the **[FCN]** key to advance to the next value.

If a new value is desired, press the **[CLR]** key to reset the display to **0.0**. Press the number keys **0** thru **9** to enter a Tone Code Guard value. See "Tone Code Guard Values" on page 2-18.



To enter a Digital Code Guard value press 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 do not respond). See "Digital Code Guard Values" on page 2-18. 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 the **[ENT]** key to store the Code Guard value and automatically advance to the next value.

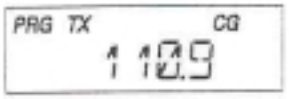




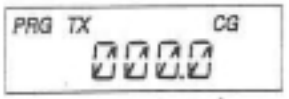
5. After the receive Code Guard is set the upper part of the LCD will display **PRG TX**. This is the transmitter frequency for Channel 1. If it is correct, press the **[FCN]** key to advance to the next value.

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

   Only valid frequencies will be operable.



6. After the transmit frequency is set the upper part of the LCD will display **PRG TX CG**. This is the Code Guard value for Channel 1 transmit (0.0 indicates carrier squelch). If this value is correct press the **[FCN]** key to advance to the next value.

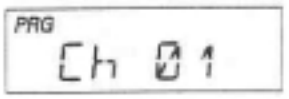


   To enter a new value, press the **[CLR]** key to reset the display to **0.0**. Press the number keys to enter a Tone Code Guard value. See "Tone Code Guard Values" on page 2-18.

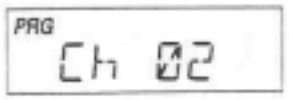
   To enter Digital Code Guard, first press the **[CLR]** key, then the **[#]** key, causing the letter D to appear followed by three zeros. Enter the desired digital code using keys 0 thru 7 (keys 8 & 9 do not respond). See "Digital Code Guard Values" on page 2-18. Pressing the **[PRI]** key after the three digit code has been entered allows the digital code to be inverted. When the displayed value is correct, press the **[ENT]** key to store the Code Guard and automatically advance to the next value.

7. After the transmit Code Guard is set, the LCD will display the channel label. If this label is correct press the **[FCN]** key to proceed to the entry point.

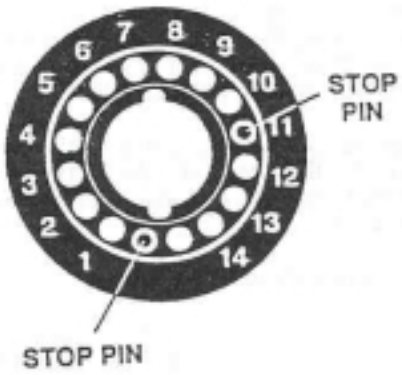
   If a new channel label is desired, follow the instructions under "Change the Label" on page 2-11.



8. After the channel label is set, the display will return to the Channel 1 starting 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 return to the Channel 1 starting point.



9. At the starting point for Channel 1, the display will show **PRG CH 01**. Press the number keys for another channel number to gain access to the frequencies and Code Guard values for that channel. Each channel is then programmed using the same steps described for Channel 1.



10. After the frequencies and Code Guard values are entered for each channel, the Channel Selector knob can be modified to limit it's travel. The procedure is as follows: Remove the Channel Selector 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 Selector knob. For example, to limit the travel to channels 1-10 set the pins as shown in the illustration to the left.

2.3.9 LEAVE THE PROGRAMMING MODE

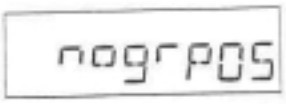
1. Rotate the On/Off/Volume knob on the top of the radio counterclockwise to the Off position.
2. Remove the programming plug.
3. The radio will be in normal operation mode the next time it is turned on.

2.4 GROUP SELECTION

For a 210-channel radio, Channel 0 settings affect one "group" of 14 channels. Each group must be programmed separately. To select a group for programming, perform the following steps:

1. Change the radio from programming mode to normal operation mode by turning it off, then on.

   In normal operation mode, press the [#] key to display the current group number for 5 seconds. Press the [#] key a second time within 5 seconds to display the alphanumeric label for the current group.



2. To select a group to be programmed, press the [#] key followed by number keys for the group number. Enter the selection by pressing the [#] key or the [ENT] key, or by waiting 5 seconds.

   If an invalid group number has been selected (for example, group 5) the LCD will display **no group 05**. To exit this mode either turn the radio off, then on; or enter a valid group number from the keypad.

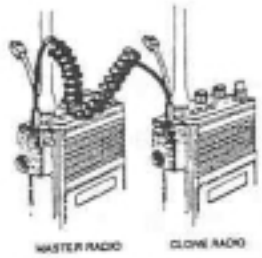
3. Enter the programming mode and set the values. See "Enter Programming Mode" on page 2-2.

   NOTE: The same password code is used for all groups in the radio.

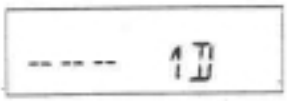
2.5 CLONING RADIO SETTINGS

A radio with a keyboard and display can transfer its programmed settings to another radio by using a cloning cable. A radio cannot transfer Alphanumeric display settings, including channel labels, group labels, and Channel 0 Group Three functions. Both units must be of the same frequency band. For example, an EPH series VHF radio can be used to clone settings to or from an LPH or LMH series radio.

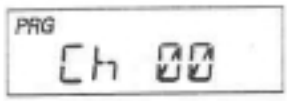
The radio (with a keyboard and display) transferring its programmed settings is referred to here as a Master unit. The radio receiving the programmed settings is referred to here as a Clone unit.



1. Make sure that both units are connected to a charged battery pack.
2. Attach the Master end of the cloning cable into the side connector of the Master radio. This is the cable end with the pushbutton Master switch.
3. Turn on the Master radio.



4. Put the Master radio in the programming mode by holding down the Master switch and pressing the [FCN] key until the LCD displays - - - ID.
5. Enter the correct Password Code.



6. Press the [FCN] key repeatedly to review the values in Channel 0. Make any required changes at this time.
7. Attach the other end of the cloning cable into the side connector of the radio to be cloned.
8. Turn on the clone radio.
9. Press the [*] key on the Master radio. The display will flash **PROG**, signifying that the radio is ready to download.
10. Press the [FCN] key. The program in the Master will download to the clone. The clone will send back the program to the Master to verify successful cloning.

11. If the download was successful, the Master radio will resume flashing **PROG**. Turn off the clone radio. Disconnect the cable. Normal radio operation will occur the next time the clone radio is turned on.

12. If the download was not successful the Master radio will flash **FAIL**, followed by continuous beeps. Failure to download the Master program can be due to:

    A. Incorrect radio types.
    B. Improper connection.
    C. Failure to power up radio.
    D. Clone set in programming mode.

    NOTE: To stop FAIL mode, press the [CLR] key, turn off the radios, and start again at Step 1.

2.5.1 GROUP CLONING

Cloning radios equipped with more than 14 channels (more than one group) can only be accomplished group by group. Settings for any group in a Master radio can be downloaded to any group in the clone radio. To perform group cloning:

1. With the Master radio in normal operation mode, press the [#] key followed by number keys to select the group to be downloaded.
2. Set the clone radio to the group that is to receive the download, using the same method as in step 1.
3. Follow the cloning instructions on page 2-15.

   Only the Channel 0 and channel 1-14 information for the selected Master radio group will be downloaded to the selected clone radio group. Channel 0 Group Three settings, other Alphanumeric settings, and labels cannot be downloaded by cloning.

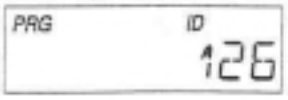
2.5.2 SPECIAL CLONING INSTRUCTIONS

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 radio. 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 radio 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 radio's ID number - for example, 100.

3. Press the [CLR] key; press **1 2 5**. Do not press the [ENT] key. Now 125 is in temporary memory.
4. Press the [*] key, connect the cable to the radio and download by pressing the [FCN] key. ID number 125 is now stored in permanent memory of the clone.
5. After download, press the [CLR] key. Disconnect the clone. The Master radio display will show that 125 is still being held in the temporary memory of the Master radio.



6. Press the [PRI] key. This will increment the ID number one digit to 126. (Note: any new number can be entered at this point by pressing the [CLR] key and using the digit keys to enter the new number.)

7. Press the [*] key. 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 radio will remain unchanged as 100.

2.5.3 SCAN LIST AND PRIORITY CHANNEL CLONING

When a Master radio 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.

To program a clone with a specific 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. The lockout functions cannot be held in temporary memory. See the appropriate operating procedures in Section 3 for selecting the Scan List, Priority Channel, and Lockout functions. See "Priority Scan" on page 2-6 for Priority Mode selection procedures.

2.6 PROGRAMMING BY COMPUTER

Programming a radio from a computer is not covered in this manual. Contact Bendix/King for the programming cable, software, and manual required.

2.7 TONE CODE GUARD VALUES

The tone Code Guard system may be set for any frequency in the range of 67 to 255.9 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.

GROUP A		GROUP B		GROUP C
67.0 (XZ)	*151.4 (5Z)	71.9 (XA)	146.2 (4B)	74.4
77.0 (XB)	162.2 (5B)	82.5 (YZ)	156.7 (5A)	79.7
88.5 (YB)	173.8 (6A)	94.8 (ZA)	167.9 (6Z)	85.4 (YA)
*100.0 (1Z)	186.2 (7Z)	103.5 (1A)	*179.9 (6B)	91.5 (ZZ)
107.2 (1B)	203.5 (M1)	110.9 (2X)	192.8 (7A)	
114.8 (2A)	218.1 (M3)	*118.8 (2B)	210.7 (M2)	
123.0 (3Z)	233.6	127.3 (3A)	225.7 (M4)	
131.8 (3B)	250.3	136.5 (4Z)	241.8	
141.3 (4A)				

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

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

2.8 DIGITAL CODE GUARD VALUES

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