ZETRON

Model 4010 Radio Dispatch Console
Programming Manual

Part No. 025-9229C.1

Please check for change information at the front of this manual.

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1. INTRODUCTION

1. INTRODUCTION

The Model 4010 and 4010R Radio Dispatch Consoles can be easily field programmed by the system maintainer with the Console Programming System (CPS). The keys on the console can be tailor-fit to accommodate a new channel, a new layout, or a new remote function. The menu-driven window interface makes the program intuitive and easy-to-use. Help is available through the use of pop-up help windows.

In this manual both the Model 4010 and 4010R are referred to as the Model 4010 unless specifically stated otherwise.

HARDWARE REQUIREMENTS

To program the Model 4010 using CPS, you will need the following:

- IBM PC-XT, AT or compatible with 384k bytes RAM

- One 5¼- or 3½-inch floppy disk drive

- 25 row x 80 column monochrome MDA or color monitor

- One RS-232 serial port

- Any IBM compatible printer (optional)

VERSION COMPATIBILITY

CPS is a DOS program that can run in Windows. This manual describes how to use CPS to program the Model 4010.

CPSW is a Windows program. For programming with CPSW, see *Model 4010 Radio Dispatch Console Installation and Programming* (P/N 025-9227).

Each version of CPS and CPSW is designed to work with a specific firmware version or range of firmware versions. It is best to use the version of CPS or CPSW that was delivered with your system or your last firmware upgrade. If you need a replacement copy of CPS or CPSW, contact Zetron technical support. They can assist you with acquiring the correct programming software for your specific firmware.

- CPS is supported for firmware versions up to 1.80 only.

- CPSW is supported for firmware versions 1.80 and newer.

DEFINITIONS

The following terms and definitions are used in this manual.

System	The entire Model 4010 Radio Dispatch Console system including the panels, channel cards, and all options.
Panel	A group of similar keys and associated annunciators. The Model 4010 has three key panels, two of which are programmable.
Channel	An individual audio path to an external site, which is under operator control. Each Model 4010 channel card provides two channels.

MANUALS

There are several manuals which describe the operation, installation, service and programming of the Model 4010 Radio Dispatch Console. This manual describes how to use CPS to program the console keys. Table 1-1 lists the Model 4010 manuals and a description of their contents.

Table 1-1. Manuals for the Model 4010 Console

Manual Title	Zetron Part No.	Description
Operator's Manual	025-9226	Presents an overview of the console panels, a description of the functions of each button, and a detailed description of the Model 4010.
Installation Manual	025-9227	Presents a description of how to configure and install the Model 4010 console and accessories, including programming with CPSW.
Programming Manual	025-9229	Describes how to use the Console Programming System (CPS) to program the console keys.

2. INSTALLATION

2. INSTALLATION

TO USE CPS, START HERE

Many software manuals leave you wondering where to begin learning how to use the program. This one does not - start reading below, follow the step by step instructions in Sections 2 and 3, and you will be running the console programming software in a few minutes.

Making a Working Program Diskette (floppy diskette system)

If your system has one or two floppy disk drives, follow the instruction in this subsection to make a working program diskette. If your system has a fixed (hard) disk, read the instructions in the next subsection, Making a Working Directory (fixed disk system).

Due to copyright laws, the program diskette from Zetron does not contain a DOS (disk operating system) and therefore is not bootable. You will need a single blank diskette to format as described below.

1. Insert the IBM DOS diskette in drive A: (label side up) and close the drive door.

2. Make drive A: the default drive by typing A: and pressing the ENTER or RETURN key (looks like ↵).

3. If your machine has two floppy disk drives, skip to step 12.

4. Format the blank diskette by typing FORMAT A:/S and press ENTER. This runs the FORMAT program; the /S tells it to also copy DOS to the new diskette after formatting.

5. The FORMAT program runs and displays "Insert new diskette for drive A:, and strike ENTER when ready". Remove the DOS diskette from drive A:, insert the blank diskette into drive A: and then press ENTER.

6. After a short delay, the diskette is formatted and DOS is transferred. You do not want to format another diskette now, so press N to exit the FORMAT program.

7. Remove the newly formatted diskette from drive A: and insert the CPS master diskette into drive A:

8. Copy the CPS master diskette to the new diskette by typing COPY A: B: and pressing ENTER.

9. The COPY program runs and displays "Insert diskette for drive B: and press any key when ready". Remove the CPS master diskette, insert the newly formatted diskette into drive A:, and press ENTER.

10. After a few seconds the COPY program will prompt you to insert the diskette for drive A:; this means to remove the new diskette, insert the CPS master diskette, and press ENTER. The COPY program may prompt you several times to insert diskette for drive X, you only need to remember that the diskette for drive A: is the CPS master diskette and the diskette for drive B: is the new diskette.

11. Skip to step 17.

12. Format the blank diskette by typing FORMAT B:/S and pressing ENTER. This runs the FORMAT program; the /S tells it to also copy DOS to the new diskette after formatting.

13. The FORMAT program runs and displays "Insert new diskette for drive B:, and strike ENTER when ready". Insert the blank diskette into drive B: and press ENTER.

14. After a short delay, the diskette is formatted and DOS is transferred. You do not want to format another diskette now, so press N to exit the FORMAT program.

15. Copy the CPS master diskette to the new diskette by typing COPY A: B: and pressing ENTER.

16. The COPY program now copies the files from the CPS master diskette to the new diskette.

17. When the files are copied, remove the CPS master diskette from drive A: and store it in a cool, dry, safe place. Hopefully, you will never need it again.

18. Label the new diskette "Zetron Model 4010 CPS"

You have now created a working program diskette. Whenever you want to run the Model 4010 CPS program, type the following:

        A: <ENTER>
        4010 <ENTER>

Making a Working Directory (fixed disk system)
If your system has a fixed disk, follow the instructions in this subsection to make a working directory on your fixed disk. This directory will contain the CPS and the data files the program creates. If your system does not have a fixed disk, read the instructions in the previous subsection, Making a Working Program Diskette (floppy diskette system).

Note: *The following procedure will create a directory named CPS at the root level of your fixed disk.*

1. Insert the CPS master diskette into drive A: (label side up) and close the drive door.

2. Assuming your fixed disk is assigned to drive C:, create the CPS directory by typing MD C:\CPS and then pressing ENTER. If your fixed disk is assigned to a drive other than C:, substitute the correct drive letter in the above command.

3. Copy the CPS master diskette files to your fixed disk by typing COPY A: C:\CPS and then pressing ENTER.

4. When the files are copied, remove the CPS master diskette from drive A: and store it in a cool, dry, safe place. Hopefully, you will never need it again.

You have just created your CPS working directory. Whenever you want to run the Model 4010 CPS program, type the following:

```
CD \CPS <ENTER>
4010 <ENTER>
```

3. TUTORIAL

3. TUTORIAL

INTRODUCTION

This section presents the essential steps needed to run CPS to program a Model 4010. Information about starting the program and navigating through the menus is followed by a step-by-step tutorial that will quickly show you how to create a new channel, define, move and copy console keys, and print reports. How to quit the program is explained at the end of this section.

RUNNING CPS

If you have a floppy diskette system, insert the diskette labeled "Zetron Model 4010 CPS" into drive A:. Make A: the default drive and start running CPS by typing:

> A: <ENTER>
> 4010 <ENTER>

If you have a fixed disk system, just type:

> CD \CPS <ENTER>
> 4010 <ENTER>

The program is now loaded and begins by clearing the screen and displaying the MAIN menu.

CPS MENU AND DATA EDITING KEYS

Before you program your first key on the console, read the following information on how the menus operate and how to edit data in the fields.

Using Menus
The CPS is a menu-driven program, so every task is performed by selecting options from menus. The options are listed below each menu item when it is selected. Each option consists of a descriptive phrase, preceded by a letter or a number. The active menu option is highlighted by an inverse bar.

There are three ways to select menu options:

1. Type the letter or number that precedes the descriptive phrase.

2. If there is no letter or number preceding a menu option, then type the first letter of the descriptive phrase.

3. Use the UP ARROW or DOWN ARROW to move the highlighted menu bar to the desired selection and press ENTER.

Getting Help

At certain points in the program, you may pop-up a help window by pressing the ? (question mark) key. The help window provides information about the input field where help was requested. After reading the help window, press the ESC key to remove the window from the screen and return to the field or menu you were working on.

The ESC Key

Pressing the ESC key returns you from just about every window. Pressing ESC from a menu returns you to the previous menu until the MAIN menu is displayed. The ESC key is also used to cancel in-progress functions such as printing. If you ever panic or get stuck in the program, just press the ESC key until you return to the MAIN menu.

Data Editing Keys

Table 3-1 shows the keys that are used to move the cursor between data fields while editing. The ^ means to also press the CTRL key.

Table 3-1. Keyboard Function Assignment

PC Keyboard Key	Use
Home	Moves cursor to top-left field
Up Arrow (or ^E)	Moves cursor one field up
^Left Arrow (or ^A)	Moves cursor one field left
Left Arrow (^S or Shift TAB)	Moves cursor one character left
Right Arrow (^D or TAB)	Moves cursor one character right
^Right Arrow (or ^F)	Moves cursor one field right
Down Arrow or ^X	Moves cursor one field down
End	Moves cursor to bottom right field

The ^ letter keys are derived from older, text-based, word-processing programs. These keys are easily associated with their functions by examining their locations on the keyboard. The diagram Figure 3-1 highlights these locations.

Control + Key Functions   Equivalent Arrow Key Functions
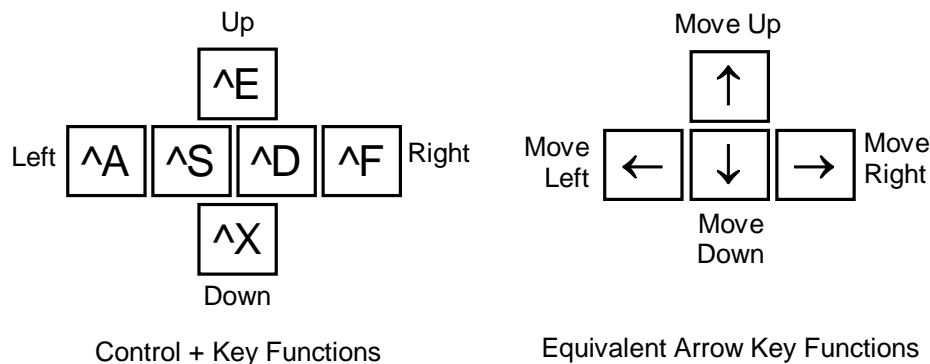
Figure 3-1. Text-Based Cursor Key Functions

The keys listed in Table 3-2 are used to delete or insert data while editing.

Table 3-2. Additional Key Functions

PC Keyboard Key	Use
^G	Deletes character on cursor
Back Arrow ←	Deletes character left of cursor
DEL	Deletes entire field and stores text into delete buffer
INS	Inserts text from delete buffer into current field

CREATING YOUR FIRST CONSOLE CONFIGURATION

The first task in this tutorial is to create a console configuration. First start running CPS as described in the beginning of this section.

When the program displays the MAIN menu, press the N key for New.

The program now prompts you to enter a new system name. Enter a name up to eight characters and press ENTER. Looking at the highlighted status line at the bottom of the screen, you will note that the system name is now displayed.

Press the E key for Edit.

The program will display the EDIT menu (see Figure 3-2).

```
========= ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM=========
  Select [E]   Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help


                                    ┌──────────────────────────┐
                                    │ Position configuration   │
                                    │ System configuration     │
                                    │                          │
                                    │ Selection [P]            │
                                    └──────────────────────────┘
```

Figure 3-2. EDIT Menu

To communicate with external devices (base stations, transmitters, etc.), the Model 4010 system needs to know what kind of channels are connected to it. To define these channels, press the S key from the EDIT menu. This selection will cause the SYSTEM CONFIGURATION menu to be displayed as shown in Figure 3-3.

```
═══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ═══════════
 Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help
```

```
                              ═════════ SYSTEM CONFIGURATION ═════════
                              │  A. Channel Configuration
                              │  B. Channel Monitor Configuration
                              │  C. Channel Paging Configuration
                                 D. Paging Format Configuration
                                 E. Edit Custom Calls
                                 F. Input / Output Configuration
                                 G. TX Timeout
                                 H. Priority Marker Frequency
                                 I. Priority Marker Duration
                                 J. Priority Marker Interval
                                 K. Priority Marker Amplitude
                                 L. Custom HLGT Duration

                                 Selection [A]
```

Figure 3-3. SYSTEM CONFIGURATION Menu

Pressing the A key or pressing ENTER will display two more windows. These are shown in
Figure 3-4.

The window displayed to the far left of the screen displays the channel's number, name, type,
and standard. In the other window, the channel number and name are entered.

```
═══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ═══════════
 Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help
```

```
 Channel Number:                         ═════════ SYSTEM CONFIGURATION ═════════

 Channel Name:                            Enter Channel Number (1-14) [ ]

 Type of Channel:                         Channel Name [                ]

                                         F. Input / Output Configuration
                                         G. TX Timeout
 Emergency ANI ACK:                      H. Priority Marker Frequency
                                         I. Priority Marker Duration
                                         J. Priority Marker Interval
                                         K. Priority Marker Amplitude
                                         L. Custom HLGT Duration

                                         Selection [A]
```

Figure 3-4. Channel Number and Name Window

Creating a New Channel

To create a new channel, begin by entering a channel number between 1 and 14. For this
tutorial, enter the digit 1 and press ENTER. Please note that channel numbers 13 and 14 are
reserved for use with the optional phone interface card, and need to be programmed as a
Local (E&M) Control type.

Because this is a newly created system and no channels have been defined, the "Channel is undefined" window will be displayed (see Figure 3-5). Press ENTER to accept the default answer of "Yes" to create a new channel. Next the program will place the cursor in the Channel Name field. Enter a channel name and press ENTER.

```
══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════
 Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help

┌──────────────────────────┐      ┌═══════════ SYSTEM CONFIGURATION ══════════┐
│ Channel Number:          │      │  ┌────────────────────────────────────┐   │
│                          │      │  │ Enter Channel Number (1-14) [ ]    │   │
│ Channel Name:            │      │  └───┬──────────────────────────────┬─┘   │
│                          │      │      │ Channel is undefiined        │     │
│ Type of Channel:         │      │      │ Create new channel ? [Y] Yes No     │
│                          │      │  F   └──────────────────────────────┘     │
│                          │      │  G. TX Timeout                            │
│                          │      │  H. Priority Marker Frequency             │
│ Emergency ANI ACK:       │      │  I. Priority Marker Duration              │
└──────────────────────────┘      │  J. Priority Marker Interval              │
                                  │  K. Priority Marker Amplitude             │
                                  │  L. Custom HLGT Duration                  │
                                  │                                           │
                                  │  Selection [A]                            │
                                  └───────────────────────────────────────────┘
```

Figure 3-5. "Channel is Undefined" Window

Next the program wants to know the type of channel for channel 1. For this tutorial, assume you wish to create a tone control channel. Pressing the DOWN ARROW key twice moves the menu bar to the Tone Control menu option, as shown in Figure 3-6.

Press ENTER to select tone control for channel 1.

```
══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════
 Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help

┌──────────────────────────┐      ┌═══════════ SYSTEM CONFIGURATION ══════════┐
│ Channel Number: 1        │      │                                  4) [ ]   │
│                          │      │  ┌──────────────────────────────┐         │
│ Channel Name: Channel-One│      │  │ A. DC Control-momentary      │   ]     │
│                          │      │  │ B. DC Control-constant       │         │
│ Type of Channel:         │      │  │ C. Tone Control              │         │
│                          │      │  │ D. Local (E&M) Control       │ tion    │
│                          │      │  │ E. Delete Channel            │         │
│                          │      │  │                              │ y       │
│ Emergency ANI ACK:       │      │  │ Selection [A]                │ l       │
└──────────────────────────┘      │  │                              │ .       │
                                  │  └──────────────────────────────┘ le      │
                                  │                                           │
                                  │  Selection [A]                            │
                                  └───────────────────────────────────────────┘
```
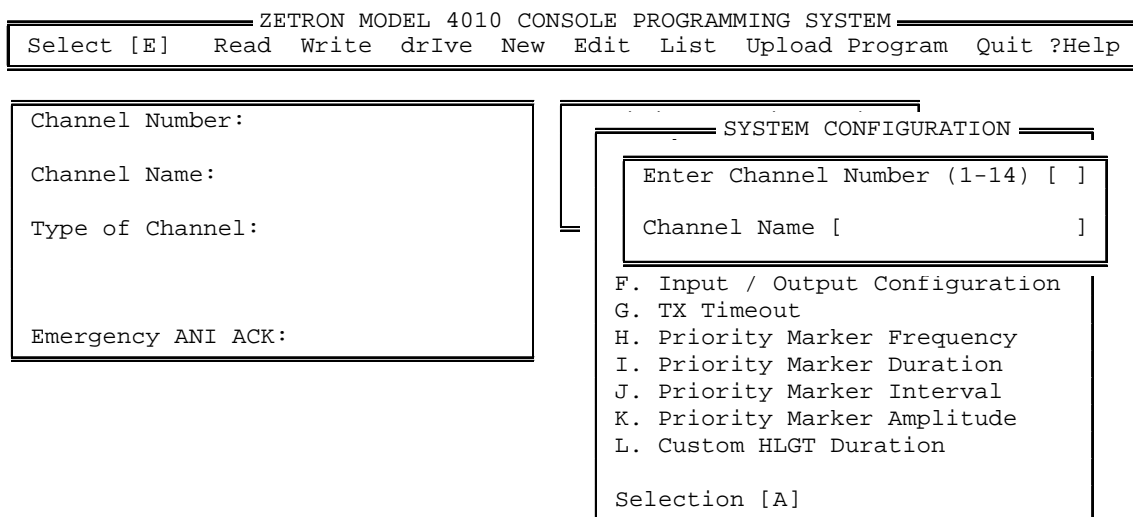
Figure 3-6. Type of Channel Window

Now the program needs to know if the tone control uses a standard or custom protocol. For simplicity, assume you want to use standard tone control.

Press ENTER to accept standard protocol. Next the TONE STANDARDS menu, Figure 3-7, is displayed.

```
╔════════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ════════════════╗
║ Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help ║
╚═══════════════════════════════════════════════════════════════════════════════╝

┌──────────────────────────────┐
│ Channel Number: 1            │        ╔═══════════ SYSTEM CONFIGURATION ═══════╗
│                              │        ║  ┌───────────────────────────4) [ ]   ║
│ Channel Name: Channel-One    │        ║  │ A. DC Control-momentary            ║
│                              │     ┌──╨──┴──────────────────────────┐   ]     ║
│ Type of Channel: Tone Control│     │ A. T1R1 without Paging         │         ║
│                              │     │ B. T1R1 with Paging            │  ²tion  ║
│                              │     │ C. T2R2/T22R without PL        │  ᵗy     ║
│                              │     │ D. T2R2/T22R with PL           │  ¹      ║
│ Emergency ANI ACK:           │     │ E. T4R4 without PL             │  .      ║
└──────────────────────────────┘     │ F. T8R8                        │  ¹e     ║
                                      │                                │         ║
                                      │ Selection [A]                  │         ║
                                      └────────────────────────────────┘         ║
                                      ╚═════════════════════════════════════════╝
```

Figure 3-7. TONE STANDARDS Menu

Examining the TONE STANDARDS Menu, you will notice several abbreviations that you may not be familiar with. T1R1 stands for one transmitter and one receiver base station. A base station designated T2R2 will have a transmitter that can be remotely signaled to transmit on one of two frequencies and a receiver that can be signaled to receive on one of two frequencies. A T4R4 would have four transmit frequencies and four receive frequencies.

Using the DOWN ARROW key move the menu bar so it is positioned over option "D. T2R2/T22R with PL" and press ENTER.

At this time, you will notice that the previous three windows have been removed from the screen and the screen looks like Figure 3-8.

```
╔════════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ════════════════╗
║ Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help ║
╚═══════════════════════════════════════════════════════════════════════════════╝

┌──────────────────────────────┐
│ Channel Number: 1            │        ╔═══════════ SYSTEM CONFIGURATION ═══════╗
│                              │        ║  ┌─────────────────────────────────┐   ║
│ Channel Name: Channel-One    │        ║  │ Enter Channel Number (1-14) [1_]│   ║
│                              │     ┌──╨──┤                                 │   ║
│ Type of Channel: Tone Control│     └─   │ Channel Name [Channel-One     ] │   ║
│                              │          └─────────────────────────────────┘   ║
│ Standard T2R2/T22R with PL   │        F. Input / Output Configuration         ║
│                              │        G. TX Timeout                           ║
│ Emergency ANI ACK: disabled  │        H. Priority Marker Frequency            ║
└──────────────────────────────┘        I. Priority Marker Duration             ║
                                        J. Priority Marker Interval              ║
                                        K. Priority Marker Amplitude             ║
                                        L. Custom HLGT Duration                  ║
                                                                                 ║
                                        Selection [A]                            ║
                                        ╚════════════════════════════════════════╝
```

Figure 3-8. Defined Channel Windows

Using the definition of channel 1 as an example, define channel 2 as a tone channel using standard protocol T2R2/T22R without PL. Define channel 3 as a DC channel using standard protocol T1R1 STD. After you have defined channels 2 and 3, the cursor should be resting in the channel number field.

At this time, press the DOWN ARROW key and you will notice the channel that is displayed in the left-hand window will change. Using the UP and DOWN ARROW keys in the channel number field will allow you to scroll through the channels that are currently defined. The UP and DOWN ARROW keys can be used any time the program requests a channel number.

Defining Console Keys

In this tutorial you have just finished defining channels. Press the ESC key twice to pop back to the EDIT menu. If you are at some other menu in the system, press the ESC key until you return to the MAIN menu and then press the E key.

Press the P key or position the menu bar to "Position Configuration" and press ENTER. The menu shown in Figure 3-9 will be displayed.
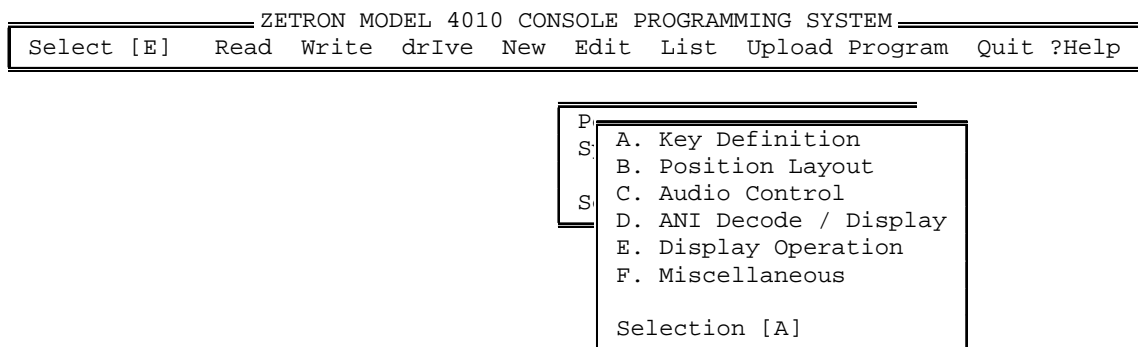
```
=============== ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ===============
 Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help

                                    ┌─────────────────────────────────┐
                                  P │                                 │
                                  S │  A. Key Definition              │
                                    │  B. Position Layout             │
                                  S │  C. Audio Control               │
                                    │  D. ANI Decode / Display        │
                                    │  E. Display Operation           │
                                    │  F. Miscellaneous               │
                                    │                                 │
                                    │  Selection [A]                  │
                                    └─────────────────────────────────┘
```

Figure 3-9. Position Configuration Window

Press the A key or position the menu bar over "Key Definition" and press ENTER.

The next menu displayed will allow you to select which Model 4010 panel you wish to define keys for, as shown in Figure 3-10.

```
=============== ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ===============
 Select [E]     Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help

                                    ┌─────────────────────────────┐
                                  P │                             │
                                  S │  Upper Panel                │
                                    │  Lower Panel                │
                                  S │  Spare Inputs          ay   │
                                    │                             │
                                    │  Select Panel [U]           │
                                    │                             │
                                    │  Selection [A]              │
                                    └─────────────────────────────┘
```
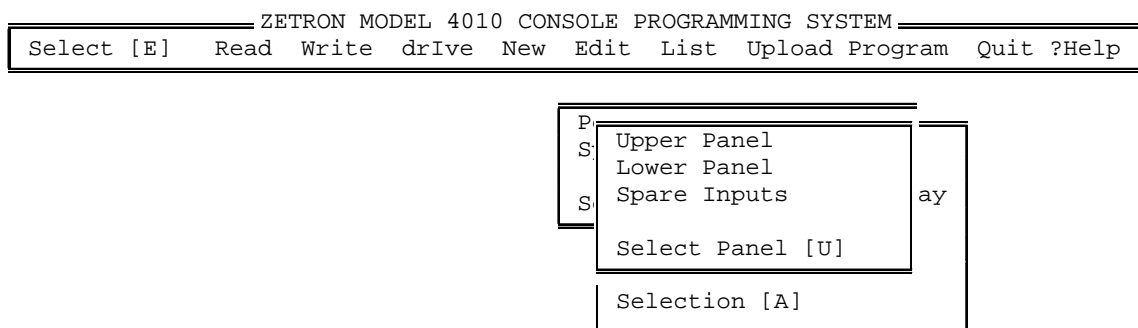
Figure 3-10. Panel Selection Window

Section 3. Tutorial

Press ENTER to select the upper panel and three new windows will be displayed on the screen.

The first window is a representation of the Model 4010 channel control panel. Notice that the key in the upper left hand corner of the panel is highlighted and pressing the arrow keys will move the highlighted key around the panel. As the key is moved around the panel, the Key Number field in the Key Definition window will change. If a key had been defined, the definition of the key would appear in the Key Definition window. The third window reminds you to use the cursor keys to move the highlighted key around the console. The display should now look like Figure 3-11.

```
┌─────────────── ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ───────────┐
│  Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help │
└──────────────────────────────────────────────────────────────────────────┘

┌────────── KEY DEFINITION ──────────┐   ┌─P┌──────────────────────┐──────┐
│                                     │   │ S│ Upper Panel          │      │
│  Key Number   0                     │   │ S│ Lower Panel          │      │
│  Undefined                          │   │  └──────────────────────┘      │
│                                     │   │ S┌────────────────────────────┐ │
│                                     │   │  │ Use cursor keys to select key │
└─────────────────────────────────────┘   │  └────────────────────────────┘ │

┌──────────────────────────────────────────────────────────────────────────┐
│  ZETRON                                         MODEL 4010 UPPER PANEL      │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
│                                                                            │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
│                                                                            │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
│                                                                            │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
│                                                                            │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
│                                                                            │
│  [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ] [   ]          │
└──────────────────────────────────────────────────────────────────────────┘
```

Figure 3-11. Key Definition Windows

For this tutorial, let's say you wish to program the far left column of keys for use by channel 1. Starting at the top of the panel and moving towards the bottom, the following keys are to be programmed: Select, Frequency Select F1, Frequency Select F2, Volume Adjust, Volume Mute and Instant Transmit.

Note: A Select key must be programmed for every channel defined and The Phone channels 13 & 14 must have an On-Hook/Off-Hook or Answer/Hold and Release Key.

With the highlighted key positioned in the upper left hand corner of the panel, press ENTER to select that key for editing.

Next the KEY EDITING menu, Figure 3-12, appears along the top of the panel.

```
┌─────────────────────────────────────────┐
│ [D]  Define  Erase  Move  Copy  Spare    │
└─────────────────────────────────────────┘
```

Figure 3-12. KEY EDITING Menu

Notice that by pressing the LEFT or RIGHT ARROW keys, the highlighted menu option can be changed.

Position the menu bar over the "Define" option and press ENTER.

The KEY FUNCTIONS menu, Figure 3-13, will be displayed.

```
┌─────────────────────────────────────┐
│  A. Channel Functions                │
│  B. System Functions                 │
│  C. Extended Channel Functions       │
│  D. Auxiliary Input / Output         │
│  E. Custom Channel Functions         │
│                                      │
│        Selection [A]                 │
└─────────────────────────────────────┘
```

Figure 3-13. KEY FUNCTIONS Menu

Since the first key to be programmed is a select key and a channel select key is a channel function, choose the CHANNEL FUNCTIONS menu option by pressing the A key or by positioning the menu bar to "Channel Functions" and pressing ENTER.

The KEY FUNCTIONS menu is overlaid with the channel selection windows, Figure 3-14.

```
┌────────────────────────┐  ┌──────────────────────────────────┐
│ Channel Number:        │  │ P┌──────────────────────────────┐│
│                        │  │ S│═══ CHANNEL FUNCTIONS ═══      ││
│ Channel Name:          │  │  │                              ││
│                        │  │ S│ Enter Channel Number from 1 to 14 ││
│ Type of Channel:       │  │  │                              ││
│                        │  │  │ Channel Number [ ]           ││
│                        │  │  └──────────────────────────────┘│
│ Emergency ANI ACK:     │  │ Selection [A]                    │
└────────────────────────┘  └──────────────────────────────────┘
```

Figure 3-14. Channel Selection Windows

Press the DOWN ARROW key once, and channel 1 will be displayed. Press the DOWN ARROW key again and channel 2 will be displayed and so on. Continue pressing the DOWN ARROW key until channel 1 is displayed again.

With channel 1 displayed, press ENTER and the CHANNEL FUNCTIONS menu, Figure 3-15, will be displayed.

```
 ┌──────────────────────────────────┐  ┌─────────── CHANNEL FUNCTIONS ═══════┐
 │ Channel Number: 1                │ P├                                     │
 │                                  │ S│  A. Select                          │
 │ Channel Name:    Channel One     │  │  B. Frequency Select                │
 │                                  │ S│  C. Frequency Select with Voting    │
 │ Type of Channel: Tone Control    │  │  D. Instant Select                  │
 │                                  │  │  E. Instant Select with Voting      │
 │ Standard T2R2/T22R with PL       │  │  F. Instant Transmit                │
 │                                  │  ]  G. Volume Keys                     │
 │ Emergency ANI ACK: disabled      │  │  H. Patch                           │
 └──────────────────────────────────┘  │  I. Main / Standby                  │
  [   ]  [   ]  [   ]  [   ]  [   ]  ]  │  J. ANI Source                      │
                                       │  K. Site Intercom                   │
  [   ]  [   ]  [   ]  [   ]  [   ]  [  ]  L. Monitor                         │
                                       │  M. Phone ON/OFF Hook               │
  [   ]  [   ]  [   ]  [   ]  [   ]  [  ]  N. Phone Hook Flash                │
                                       │                                     │
  [   ]  [   ]  [   ]  [   ]  [   ]  [  ]     Selection [A]                   │
                                       │                                     │
  [   ]  [   ]  [   ]  [   ]  [   ]  [  └─────────────────────────────────────┘
```

Figure 3-15. CHANNEL FUNCTIONS Menu

Since you wish to define a select key, press the A key.

Several windows will now be removed from the screen. The screen now looks like Figure 3-11 with two exceptions. First, an "X" is displayed on the key that was just defined. When an "X" is displayed on a key, it indicates that the key has been defined. Second, the key definition is now displayed in the Key Definition window.

A frequency select F1 key is the second key to be defined. Using the ARROW keys, position the highlighted key to the key directly under the select key you just defined.

Next press ENTER and the KEY EDITING menu will be displayed.

Press ENTER again to select the define function.

A frequency select key is also a channel function, so select the CHANNEL FUNCTIONS menu option. Now the channel selection windows appear.

Enter the digit 1 in the channel number field and press ENTER.

Move menu bar to the "B. Frequency Select" menu option and press ENTER.

Next the FREQUENCY SELECTION menu is displayed. To demonstrate the Move key function, select frequency F2 rather than F1 and press ENTER.

The command to select the frequency that channel will use can be sent when this key is pressed or when the channel is transmitted upon, or both. The SEND FUNCTION menu now displayed allows you to select when the command is sent.

Select option A, B, or C and press ENTER.

Several windows will now be removed from the screen and you can now select another key to define. Program the key directly under the frequency select F2 key to be a frequency select F1 key for channel 1.

Moving Console Keys

Using the move key function, you can now correct the transposition of the frequency select keys.

Move the highlighted key to the position occupied by the frequency select F2 key and press ENTER.

Select the Move function and press ENTER.

Notice the "X" on the key has changed to an "M"; this reminds you that this is the key being moved.

Move the highlighted key to the position occupied by the frequency select F1 key and press ENTER.

Because the position you wanted to move the key to is already defined, a menu pops up and asks if you wish to delete the key or exchange the key. In this case you want to exchange the keys, so move the menu bar to the "Exchange Key" option and press ENTER.

Now the frequency select keys are in their correct locations.

The next keys to be defined are Volume Adjust and Volume Mute. They are programmed in much the same manner as the previous keys you have defined.

For the Volume Adjust, position the highlighted key to the key directly under frequency select F2 key and press ENTER.

Select Channel Functions from the KEY FUNCTIONS menu.

Select channel 1, then select "G. Volume Keys" from the CHANNEL FUNCTIONS menu, and then select "A. Volume Adjust".

The Volume Mute key goes directly under the Volume Adjust key. Follow the steps used to define the Volume Adjust key except for the last step: select option "E. Volume Mute" from the VOLUME KEY menu.

The last key left to define is the Instant Transmit key. This key is a channel function. Using the process that you used to define the other channel functions, define the Instant Transmit key for use on channel 1.

Copying Console Keys

For this tutorial, suppose that you want the keys that control channel 2 to be programmed just like the keys for channel 1. You can go back through the steps you used to program the keys

for channel 1 and substitute channel 2 for channel 1 or you can use the copy function. The copy function makes it easy to replicate groups of keys on the console.

Start by moving the highlighted key to the upper left hand corner of the panel. Next press ENTER and then select the Copy function. Notice that the "X" marking the highlighted key has changed to a "C" for copy.

Using the DOWN ARROW key, move the highlighted key down the column. As you move the highlighted key, the keys marked with an "X" will change to a "C". When you reach the bottom of the column, press ENTER to signal the program that you are finished selecting keys to copy.

Now all the keys marked "C" begin to wink, and the highlighted key has moved back to the first key you marked in the copy group.

Using the RIGHT ARROW key, move the copy group over to the second column of keys on the panel, and then press ENTER.

At this point the program scans the keys in the copy group to check if any channel keys are defined within the group. In this tutorial, several of the keys are channel keys so the program pops up a window asking if it should change the channel numbers to another channel. If you answer Yes to this prompt, a channel selection window will be displayed on the screen.

Enter the digit 2 for channel 2 and press ENTER.

All of the keys in the copy group that were channel keys will be changed to operate on channel 2. Next, the program will display a window asking if you wish to copy again, respond with a No.

With a few quick key strokes, you have defined the keys that control channel 2. The copy function makes it very easy to make a template of keys to control one channel and then replicate it across the panel for other channels.

Listing Key Definitions to Printer
After you have defined the keys for the first two channels in your system, a hard-copy listing may be useful to check your work. If the console representation is still on the screen, press ESC until you return to the MAIN menu.

From the MAIN menu, move the menu bar to the "List" option and press ENTER or enter L.

At this time, turn on the printer and make sure that paper is loaded and the printer is on-line.

Looking at Figure 3-16, notice that you can print the key configuration or the system configuration. Since you have just defined the upper panel key configuration, enter a K or just press ENTER.

```
                        ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM
   Select [L]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
                                   Key Configuration
                                   System configuration

                                   Selection [K]
```
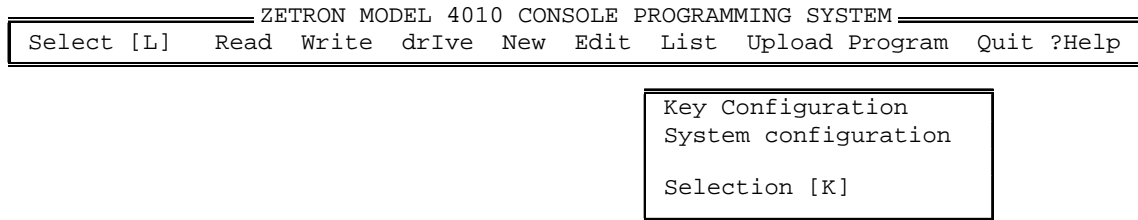
Figure 3-16. LIST Menu

The report will begin printing on the printer. At any time during the printing of the report, pressing the ESC key will cancel the printing of the report.

If you want to have a listing of the channel configuration, press the ESC key to return to the LIST menu. Move the menu bar to the "System Configuration" option and press ENTER. The system configuration will begin printing. Remember that pressing the ESC key will cancel the report.

To return to the MAIN menu, press the ESC key.

QUITTING CPS

Press Q from the MAIN menu to quit CPS.

As a precaution, the program checks if you have made any modifications. If you have modified the system, the QUIT menu will be displayed, see Figure 3-17.

```
                        ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM
   Select [Q]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
                   Changes have been made to the configuration
                   Do you wish to save the changes before exiting
                                  [Y]    Yes   No
```
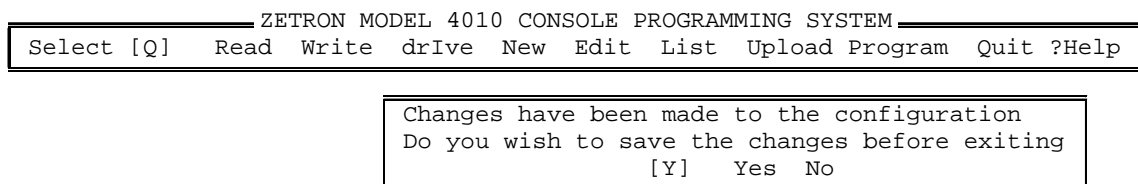
Figure 3-17. QUIT Menu

To save the configuration to the disk before exiting, press the Y key.

The program will now search the disk for any other configuration files and display two windows, see Figure 3-18. < NAME > represents the system name that you previously entered.

```
=================== ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ===========
 Select [Q]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
< NAME >          Select file name to save configuration file
                  to.   Default name is listed first.
```

Figure 3-18. Save Configuration File Windows

Notice the current system name is the first file listed. Press ENTER to accept the default file name. If you don't want to accept the default name, just type over the displayed name and press ENTER.

After you have accepted a new file name, the CREATE FILE menu, Figure 3-19, is displayed.

```
=================== ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ===========
 Select [Q]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
< NAME >          Select file name to save configuration file
                  to.   Default name is listed first.

                  This file does not exist.   Create new
                  configuration file?  [Y]   Yes   No
```

Figure 3-19. CREATE FILE Menu

Press the Y key or press ENTER to create a new file and save the new configuration to it. If you made a mistake typing the file name and do not wish to create a new configuration file using that name, press N or ESC to return to the save configuration file windows.

After pressing Y, the configuration file is saved to the disk, and the program exits.

TUTORIAL CONCLUSION

This tutorial described how to create a new channel, define, move and copy console keys, and print reports. For a complete description of CPS functions, see Section 4. The complete CPS menu structure is presented in Appendix D.

4. PROGRAM OPERATION

4. PROGRAM OPERATION

INTRODUCTION

This section is organized to provide more detailed information on program operation. Reading this section is most useful after you are familiar with CPS. This section covers the nine main activities of program operation:

1. Reading a system configuration file from disk to the edit buffer

2. Updating system configuration files by writing the current edit buffer to disk

3. Selecting a drive and directory path

4. Creating a new system configuration file

5. Editing (modifying) the current configuration file

6. Printing key and system configurations by listing them to a printer

7. Uploading a Model 4010 configuration to a PC

8. Programming a Model 4010 by downloading the current configuration file to the Model 4010

9. Quitting CPS and returning to DOS

READING A SYSTEM CONFIGURATION FILE

Normally the first operation performed after starting CPS is reading a system configuration file from the disk to the edit buffer. A system configuration contains all of the key definitions for the two programmable Model 4010 panels and all channels. After editing the configuration, it is written back to the disk using the Write function.

To read a configuration file, press R from the MAIN menu, shown in Figure 4-1.

```
════════════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ════════════════════
  Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

Figure 4-1. MAIN Menu

Selecting a File to Read

Pressing R from the MAIN menu displays the Read File Select window. The program fills the window with a list of configuration files that were found in the current drive and directory. The current drive and directory can be changed using the Drive function. Using the UP and DOWN ARROW keys, position the cursor on the file you wish to read. After positioning the cursor, press ENTER. The file will be read into the program, and the windows will be removed from the screen.

WRITING A SYSTEM CONFIGURATION FILE

The Write function updates the configuration file stored on the disk by writing the current edit buffer to disk. The Write function can be activated in three ways. First, by pressing W from the MAIN menu. Second, by using the New function after modifications have been made to the current configuration. Third, by quitting CPS after modifications have been made. The New and Quit functions notify you that modifications have been made and ask if the configuration should be saved before performing their respective functions.

Selecting a File to Write

Pressing W from the MAIN menu displays the Write File Select window. The first file name in the window is the default or current system name. The remaining file names are listed from the current drive and directory. The current drive and directory can be changed using the Drive function. Normally you will just press ENTER to select the default file name. Positioning the cursor with UP and DOWN ARROW keys, you can select a different file name other than the default. If you wish to create a new file name, type over one of the existing file names and press ENTER.

Overwriting or Creating a New File

After you have selected a file name, the program will check if the file exists on the current drive and directory. If the file exists, the program will display a menu asking if you want the file overwritten. Answering Y overwrites the file. Pressing N or ESC returns you to the Write File Select window. If the file does not exist, the program displays a menu asking if it should create a new configuration file. Answering Y will create a new configuration file. Pressing N or ESC returns you to the Write File Select window.

SELECTING A DRIVE AND DIRECTORY

The Drive function allows the user to select the disk drive and directory used for reading and writing configuration files. The first time CPS is executed, the default drive and directory is set to the current drive and directory from which CPS is being run.

Setting Current Drive and Directory

Pressing I from the MAIN menu displays the Set Drive window. The current drive and directory is displayed for editing. To change drives, enter a drive letter followed by ":" (colon). If no drive is specified, the current (default) drive is used. If the directory needs to be a directory other than the root or top directory for a drive, enter a "\" (backslash) followed by the directory name. For example, if your disk on drive C were set up as shown in Figure 4-2 and you wanted to read configuration files for Seattle Police Department, the drive and directory would be C:\SEATTLE\POLICE. Likewise, the drive and directory for Bellevue Fire Department would be C:\BELLEVUE\FIRE.
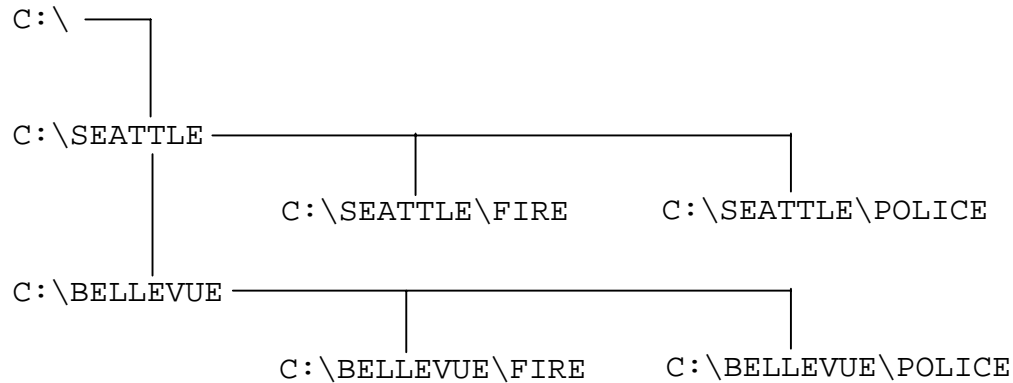
```
C:\ ──────┐
          │
          │
C:\SEATTLE ──────────────┬───────────────────────┐
                         │                        │
                         │                        │
              C:\SEATTLE\FIRE          C:\SEATTLE\POLICE
          │
C:\BELLEVUE ─────────────┬───────────────────────┐
                         │                        │
                         │                        │
              C:\BELLEVUE\FIRE         C:\BELLEVUE\POLICE
```

Figure 4-2. Drive and Directory Example

To select the current drive and directory (from which CPS was started), enter just a "."
(period). If you do not understand drive letters and directories, refer to your DOS manual.

CREATING A NEW SYSTEM CONFIGURATION

The New function allows the user to change the current system name. It is normally used
when you are creating a system. For example, if you read a configuration file, then listed the
key configuration, and now you want to create a new system, you would use the New
function. If modifications have been made to a configuration that you are currently working
on, the program will check if you wish to save the current configuration before changing to a
new system.

Changing the Current System Name
Pressing N from the MAIN menu displays the New System Name window. If modifications
have been made to the current configuration, the program will ask if you wish to save the
changes before changing the system name. Answering Y allows you to save the current
configuration. Answering N or pressing ESC skips the save function and allows you to enter
a new system name. After entering a system name, press ENTER.

EDITING THE CURRENT SYSTEM CONFIGURATION FILE

Most CPS work is done with the Edit function. The Edit function is divided into two main
areas. The first area deals with programming the Model 4010 panels. The second area deals
with system configuration.

Position Configuration
Pressing E from the MAIN menu displays the EDIT SELECT menu. To edit the Model 4010
panels or modify some miscellaneous system functions, press P to display the menu shown in
Figure 4-3.

```
══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════
  Select [E]   Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help
```
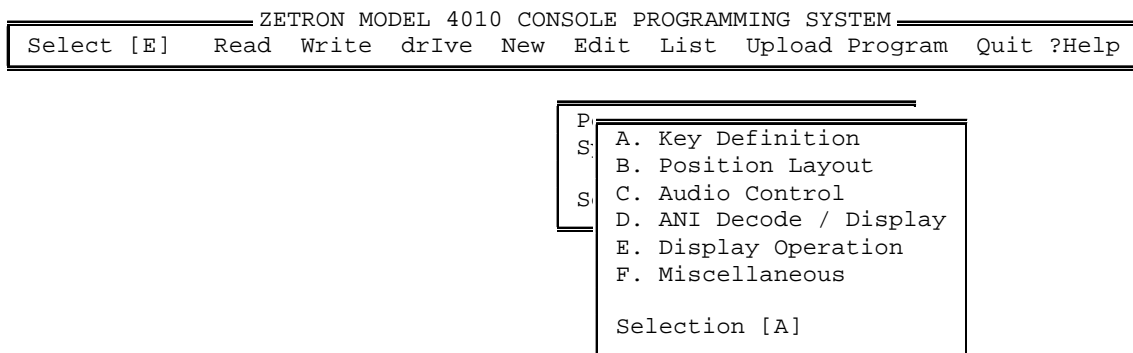
```
                              ┌P┌─────────────────────────────┐
                              │S│ A. Key Definition           │
                              │ │ B. Position Layout          │
                              │S│ C. Audio Control            │
                              └─│ D. ANI Decode / Display      │
                                │ E. Display Operation         │
                                │ F. Miscellaneous             │
                                │                              │
                                │ Selection [A]                │
                                └──────────────────────────────┘
```

Figure 4-3. PANEL EDIT Menu

A. Key Definition

Press A from the PANEL EDIT MENU to edit key definitions. The program then displays the
PANEL SELECTION menu, shown in Figure 4-4. Selecting a panel from this menu displays
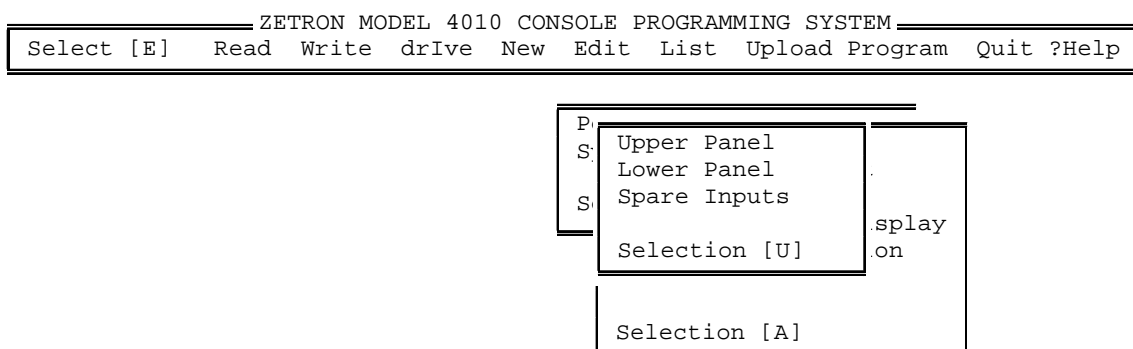those keys that are actually programmed.

```
══════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════
  Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
                        ┌P┌──────────────────┐──────┐
                        │S│ Upper  Panel      │      │
                        │ │ Lower  Panel      │  .   │
                        │S│ Spare  Inputs     │      │
                        └─│                   │.splay│
                          │ Selection [U]     │.on   │
                          └───────────────────┘      │
                          │                          │
                          │ Selection [A]            │
                          └──────────────────────────┘
```

Figure 4-4. PANEL SELECTION Menu

To edit the key definitions for a panel, press U to select the upper panel or L to select the
lower panel, or position the menu bar and press ENTER. Now the program will display one
of the two panel configurations.

If spare inputs have been enabled, this menu will also include a Spare Inputs selection. Spare
inputs are conceptually the same as pressing a key on a panel. The Model 4010 has eight
spare inputs. The inputs are located on pins 1 through 8 on connector P8. To activate an
input, short a spare input pin to ground through a contact closure. A handy ground is located
on pin 10 of P8. A spare input is defined in the same manner as a panel key.

To select a key to modify, use the UP, DOWN, LEFT or RIGHT arrow key to position the
highlighted key to the key you wish to modify. After moving to the desired key, press
ENTER to select the highlighted key for modification.

Next, the KEY MODIFICATION menu is displayed, as shown in Figure 4-5. From this menu, you may define, erase, move, or copy a key or you may assign an existing key to a spare input (if enabled).

```
[D]  Define Erase  Move  Copy  Spare
```

Figure 4-5. KEY MODIFICATION Menu

Pressing D displays the KEY TYPE menu, as shown in Figure 4-6. The keys are grouped into five categories, shown in Table 4-1. Using the arrow keys to position the menu bar, select the key category that contains the key you wish to modify.

```
A. Channel Functions
B. System Functions
C. Extended Channel Functions
D. Auxiliary Input / Output
E. Custom Channel Functions

      Selection [A]
```

Figure 4-6. KEY TYPE Menu

The five key categories are explained as follows:

1. Channel Functions
    A Channel Function key allows the operator to select, change frequency, instant transmit, patch, adjust volume level, and mute on each channel defined in the system.

    The first step in defining a Channel Function key is selecting the channel to use. After the program displays the channel selection window, enter a channel number from 1 to 14 or use the UP and DOWN arrow keys to move through the channels. After selecting a channel, press ENTER. At this point the CHANNEL FUNCTIONS menu is displayed. Use the menu bar or enter a letter from A through N to select the function you wish to define.

    If the channel selected uses custom protocol and the function selected was Select, Frequency Select, or Instant Select, the program will display a RECEIVE FUNCTION menu. If the channel uses DC control, then the menu will display DC currents; otherwise, it will display tone frequencies. Select a custom function and press ENTER.

    Next, the program will display a TRANSMIT FUNCTION menu. Select a custom function and press ENTER.

    After selecting a function, the Channel Functions windows will be removed from the screen on all functions except Frequency Select and Instant Select functions if the channel was defined as T2R2, T4R4, or T8R8. These Frequency / Instant Select functions display a frequency selection window. After selecting a frequency for a

Frequency Select Key, the program will display the send function window. If "Upon Transmit Only" is selected, the function will be sent whenever the channel is transmitted on. Selecting "Instantly" will cause the function to be sent when the key is pressed. Selecting "Instantly and upon TX" will cause the function to be sent immediately and when the channel is transmitted on. Select when you want the function sent to the channel and press ENTER.

When defining an Instant Select with Voting key, the program needs to know which auxiliary input port to check for the voting input. When input X is closed, the corresponding CALL lamp will flash on the Instant Select with Voting key. After selecting a frequency, the program will display the Voting Aux Input window. Enter a previously defined auxiliary input number, and press ENTER.

Table 4-1. Key Categories — General

Channel Functions	**System Functions**
Select	Transmit Keys
Frequency Select	Monitor
Frequency Select with Voting	Site Intercom
Instant Select	Alert
Instant Select with Voting	Mute Keys
Instant Transmit	Simultaneous Select
Volume Adjust (knob)	Group Keys
Mute / Adjust (knob)	Patch Keys
Volume Up (key)	Priority Marker
Volume Down (key)	Speaker / Headset
Volume Mute	Diagnostics Reset
Patch	Clock Set
Main / Standby	ANI Keys
ANI Source	Channel Test
Site Intercom	Phone Keys
Monitor	Paging Keys
Phone On/Off Hook	
Phone Hook Flash	

Extended Channel Functions	**Auxiliary Input / Output**
CTCSS Select	Auxiliary Input
Repeat On / Off	Auxiliary Output Interlocked
Coded / Clear	Auxiliary Output Toggle
Second Receiver Unmute / Mute	Auxiliary Output Momentary
Wild Card I On / Off	Spare Output Latching
Wild Card II On / Off	Spare Output Toggle
	Spare Output Momentary

Table 4-2. Key Categories — Custom Channel Functions

Custom Tone Functions	Custom DC Functions	Motorola/GE Control Currents*
No Tone	No Current	No Current
650 Hz	+ 2.5 mA	+ 2.5 mA
750 Hz	+ 5.0 mA	+ 5.5 mA
850 Hz	+ 7.5 mA	+ 6.0 mA
950 Hz	+10.0 mA	+11.0 mA
1050 Hz	+12.5 mA	+12.5 mA
1150 Hz	+15.0 mA	+15.0 mA
1250 Hz	+15.5 mA	+15.5 mA
1350 Hz	0.0 mA	0.0 mA
1450 Hz	- 2.5 mA	- 2.5 mA
1550 Hz	- 5.0 mA	- 5.5 mA
1650 Hz	- 7.5 mA	- 6.0 mA
1750 Hz	-10.0 mA	-11.0 mA
1850 Hz	-12.5 mA	-12.5 mA
1950 Hz	-15.0 mA	-15.0 mA
2050 Hz	-15.5 mA	-15.5 mA

* (See Appendix C)

2. System Functions
   System function keys allow the operator to perform system level functions, such as transmit, monitor, generate alert tones, all mute, simultaneous select, group select, priority marker, and paging.

   Selecting System Functions displays the SYSTEM FUNCTIONS menu with the selections shown in Table 4-1. Selecting Alert, Priority Marker, or any function that ends with the word "keys" displays a submenu requesting more information. Selecting any other function completes the key definition and removes the System Functions windows. All the system functions are described in Appendix D.

3. Extended Channel Functions
   The first step in defining an Extended Channel Function key is selecting the channel to use. After the program displays the channel selection windows, enter a channel number from 1 to 14 or use the UP and DOWN arrow keys to move through the channels. After selecting a channel press ENTER. At this point the EXTENDED CHANNEL FUNCTIONS menu is displayed. Use the menu bar or enter a letter from A through F to select the function you wish to define.

   After selecting a function, the Extended Channel Functions window will be removed from the screen on all functions except CTCSS Select. The CTCSS Select function displays a private line selection window. Select a private line and press ENTER.

4. Auxiliary Input / Output
   Auxiliary Input / Output ports have a variety of uses. Input ports can monitor alarms or show voter status. Output ports can control gates, gas pumps, video monitors, room

lights and doors, even control the lawn sprinkler system.

Auxiliary Input Port numbers 9-38 are assigned to the optional Expanded Aux. I/O Card(s) (Part No. 702-9448) as follows: 9-14 to the first Aux. I/O Card, 15-20 to the second Aux. I/O Card, etc. This allows the Model 4010 to support up to five Aux. I/O Cards (30 ports).

Auxiliary Input Port numbers 1-8 are assigned to the Model 4010 main PC board Spare/Aux. inputs (on connector P8) if these inputs have been configured as auxiliary inputs. If the inputs have been defined as spare inputs instead (the default), Auxiliary Input Port numbers 1-8 are unavailable and cannot be selected in this menu.

Auxiliary Output Port numbers 9-38 are assigned to the optional Expanded Aux. I/O Card(s) in the same manner as the input ports as described above. Auxiliary Output Port numbers 1-8 are assigned to the Model 4010 main PC board Spare/Aux. outputs (on connector P7) if these outputs have been configured as auxiliary outputs. If the outputs have been defined as spare outputs instead (the default), Auxiliary Output Port numbers 1-8 are unavailable and cannot be selected in this menu. In this case, however, three additional menu items will appear in the AUXILIARY INPUT/OUTPUT menu to allow the spare outputs to be defined.

Note: *Auxiliary Output Ports 1 through 4 are logic level outputs. Auxiliary Output Ports 5 through 8 are relay closures. See Model 4010 Radio Dispatch Console Service Manual (Part No. 025-9228) for pin-outs.*

Selecting Auxiliary Input / Output Functions will display the AUXILIARY INPUT / OUTPUT menu. From the menu you may assign an auxiliary input, one of three different types of auxiliary outputs, or spare outputs.

Selecting Auxiliary Input displays the INPUT PORT selection menu. Select a previously defined input port by entering a number from 1 to 38 or using the UP and DOWN arrow keys to move through the defined input ports. After selecting an input port, press ENTER. The next menu displayed allows you to select what type of input this key will be and how the lamps will function on the key. If you select "C. Dual Input", the program displays a second INPUT PORT selection menu. Select the second input port in the same manner as the first input port.

Selecting any of the three Auxiliary Output menu options displays the OUTPUT PORT menu. Select a previously defined output by entering a number from 1 to 38 or using the UP and DOWN arrow keys to move through the output ports. After selecting an output port, press ENTER. The next menu displayed allows you to select what type of output this key will indicate and how the lamps will function on the key. Selecting output-only functions A and B completes the definition of the output key. Selecting options C through G displays additional input port selection windows. Select the additional input ports by entering a number from 1 to 38 or using the UP and DOWN arrow keys to move through the input ports. After selecting an input port, press ENTER.

If present, selecting one of the three Spare Output menu options displays the SPARE OUTPUT menu. Select a previously defined output port by entering a number from 1 to 8 and pressing ENTER. One of the main uses of the Spare Outputs is controlling telephone equipment connected to the console.

Note: *If Spare Outputs 7 and 8 are not programmed, they will function as follows:*

        Spare Output 7:   *ON when ANI is displayed on the console display, OFF otherwise.*

        Spare Output 8:   *Produces a 500 ms pulse when an ANI is decoded by the console.*

5. Custom Channel Functions

    Custom Function keys allow you to select custom DC currents or Tone frequencies to be sent when the key is pressed or when the channel is transmitted on. Only channels defined to use custom protocol may be defined using this menu. After selecting Custom Functions, a channel selection window will be displayed. Select a channel using the UP and DOWN arrow keys or entering a number from 1 to 14 and pressing ENTER.

    If the channel selected is a DC controlled channel, a menu displaying DC currents will be displayed; otherwise the menu will display tone frequencies. Select the Receive Function, i.e., the function that will be sent when the key is pressed. If a Receive Function is not required, select either "No Tone" for tone controlled channels or "No Current" for DC controlled channels, and press ENTER. Next, the Transmit Function menu is displayed. Select the function that will be sent when the channel is transmitted on and press ENTER. The next menu displayed will prompt for Single or Toggle function key. If the key is to perform a single function, select Single, and press ENTER. If the key is to toggle between two states, select Toggle, and press ENTER. For the toggle function, select another set of receive and transmit functions from the menus presented.

    If another custom key that is already defined uses the same channel as the key that is being defined, a menu will be displayed. The menu will prompt if you want this custom key to interlock with another key. Interlocking means that within a group of interlocking keys only one indicator lamp will be lit at a time. The indicator lamp that is lit will be the last key that was pressed within that group of keys. Up to five groups of custom keys may be interlocked at one time within a channel.

    If you wish to interlock the custom key that you are defining with another key, answer Yes to the INTERLOCK menu. Another window is then displayed; it prompts you for a Key Number to interlock with. If you don't know the Key Number, enter a "?" in the Key Number field and a window will be displayed containing a diagram of that panel with the key numbers displayed in each key position.

Section 4. Program Operation

B. Position Layout

This selection allows expansion panels to be incorporated into the Model 4010 configuration. Figure 4-7 is displayed if this selection is pressed. Panel #2 or #3 are the only options that are available. Once either 2 or 3 is entered Figure 4-x2 is diplayed. Panel 2 must be entered before Panel 3, or an error message is displayed. Figure 4-x2 allows the operator to select A, B, or C, to indicate a 4115, a 4015, or a 4011 console expander. After a selection is made, the CPS display (Figure 4-7) is updated to indicate which expansion panel has been added to the configuration.

Once an expansion panel has been added, the "A. Key Definition" selection shown on page 4-4 will indicate this new configuration and allow expansion panel data to be added.

```
Panel #0 Main Upper
Panel #1 Main Lower
Panel #2 Undefined
Panel #3 Undefined

Select Panel 2 or 3 [2]
```

Figure 4-7. Position Layout

```
D. Model 4115 Console Expander
E. Model 4015 Console Expander
F. Model 4011 Console Expander

Select Model [A]
```

Figure 4-8. Position Layout Sub-Panel

C. Audio Controls

This function sets various volume levels and speaker muting options for the system. Select E from the MAIN menu, and then select P to display the next menu. Select C and the AUDIO CONTROLS menu will be displayed.

The following list describes the seven selections on the AUDIO CONTROLS menu.

1. Muted Audio Level
   Select option A from the AUDIO CONTROLS menu. Enter a number from 0 to 99 representing the percentage of total volume to be used as a muted audio level for all channels of the system. The percentage entered will be rounded up to the nearest integer multiple of 12.5.

2. Minimum Audio Level
   Select option B from the AUDIO CONTROLS menu. Enter a number from 0 to 99 representing the percentage of total volume to be used as a minimum adjustable audio

level for all channels of the system. The percentage entered will be rounded up to the nearest integer multiple of 12.5.

3. Default Volume Level
    Select option **C** from the AUDIO CONTROLS menu. Enter a number from 0 to 99 representing the percentage of total volume to be used as a "power up", or default, volume level for all channels of the system. The percentage entered will be rounded up to the nearest integer multiple of 12.5.

4. Speaker Mute while Transmitting
    Select option **D** from the AUDIO CONTROLS menu. Answer **Y** to the next menu if you want both select and unselect speakers to mute when you are transmitting. Answer **N** if you want speakers to remain unmuted.

5. Muting Idle Channels
    Muting idle channels causes audio from channels that do not have "call" activity to be muted. This is useful for a system that has many channels, since quiescent line noise will accumulate on the unselected speaker audio.

    Select option **E** from the AUDIO CONTROLS menu. The next menu displayed allows you to select the muting for the unselected channels. If you select options **B** or **C**, the program will prompt if you wish to have the channels unmute when the CTCSS monitor function is active if appropriate for this type of channel.

6. Muting Signaling Tones
    Select option **F** from the AUDIO CONTROLS menu. Answer **Y** to the next menu if you want tones from the Auxiliary Audio Input to be muted from the console speakers. Answer **N** if you want to hear the signaling tones.

7. Mic Delay Eliminator
    When the Mic Delay Eliminator is enabled, the transmitter is held on for approximately 1 second after the PTT or Transmit key is released. This is used with optional modems that have a voice delay feature.

    If modems are not installed, the Mic Delay Eliminator must be disabled. When modems are installed, select **G** from the AUDIO CONTROLS menu and select **Y** to enable Mic Delay Eliminator.

D. ANI Decode / Display

ANI (automatic number identification) is normally used for identification of mobile radios. ANI uses DTMF and other formatted signaling tones that are automatically or manually sent when the radio is keyed. One use for ANI is a one-button press on the radio to call for help.

On systems equipped with the ANI option (Part No. 702-9449), the ANI Decode/Display function will allow the ANI mode and the ANI address to be set for each position.

Section 4. Program Operation

Select E for edit from the MAIN menu and then select P to display the next menu. Next, select D for ANI Decode / Display and the ANI menu will be displayed. The two ANI menu selections are described below:

1. ANI Operating Mode
   To enable or disable ANI decoding, select Operating Mode from the ANI menu. The window shown in Figure 4-9 will open.

   Select option A to disable or enable ANI decoding. Select option B to enable only selected channels. Select option C to configure ANI Channel Unmute operation. Select option D for all channel ANI display. Select option E to configure Emergency ANI Acknowledge.

```
A. No ANI display
B. Selected Channels
C. ANI Channel Unmute Operation
D. All Channels
E. Emergency ANI Acknowledge

ANI Operation [C]
```

Figure 4-9. ANI Operating Mode Window

Selecting option C opens the window shown in Figure 4-10.

```
Unmute upon receiving
ANI?   [Y] Yes No
```

Figure 4-10. ANI Channel Unmute Window

Selecting option D sets the configuration to allow the ANI data to be displayed on every configured channel.

Selecting option E opens the window shown in Figure 4-11.

```
===== EMERGENCY ANI ACK CHANNELS =====

Enter Channel Number from 1 to 14

Channel Number [_]
```

Figure 4-11. Emergency ANI ACK Channels Window

After entering a channel number, the window shown in Figure 4-12 is displayed. Use the keyboard arrow keys to edit your selection.

```
EMERGENCY ANI ACK ENABLED?
      [N] Yes No
```

Figure 4-12. Emergency ANI ACK Enable/Disable Window

After making your selection, press the ESC key to return to the CPS main menu.

2. ANI Destination Address
   To set the position's ANI address, select Destination from the ANI menu.

   The Model 4010 has two ANI addresses: a primary and a secondary. Normally the primary address is used to select a group of consoles, while the secondary address is used to select an individual console within the group. If only a single console is involved, the secondary address is not used. For a group call, the primary addresses should be set the same for all of the consoles in the system.

   Enter the primary address by entering up to six DTMF digits in the primary address field and pressing ENTER. Enter the secondary address in the same manner. The following characters are valid DTMF digits: 0123456789ABCD#*.

   The timeout period is the time window between the detection of a valid address and the last DTMF digit accepted. If the calling unit has automatic ANI calling, 1 or 2 seconds should be sufficient. If the calling unit uses a manual keypad to enter the ANI address, 5 seconds is the normal timeout. Enter a timeout period between 1 and 10 seconds and press ENTER.

Note: During operation, new ANIs will only be recognized after the time period has elapsed after the previous ANI.

E. Display Operation

The Display Operation function sets the mode of operation for the console display. Select E for edit from the MAIN menu and then select P to display the next menu. Next, select E and the DISPLAY OPERATION menu will be displayed. Select the desired mode for the console display and press ENTER.

F. Miscellaneous

The Miscellaneous function allows the following parameters to be set: audio source for "soft" transmit keys, the display mode of instant select keys, the duration of the Call lamp after the received audio stops, and selection of the dynamic mic device.

Select E from the MAIN menu and then select P to display the next menu. Next, select F to display the MISCELLANEOUS SETTINGS menu.

Select option A to set the audio source for "soft" transmit keys and display the AUDIO SOURCE menu.

From the following list, select the mic source that will be used when a "soft" transmit key is pressed and then press ENTER.

    A.   Always use Deskmic or Gooseneck mic when instant Xmit is pressed.

    B.   Always use Handset or Headset mic when instant Xmit is pressed.

    C.   Spare Input #9 LOW use Deskmic or Gooseneck, HI use Handset or Headset when instant Xmit is pressed.

    D.   If Electret PTT and Hookswitch are closed, use Handset. If Hookswitch is open, use Deskmic.

Refer to Table 4-3 for a more thorough explanation of audio steering.

Note: *External transmit switches are not affected.*

Select option B to set the lamp display mode for selected Instant Select and Frequency Select keys. Then from the next menu, choose option A to select a blinking green lamp or B for a solid green lamp.

Select option C to set the duration the Call lamp remains on after the received audio stops. Enter a value from 0 to 60 in the next window. Note that this time duration is in addition to the hardware delay that is always present (approximately 2.3 seconds).

Select option D to set the physical device assigned to the D mic input. Select Gooseneck or Deskmic from the next menu.

Press the ESC key to return to the MAIN EDIT menu.

Table 4-3. Model 4010 Audio Sources and Steering Notes

A.	**There are only four external audio sources:**
	1. "D" Mic - Desktop mic
	2. "E" Mic - Headset or handset
	3. "Aux" In - Auxiliary input
	4. "GN" - Gooseneck mic
B.	**There are four methods of turning on the audio:**
	1. D PTT - Desktop mic
	2. E PTT - Headset or foot switch
	3. A PTT - Auxiliary input
	4. "Soft" Transmit Keys
C.	**There are four software selectable audio steering options:**
	1. Always D Mic
	2. Always E Mic
	3. Input #9 steered (mic switch, connector J1)
	4. Hookswitch (HSW) signal steered (handset cradle)

PTT Input	CPS Audio Source	MIC SW Spare 9	HSW	Audio Source
Aux. PTT	—	—	—	Aux. Audio
D PTT	—	—	—	Desk Mic
E PTT/Soft Tx	Always E	—	—	"E" Mic
E PTT/Soft Tx	Always D	—	—	"D" Mic/GN*
E PTT/Soft Tx	Mic Sw	Active	—	"E" Mic
E PTT/Soft Tx	Mic Sw	—	Inactive	"D" Mic/GN*
E PTT/Soft Tx	Hook Sw	—	Active	"E" Mic
E PTT/Soft Tx	Hook Sw	—	Inactive	"D" Mic/GN*

*Desk mic ("D" Mic) or gooseneck mic (GN) is selected in CPS Audio Source for Dynamic Mic.

System Configuration

Communication channels, input/output ports, paging parameters, paging leading digit assignment, priority marker definition, and transmit timeout are defined using the System Configuration function. Select E from the MAIN menu and then select S from the EDIT menu to display the SYSTEM CONFIGURATION menu.

A. Channel Configuration

Select Channel Configuration from the SYSTEM CONFIGURATION menu to display the Channel Definition window.

To define a new channel, enter a channel number from 1 to 14 and press ENTER. Note that channel 13 and 14 are dedicated to the optional telephone interface card and cannot be assigned to radio control channel cards. If the channel does not exist, the program will prompt to "Create new channel". Answering Y will create a new channel and place the cursor in the channel name field. Enter a channel name and press ENTER. If the channel currently exists, its channel name will be placed in the channel name field to be edited. Answering N or pressing the ESC key will return the cursor to the channel number field.

After entering the channel name, the CHANNEL CONTROL menu will be displayed. Three types of channel control are available: DC, Tone, and Local. The Delete Channel option allows a channel definition to be deleted from the system. Select the control type for the channel and press ENTER.

If DC or Tone Control is selected, the next menu displayed is the PROTOCOL menu. Select Standard or Custom and press ENTER. If standard is selected, then a RADIO CONFIGURATION menu will be displayed. Select the configuration that applies to the channel and press ENTER. The last three windows will be removed from the screen, and the cursor will be placed in the channel number field of the channel definition window.

You may define another channel or press ESC to return to the SYSTEM CONFIGURATION menu.

Section 4. Program Operation

B. Channel Monitor Configuration

This selection allows the definition of the Private Line Monitor control function to be defined for each channel. You will be prompted for the previously defined channel number and the monitor control function to use for that channel.

C. Channel Paging Configuration

The Model 4010 console allows certain paging parameters to be defined on a per-channel basis. The parameters are in effect only during a page transmission and include:

- A keyup delay time before the start of the first page transmission after the transmitter has been keyed up.

- A high frequency de-emphasis feature.

- An inter-stack delay time between pages.

- A unique remote function to be used for paging transmissions only.

See Appendix D, Section D2, Subsection H for a complete description of these features and how to program them.

D. Paging Format Configuration

Each paging format to be used in the Model 4010 console must have certain parameters unique to that format defined and must have a leading digit assigned to it. There are 14 leading digits available to be assigned among the nine different paging formats the Model 4010 console is capable of generating (some of which are optional). This allows multiple variations of the same paging format to be programmed into the Model 4010 by assigning each one its own unique leading digit. For example, leading digits 3, 4, and 5 might each be assigned to the DTMF paging format but with a different on/off-timing defined for each of the three formats.

See Appendix D for a complete description of these features and how to program them.

E. Edit Custom Calls

This selection in the SYSTEM CONFIGURATION menu allows the complete definition of up to 255 custom two-tone pages (such as Plectron). See Appendix D for a complete description of this procedure.

F. Input/Output Configuration

This function allows the system Auxiliary Input/Output ports to be configured and defined.

Auxiliary Input Port numbers 9-38 are assigned to the optional Expanded Aux. I/O Card(s) (Part No. 702-9448) as follows: 9-14 to the first Aux. I/O Card, 15-20 to the second Aux. I/O Card, etc. This allows the Model 4010 to support up to five Aux. I/O cards (30 ports).

Auxiliary Input Port numbers 1-8 are assigned to the Model 4010 main PC board Spare/Aux. inputs (on connector P8) if these inputs have been configured as auxiliary inputs. If the inputs have been defined as spare inputs instead (the default), Auxiliary Input Port numbers 1-8 are unavailable and cannot be selected in the following menus

Auxiliary Output Port numbers 9-38 are assigned to the optional Expanded Aux. I/O Card(s) in the same manner as the input ports as described above.

Auxiliary Output Port numbers 1-8 are assigned to the Model 4010 main PC board Spare/Aux. outputs (on connector P7) if these outputs have been configured as auxiliary outputs. If the outputs have been defined as spare outputs instead (the default), Auxiliary Output Port numbers 1-8 are unavailable and cannot be selected in the following menus.

Select Input/Output Configuration from the SYSTEM CONFIGURATION menu and press ENTER.

The next menu allows you to define all the system's input and output ports and set the mode of Model 4010 main PC board Spare/Aux. inputs and outputs. To define the auxiliary ports, select either "Inputs" or "Outputs" and press ENTER. The Input and Output ports are defined in exactly the same way.

To create a new input port, enter a port number between 1 and 38 or 9 and 38, and press ENTER. If the port does not exist, the program will prompt "Create new input". Answer Y if a new input port is to be created. Answer N or press ESC if the port is not to be created. After answering Y, the cursor will be placed into the Input Name field. Enter a descriptive name and press ENTER.

To edit the name of the existing input port, enter the port number or use the UP and DOWN arrow keys to move through the currently defined ports and press ENTER. The cursor will be placed in the Input Name field. Edit the name and press ENTER.

To create or edit output ports, follow the same procedure as input ports.

To set the mode of the main PC board Spare/Aux. inputs and outputs, select "Spare Input/Output Mode". The next window will allow you to define the input and output modes separately. If a Spare input or output mode is chosen (by selecting N, the default), the selection of auxiliary port numbers 1-8 will be disabled from all subsequent auxiliary menu selections.

G. Transmit Timeout

The transmit timeout is the maximum amount of time a channel can be keyed up before it is automatically released. The default timeout period is three minutes.

Select TX Timeout from the SYSTEM CONFIGURATION menu. Enter a timeout time from 1 to 10 minutes or zero for no timeout, and press ENTER.

Section 4. Program Operation

H. Priority Marker Frequency

Enter the frequency for the priority marker tone in Hertz between 600 and 2000 Hz and press ENTER.

I. Priority Marker Duration

Enter the duration of the priority marker tone between 50 and 1000 milliseconds and press ENTER.

J. Priority Marker Interval

Enter the time interval between priority marker tones between 1 and 300 seconds and press ENTER.

K. Priority Marker Amplitude

Enter amplitude of the priority marker tone between 1 and 100 percent and press ENTER.

PRINTING KEY AND SYSTEM CONFIGURATIONS

The List function produces hard copy reports of key and system configurations. From the MAIN menu, select L to display the LIST menu.

Before making a selection from this menu, make sure the printer is turned on and paper has been loaded.

Select Key Configuration to print a graphical representation of the two programmable key panels, showing which keys have been defined and their definitions.

Select System Configuration to print the channel, paging, and auxiliary input/output port configuration.

Once a report has begun printing, pressing the ESC key will cancel the report.

PROGRAMMING A MODEL 4010

The Program function transfers the Model 4010 system configuration from the computer to the Model 4010. After the system has been defined, its configuration may be programmed into the console.

Select P from the MAIN menu to display the PROGRAM menu and programming instruction windows.

Connect one end of the supplied serial cable to the COMB phone jack on the right side of the Model 4010 console. Connect the other end of the cable to serial port COM1 or COM2 on the computer. See Figure 4-13.

Serial port COM1 is the default port for CPS to use for programming. If the cable was connected to COM2, select Set Communications Parameters from the PROGRAM menu.

4-18   025-9229C.1

Select Communications Port from the next menu and finally select COM2 from the COMMUNICATIONS PORT menu. Press ESC to return to the PROGRAM menu.

When the cable is connected between the computer and the console, locate a small slide switch on the bottom of the console. Lift the front of the Model 4010 and find the switch at the center of the bottom panel. Slide the switch to the left.
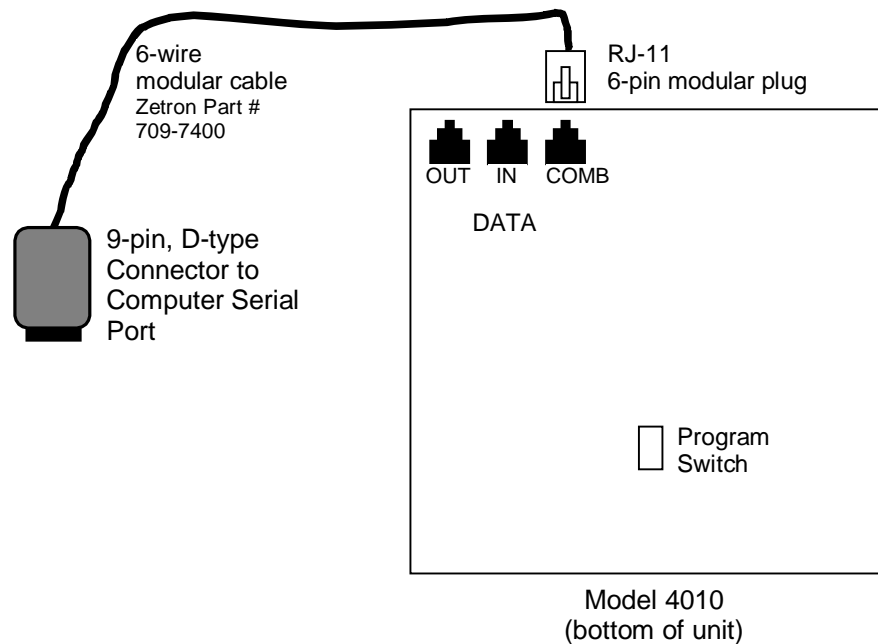

Figure 4-13. Programming Interconnection

The console's display should now display "PROGRAM". If not, try sliding the switch back and forth until the display shows "PROGRAM". From the PROGRAM menu, select Program Console and press ENTER. If everything is properly connected, the display on the console should show "DnLoading CPS". After a few seconds, the display will show "DONE" indicating that the programming is complete. Unplug the cable from the Model 4010 and move the slide switch to the other position. At this time, the console will reinitialize itself. After re-initialization, the display should show the name of the configuration file (minus the extension) used to program the console and the console control program firmware version number.

The console is now ready to use. Press ESC to return to the MAIN menu.

UPLOADING A SYSTEM CONFIGURATION TO A PC

The Upload function transfers a previously downloaded system configuration back up to the computer. The configuration can then be modified, saved to disk, and/or used to program another console. The only information not retained are the optional channel and auxiliary I/O names because these are not part of the data when downloading to the console. These names are included, however, when saving a configuration to disk.

Select U from the MAIN menu to display the UPLOAD menu and the uploading instruction window.

Connect the serial cable and prepare the console as described above to the point where the console displays "PROGRAM". From the UPLOAD menu, select Upload and press ENTER. The console now checks its internal configuration data and sends it to the PC while displaying "UpLoading CPS" if the data is valid. After a few moments, the display shows "**DONE**" to indicate the upload is finished. In CPS, the file name of the uploaded configuration is displayed in the status line at the bottom of the screen. You may now examine, modify, and save the configuration.

QUITTING CPS

The Quit function exits CPS and returns control back to the operating system. Before actually exiting, the program checks to see if any modifications have been made. If so, the program will prompt "Changes have been made to the configuration. Do you wish to save the changes before exiting." Answering Y will cause the program to act as if the Write function was selected from the MAIN menu. After saving the configuration to the disk, the program will exit. Answering N will exit the program without saving the configuration.

APPENDIX A. TONE-REMOTE FUNCTION DEFINITION

Tone Freq.	T1R1	T2R2	T4R4	T8R8
650Hz	—	—	—	—
750Hz	—	—	—	—
850Hz	—	—	—	F8
950Hz	—	—	—	F7
1050Hz	PL4/WC 2 OFF	PL4/WC 2 OFF	WC 2 OFF	F6
1150Hz	PL3/WC 2 ON	PL3/WC 2 ON	WC 2 ON	F5
1250Hz	PL2/WC 1 OFF	PL2/WC 1 OFF	F4	F4
1350Hz	PL1/WC 1 ON	PL1/WC 1 ON	F3	F3
1450Hz	RPTR ON	RPTR ON	RPTR ON	RPTR ON
1550Hz	RPTR OFF	RPTR OFF	RPTR OFF	RPTR OFF
1650Hz	R2 ON	R2 ON	—	—
1750Hz	R2 OFF	R2 OFF	—	—
1850Hz	F1 W/O PL	F2	F2	F2
1950Hz	F1	F1	F1	F1
2050Hz	PL MON	PL MON	PL MON	PL MON

APPENDIX B. DC-REMOTE FUNCTION DEFINITION

Current	T1R1 STD	T1R1 PAGING	T2R2	T4R4
0.0 mA	RX	RX	RX	RX
+ 2.5 mA	—	—	—	—
+ 5.0 mA	F1	—	F1	F1
+ 7.5 mA	—	—	—	—
+10.0 mA	—	—	—	—
+12.5 mA	RPTR ON	F1 W PL	F2	F2
+15.0 mA	—	—	—	—
+15.5 mA	—	—	—	—
- 2.5 mA	PL MON	PL MON	PL MON	PL MON
- 5.0 mA	RPTR OFF	—	R2 OFF	F3
- 7.5 mA	—	—	—	—
-10.0 mA	—	—	—	—
-12.5 mA	—	F1 W/O PL	—	F4
-15.0 mA	—	—	—	—
-15.5 mA	—	—	—	—

APPENDIX C. GENERATING MOTOROLA/GE CONTROL CURRENTS

Standard Motorola and GE DC Remote Control currents may be generated with Model 4010 DC Channel cards.

Normally, the available positive and negative currents, which are based on 2.5 mA increments, will achieve proper control of DC Remote Controlled base stations. However, a feature on the DC Channel card allows alternate Motorola and GE currents to be achieved. This is done using the Console Programming System (CPS) custom DC programming option in the SYSTEM CONFIGURATION menu and the channel configuration switches on the back panel of the Model 4010 console.

If the "A" channel of a Dual Channel Card needs Motorola/GE standard currents, set bit switch 3 of the card's configuration switch to the ON position.

If the "B" channel of the Dual Channel Card needs Motorola/GE standard currents, set bit switch 7 of the card's configuration switch to the ON position.

Then using CPS, locate the SYSTEM CONFIGURATION menu and program all DC channels that require the standard Motorola/GE currents as "DC custom currents". Then using the conversion table below, locate the desired Motorola/GE current and find the "CPS current" to program.

Desired Current (Motorola/GE)	CPS Current
0 mA	0 mA
+ 2.5 mA	+ 2.5 mA
+ 5.5 mA	+ 5.0 mA
+ 6.0 mA	+ 7.5 mA
+11.0 mA	+10.0 mA
+12.5 mA	+12.5 mA
+15.0 mA	+15.0 mA
+15.5 mA	+15.5 mA
- 2.5 mA	- 2.5 mA
- 5.5 mA	- 5.0 mA
- 6.0 mA	- 7.5 mA
-11.0 mA	-10.0 mA
-12.5 mA	-12.5 mA
-15.0 mA	-15.0 mA
-15.5 mA	-15.5 mA

APPENDIX D. CPS MENU STRUCTURE

APPENDIX D. CPS MENU STRUCTURE

PURPOSE

This appendix explains and clarifies all the options and key functions that can be programmed into the Zetron Series 4010 dispatch console using CPS (Console Programming System). CPS creates or modifies a configuration file for the Series 4010 dispatch consoles.

Each menu you encounter while programming the console is explained along with a brief description of the effects.

The CPS menu structure diagram on the last page shows the hierarchy of CPS menus. The menus under the Edit menu are described in the "EDIT" subtopic. The other menus are described in the final subtopic.

Top Menu
After loading and starting the program, the top-level MAIN menu will be displayed (see Figure D-1). Using the arrow keys or the highlighted letter, select the desired function.

```
━━━━━━━━━━━━━━━━━━━━━ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ━━━━━━━━━━━
  Select [E]   Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```
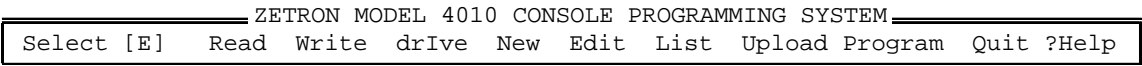
Figure D-1. MAIN Menu

Read	Read a file from disk into the edit buffer
Write	Write the current buffer to disk
Drive	Set the disk drive and directory path for Read or Write
New	Start a new configuration file
Edit	Edit the current configuration file
List	Print the current configuration file
Upload	Upload the console configuration to the PC
Program	Download the current configuration file to the console
Quit	Return to DOS
? Help	Get the help menu

EDIT

The edit menu allows the creation or modification of a Model 4010 console configuration file. Upon choosing this menu from the MAIN menu, you will have the choice of either defining the system parameters or a Model 4010 key panel. The choices are "System Configuration" or "Position Configuration" (key panel configuration). Type S or P, or use the UP and DOWN ARROW keys to select from the menu shown in Figure D-2.

```
══════════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════════
  Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help


                                    ┌──────────────────────────┐
                                    │ Position configuration   │
                                    │ System configuration     │
                                    │                          │
                                    │ Selection [P]            │
                                    └──────────────────────────┘
```

Figure D-2. EDIT Menu

Position Configuration

This menu (see Figure D-3) allows you to assign Model 4010 key functions and define certain system options. Use the UP and DOWN ARROW keys or type the letter in the first column to select the desired menu item.

```
══════════════════ ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM ══════════════
  Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help


                              ┌───────────────────────────┐
                            P.│ A. Key Definition         │
                            S │ B. Position Layout        │
                              │ C. Audio Control          │
                            S │ D. ANI Decode / Display   │
                              │ E. Display Operation      │
                              │ F. Miscellaneous          │
                              │                           │
                              │ Selection [A]             │
                              └───────────────────────────┘
```

Figure D-3. POSITION CONFIGURATION Menu

A. Key definition

In this menu (see Figure D-4), you will be asked to select the key panel that you are defining.

```
                  ═══ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM═══
 Select [E]    Read   Write   drIve   New   Edit   List   Upload Program   Quit ?Help
```

```
                          ┌────────────────────────┐
                          │ P┌─────────────────────┴──────┐
                          │ S│ Upper Panel                 │
                          │  │ Lower Panel                 │
                          │ S│ Spare Inputs      .splay    │
                          │  │                   .on       │
                          │  │ Selection [U]               │
                          │  └─────────────────────────────┤
                          │      Selection [A]              │
                          └─────────────────────────────────┘
```
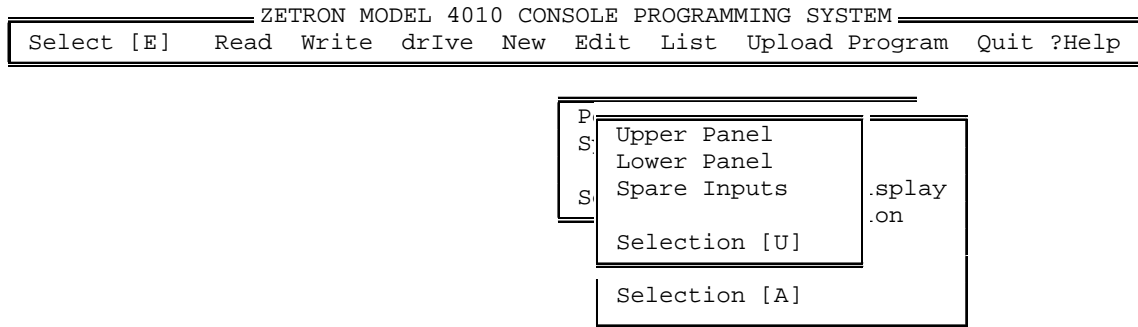
Figure D-4. PANEL SELECTION Menu

Note that the third selection "Spare Inputs" will only be present if the main PC board Spare/Aux. Inputs have *not* been defined as "Auxiliary Inputs" in the SYSTEM CONFIGURATION menu (this is the default). The Spare Inputs represent eight contact closure inputs (on connector P8), which can be programmed with any valid function, just like a panel key. When the spare input is grounded, its function will be executed.

After selecting the appropriate panel, you will see a "key map" of the particular panel that you are configuring. All key definitions are performed from this screen. Use the arrow keys to position the cursor on the key to be defined, examined, or modified and press ENTER. You will then see the menu shown in Figure D-5.

```
┌──────────────────────────────────────────┐
│ [D]   Define  Erase   Move   Copy   Spare │
└──────────────────────────────────────────┘
```
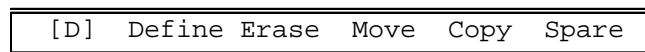
Figure D-5. KEY EDITING Menu

Use the arrow keys to select the desired function or type one of the highlighted letters.

1) Define

Any key may be programmed (Defined) for any valid function. Select from the menu shown in Figure D-6 the desired function to be assigned to the selected key.

```
┌────────────────────────────────────┐
│ A. Channel Functions               │
│ B. System Functions                │
│ C. Extended Channel Functions      │
│ D. Auxiliary Input / Output        │
│ E. Custom Channel Functions        │
│                                    │
│        Selection [A]               │
└────────────────────────────────────┘
```

Figure D-6. KEY FUNCTIONS Menu

a) Channel Functions

To define a channel function, you must first enter a channel number (or select one with the UP and DOWN ARROW keys) and press ENTER (see Figure D-7). The channel must have

been previously defined using the SYSTEM CONFIGURATION menu. If an undefined channel is entered, you will be notified and a different channel must be selected or you must go back to the channel configuration menu. Channel functions are usually assigned to the upper key panel.

```
╒══════════════ CHANNEL FUNCTIONS ══════════════╕
│                                                │
│    Enter Channel Number from 1 to 14           │
│                                                │
│    Channel Number [ ]                          │
│                                                │
╘════════════════════════════════════════════════╛
```
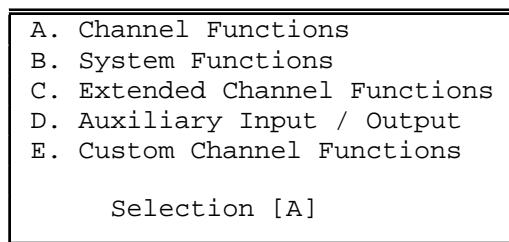
Figure D-7. Channel Function Window

After selecting a channel number, select a function from the menu shown in Figure D-8.

```
┌───────────────────────────────┐  P┌═════════════ CHANNEL FUNCTIONS ═════════════╕
│  Channel Number: 1            │  S│                                              │
│                               │   │  A. Select                                   │
│  Channel Name:   Channel One  │  S│  B. Frequency Select                         │
│                               │   │  C. Frequency Select with Voting             │
│  Type of Channel: Tone Control│   │  D. Instant Select                           │
│                               │   │  E. Instant Select with Voting               │
│  Standard T2R2/T22R with PL   │   │  F. Instant Transmit                         │
│                               │  ]│  G. Volume Keys                              │
│  Emergency ANI ACK: disabled  │   │  H. Patch                                    │
└───────────────────────────────┘  ]│  I. Main / Standby                           │
  [  ] [  ] [  ] [  ] [  ] [  ]      │  J. ANI Source                               │
                                     │  K. Site Intercom                            │
  [  ] [  ] [  ] [  ] [  ] [  ]      │  L. Monitor                                  │
                                     │  M. Phone ON/OFF Hook                        │
  [  ] [  ] [  ] [  ] [  ] [  ]      │  N. Phone Hook Flash                         │
                                     │                                              │
  [  ] [  ] [  ] [  ] [  ] [  ]      │     Selection [A]                            │
                                     ╘══════════════════════════════════════════════╛
  [  ] [  ] [  ] [  ] [  ] [  ]
```

Figure D-8. CHANNEL FUNCTIONS Menu

SELECT

This function will "select" the appropriate channel for transmission when a transmit key is pressed. The received audio from the selected channel will be heard on the "Select" speaker. All other received audio will be routed to the "Unselect" speaker. All channels must have one and only one "Select" key assigned.

FREQUENCY SELECT

This function is only applicable with a tone or DC controlled radio with multiple frequency capability. By pressing this key, the desired frequency command will be sent. You will be asked to choose a DC current or Function tone from Table D-1 that will be sent to the radio in order to select the desired frequency.

Please note that "No current" is different from "0.0 ma". Selecting "0.0 ma" will cause zero milliamperes of DC control current to be sent when this command is executed. Selecting "No

current" will cause the previous control current for that function to be maintained; that is no current change.

Table D-1. Receive Function

DC Controlled Channel Receive Function		Tone Controlled Channel Receive Function
A. No current		A. No Tone
B. + 2.5 ma		B. 650 HZ
C. + 5.0 ma		C. 750 HZ
D. + 7.5 ma		D. 850 HZ
E. +10.0 ma		E. 950 HZ
F. +12.5 ma		F. 1050 HZ
G. +15.0 ma		G. 1150 HZ
H. +15.5 ma		H. 1250 HZ
I. 0.0 ma		I. 1350 HZ
J. - 2.5 ma		J. 1450 HZ
K. - 5.0 ma		K. 1550 HZ
L. - 7.5 ma		L. 1650 HZ
M. -10.0 ma		M. 1750 HZ
N. -12.5 ma		N. 1850 HZ
O. -15.0 ma		O. 1950 HZ
P. -15.5 ma		P. 2050 HZ
DC Current [A]		Tone Frequency [A]

After selecting the receive current/tone, you must also specify (see Table D-2) a current or tone to activate the transmitter for the desired frequency.

Table D-2. Transmit Function

DC Controlled Channel Transmit Function		Tone Controlled Channel Transmit Function
A. No current		A. No Tone
B. + 2.5 ma		B. 650 HZ
C. + 5.0 ma		C. 750 HZ
D. + 7.5 ma		D. 850 HZ
E. +10.0 ma		E. 950 HZ
F. +12.5 ma		F. 1050 HZ
G. +15.0 ma		G. 1150 HZ
H. +15.5 ma		H. 1250 HZ
I. 0.0 ma		I. 1350 HZ
J. - 2.5 ma		J. 1450 HZ
K. - 5.0 ma		K. 1550 HZ
L. - 7.5 ma		L. 1650 HZ
M. -10.0 ma		M. 1750 HZ
N. -12.5 ma		N. 1850 HZ
O. -15.0 ma		O. 1950 HZ
P. -15.5 ma		P. 2050 HZ
DC Current [C]		Tone Frequency [A]

FREQUENCY SELECT WITH VOTING

This function is identical to the frequency select function with the added feature of selecting by an auxiliary input, see Figure D-9. This allows the output of a voter to indicate which frequency was voted. The red LED will be illuminated for the frequency that voted.

```
 ══════  VOTING AUX INPUT  ══════

 Input Number [____]

 Input Name    [                    ]
```

Figure D-9. Voting AUX Input Window

The auxiliary input must have been previously defined using the SYSTEM CONFIGURATION menu before using this key.

INSTANT SELECT

Instant Select differs from the normal Select function in that after the Select is performed, a DC or Tone control function is sent. This is normally used on a multi-frequency base station to select a channel at a desired frequency. Several Instant Select keys may be assigned to a single channel even though only one can be active at a time.

INSTANT SELECT WITH VOTING

If you chose instant select with voting, you must also pick the Auxiliary input that will receive the voter result. This key's LED will be illuminated whenever the voter picks this particular input. The Auxiliary input must have been previously defined using the SYSTEM CONFIGURATION menu. After typing the input number or picking an input with the UP and DOWN ARROW keys, the name of the input will be shown.

Please note that this is an indication of the voter result only. The channel is not selected by the voter input.

INSTANT TRANSMIT

The Instant Transmit function will cause the transmitter on the assigned channel to activate even though the channel is not selected. The selected channel will not be affected.

If this function is assigned to a spare input on a multi-frequency channel, an additional menu is presented to allow for the selection of a unique Remote TX Function appropriate for the type of channel being programmed (F1-F8 or Custom DC/Tone). The first choice in these menus is always "None", allowing the Remote TX Function to remain unchanged. If any other choice is made, it immediately takes effect when the spare input is activated and it remains in effect until changed, updating the appropriate LED annunciators.

VOLUME KEYS

Select the desired volume function to be assigned to the current key from the menu shown in Figure D-10.

```
A. Volume Adjust (knob)
B. Mute Adjust   (knob)
C. Volume Up     (knob)
D. Volume Down   (knob)
E. Volume Mute

Volume Key [A]
```

Figure D-10. VOLUME KEYS Menu

VOLUME ADJUST (KNOB)

The volume adjust key allows the volume of a specific channel to be set or changed at the console. Pressing the key will cause the current volume level (in percentage) to be displayed. Turning the "channel volume" knob while holding the key down will cause the volume level to be changed with the new value displayed on the console LCD.

MUTE ADJUST (KNOB)

This is a dual function key and is more correctly called the "mute/volume adjust". Pressing and releasing the key causes the channel's received audio to be muted. The red light by the key will remain on while the channel is muted. Pressing again will unmute the channel. Pressing and holding this key will allow the channel volume to be set as described in the above paragraph, "Volume Adjust".

VOLUME UP (KEY)

This key is assigned to a specific channel to allow "one hand" volume adjusting. Pressing this key will cause the current volume setting to be displayed. Holding the key will cause the volume to be adjusted upwards. Releasing the key will cause the volume to be set to the displayed level. The red key indicator will illuminate while the key is pressed.

VOLUME DOWN (KEY)

This key is assigned to a specific channel to allow "one hand" volume adjusting. Pressing this key will cause the current volume setting to be displayed. Holding the key will cause the volume to be adjusted downwards. Releasing the key will cause the volume to be set to the displayed level. The red key indicator will illuminate while the key is pressed.

VOLUME MUTE

The Volume Mute key will cause the specific channel's volume to be "muted" to the mute pre-set value. The red LED associated with the key will illuminate showing that the channel is muted.

PATCH

The patch key, when activated, will connect the channel with other patched channels. When audio is received on one of the patched channels, the other transmitter(s) will be activated as long as the audio is active. The patch keys on at least two channels must be activated in order to have any effect.

MAIN/STANDBY

This key activates the channel's Auxiliary output line. It is normally used to select a standby transmitter but can be used for other functions if desired. Each channel has one auxiliary output line.

ANI SOURCE

This function is assigned to the switch's lights only. The ANI option must be installed for this function to have meaning. Whenever a valid ANI is displayed, the ANI source light for the channel that received the ANI will illuminate. This light will be illuminated (flashing) until the ANI review key is activated.

SITE INTERCOM

The site intercom key allows the console operator to communicate with the radio site by using the audio lines as an intercom path. When this key is pressed, only the audio is sent to the channel; the transmitter is not keyed.

MONITOR

This key will send the correct command (current or tone) to disable the private line or channel guard feature of the radio allowing the received audio to be heard at the console. The indicator LED will remain on until the channel's transmitter is keyed. This key is functionally the same as the "Monitor" key on the lower panel.

PHONE ON/OFF HOOK

This key will activate the auxiliary output line of the designated channel. It is intended to be used as an "off hook" signal to answer an incoming phone line when the optional telephone interface card is installed. Each channel has one auxiliary output line.

PHONE HOOK FLASH

The phone Hook Flash key will cause the On/Off Hook line to be deactivated for 500 ms thereby putting the phone on "hold". Hit the key again to enable the phone conversation. This function is usually only used with the optional telephone interface card.

b) System Functions

The functions shown in Figure D-11 are assigned to individual keys but may affect more than a single channel. They are usually assigned to the lower key panel.

```
════ SYSTEM FUNCTIONS ════
A.  Transmit Keys
B.  Monitor
C.  Site Intercom
D.  Alert
E.  Mute Keys
F.  Simultaneous Select
G.  Group Keys
H.  Priority Marker
I.  Speaker / Headset
J.  Diagnostics Reset
K.  Clock Set
L.  ANI Keys
M.  Channel Test
N.  Phone Keys
O.  Paging Keys

    Selection [A]
```
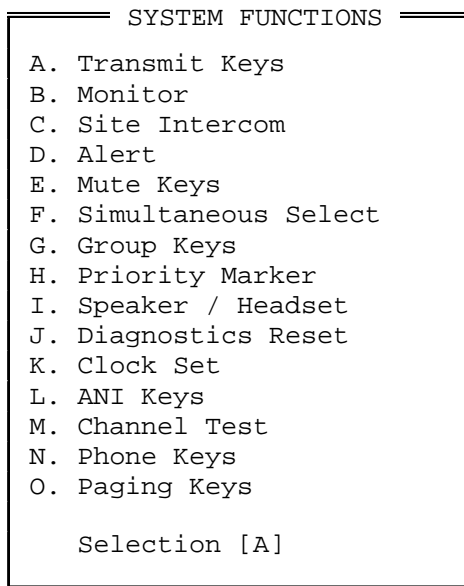
Figure D-11. SYSTEM FUNCTIONS Menu

TRANSMIT KEYS

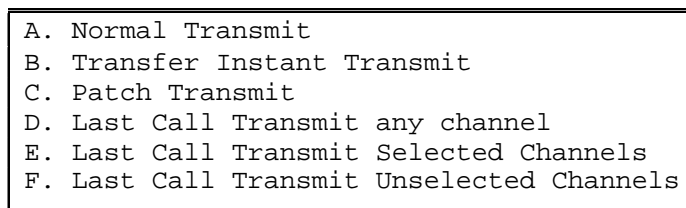The transmit functions shown in Figure D-12 may be assigned to a specific key.

```
A.  Normal Transmit
B.  Transfer Instant Transmit
C.  Patch Transmit
D.  Last Call Transmit any channel
E.  Last Call Transmit Selected Channels
F.  Last Call Transmit Unselected Channels
```

Figure D-12. TRANSMIT KEYS Menu

NORMAL TRANSMIT

This key will cause the selected channel(s) to transmit. This is functionally the same as the optional foot-operated PTT switch.

TRANSFER INSTANT TRANSMIT

This key, when pressed, will cause the next channel "Select" key pressed to become an "instant transmit" key for the channel. The selected channel will not change. This key is used to eliminate the need for individual Instant transmit keys on each channel.

PATCH TRANSMIT

This key allows the operator to transmit on all the channels that are currently patched. This key only functions when there is no "call" activity on any of the patched channels.

LAST CALL TRANSMIT ANY CHANNEL

This key will cause the last channel that had received audio ("Call" activity) to transmit. The channel will not be selected.

LAST CALL TRANSMIT SELECTED CHANNELS

This key will cause the last "Selected" channel that had received audio ("Call" activity) to transmit. The channel will not be selected.

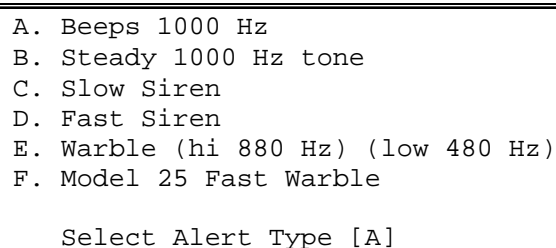LAST CALL TRANSMIT UNSELECTED CHANNELS

This key will cause the last "Unselected" channel that had received audio ("Call" activity) to transmit. The channel will not be selected.

MONITOR

This key causes the programmed PL monitor current or tone to be sent to the "Selected" channel, thereby disabling the "private line" feature on the radio.

SITE INTERCOM

The site intercom key allows the console operator to communicate with the "Selected" radio site by using the audio lines as an intercom path. When this key is pressed, only the audio is sent to the channel; the transmitter is not keyed.

ALERT

This key causes the desired alert tone to be transmitted on the "Selected" channel. The alert will be sent as long as the key is held down. Select an alert from the menu shown in Figure D-13

```
A. Beeps 1000 Hz
B. Steady 1000 Hz tone
C. Slow Siren
D. Fast Siren
E. Warble (hi 880 Hz) (low 480 Hz)
F. Model 25 Fast Warble

   Select Alert Type [A]
```

Figure D-13. ALERT Menu

BEEPS

This key causes a continuous 1-kHz beeping sound to be transmitted on the "selected" channel as long as the key is activated.

STEADY TONE

This key causes a continuous 1-kHz tone to be transmitted on the "selected" channel. This tone can be used for calibrating the console equipment or as an indication on the channel.

SLOW SIREN

This key causes a slow siren-like sound to be transmitted on the "selected" channel.

FAST SIREN

This key causes a fast siren-like sound to be transmitted on the "selected" channel.

WARBLE
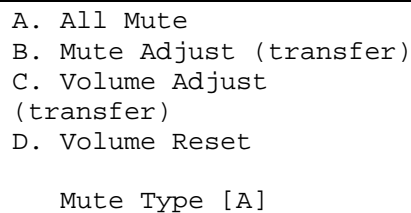
This key causes a warble-like sound to be transmitted on the "selected" channel.

MODEL 25 FAST WARBLE

This key generates a fast warble sound to the "Selected" channel. This warble is similar to the same function on the Model 25.

MUTE KEYS

Choose from the menu shown in Figure D-14 to select the desired mute/volume option.

```
A. All Mute
B. Mute Adjust (transfer)
C. Volume Adjust
(transfer)
D. Volume Reset

   Mute Type [A]
```

Figure D-14. MUTE KEYS Menu

ALL MUTE

This "All Mute" function key will cause the audio from all "Unselected" channels to be muted. The "selected" channel will be unaffected. If a muted channel is "selected", it will be unmuted as long as it is selected. If it becomes "unselected", it may become muted again if the "all mute" function has not been toggled.

MUTE ADJUST (TRANSFER)

Pressing this key will cause the next "select" key pressed to become a "Mute/Volume adjust" key. This eliminates the need for a separate Mute adjust key for each channel.

VOLUME ADJUST (TRANSFER)

Pressing this key will cause the next "select" key pressed to become a "Volume adjust" key. This eliminates the need for a separate Mute adjust key for each channel.

VOLUME RESET

This key will cause the received audio level of the selected channel to be set to its default level, usually 50%.

SIMULTANEOUS SELECT

Holding this key and pressing channel "Select" keys will cause multiple channels to be "Selected". All the channels thus selected will transmit when the transmit key is pressed and all their received audio will be routed to the "Select" speaker. This same procedure can be used to deselect currently selected channels, i.e.; this function acts as a toggle.

GROUP KEYS

The Group keys allow channels to be "Grouped" together so that a single key can perform a "Select" or "Instant Transmit" on several channels simultaneously. Choose from the menu shown in Figure D-15 to select the desired group key option.

When a multi-frequency channel is enabled in the Group Select window, an additional menu is presented to allow for the selection of a unique Remote TX Function appropriate for that type of channel (F1-F8 or Custom DC/Tone). The first choice in these menus is always "None", allowing the Remote TX Function to remain unchanged. If any other choice is made, it immediately takes effect when the key is pressed on the console and it remains in effect until changed, updating the appropriate LED annunciators.

```
A. All Mute
B. Mute Adjust (transfer)
C. Volume Adjust (transfer)
D. Volume Reset

   Mute Type [A]
```

Figure D-15. GROUP KEYS Menu

GROUP SELECT

The group select key allows a set of predefined channels to be selected with a single key. Use the GROUP SELECT menu shown in Figure D-16 to add or delete a channel for this group. Several group keys may be defined. A channel may be a member of several different groups. If a channel has not been defined, it will not appear in the GROUP SELECT menu.

The menu in Figure D-16 shows that channels 2 and 4 will be selected when this key is pressed.

```
 ━━━━━━━━━ GROUP SELECT ━━━━━━━━━
│ CH 1 [ ]                        │
│ CH 2 [ ]                        │
│ CH 3 [ ]                        │
│ CH 4 [ ]                        │
│ CH 5 [ ]                        │
│ CH 6 [ ]                        │
│ CH 7 [ ]                        │
│ CH 8 [ ]                        │
│                                 │
│    Enter 'E' to select a channel,│
│    a space to disable a channel.│
│ ━ Press ESC when you are finished ━│
```

Figure D-16. GROUP SELECT Menu

GROUP INSTANT TX

The group instant transmit key will cause all channels of the group to transmit with a single key. Use the menu shown in Figure D-17 to add or delete channels for this group. A channel may be a member of several different groups. If a channel has not been defined, it will not appear in the GROUP INSTANT TX menu.

```
 ━━━━━━━ GROUP INSTANT TX ━━━━━━━
│ CH 1 [E]                        │
│ CH 2 [ ]                        │
│ CH 3 [ ]                        │
│ CH 4 [ ]                        │
│ CH 5 [ ]                        │
│ CH 6 [E]                        │
│ CH 7 [ ]                        │
│ CH 8 [ ]                        │
│                                 │
│    Enter 'E' to select a channel,│
│    a space to disable a channel.│
│ ━ Press ESC when you are finished ━│
```

Figure D-17. GROUP INSTANT TX Menu

The menu in Figure D-17 shows that channels 1 and 6 will transmit when this key is pressed.

PRIORITY MARKER

To cause the priority marker to be sent when this key is pressed, enter the channel number for a specific channel, T, or S in the menu shown in Figure D-18. S will cause the marker to be sent on the "Selected" channel. T will cause the marker to be sent to channel of the next "select" key pressed.

```
═══════ PRIORITY MARKER ═══════
Enter Channel Number from 1 to 14
        'T' for Transfer
        'S' for selected channel


        Selection [__]
```

Figure D-18. PRIORITY MARKER Menu

SPEAKER/HEADSET

This key will cause the speaker audio to be toggled between the speakers and headset. The green LED will indicate that the audio is routed to the speaker; the red LED will indicate the headset is receiving the audio.

Please note that jumpers are available on the console main PC board to allow "Selected" or "Unselected" audio to be "locked" to the speakers or headset thus negating the function of this key.

DIAGNOSTICS RESET

By programming this key, any diagnostic messages displayed on the console will be held until the key is pressed. If this key is not assigned, the diagnostic will be removed after approximately 3 seconds or when the next key is pressed.

CLOCK SET

By programming this key, clock setting can be initiated by pressing the "CLOCK SET" key on the key panel.

The first time the "CLOCK SET" key is pressed, the seconds-unit on the time display will be highlighted with an underscore. The seconds-unit may be adjusted up or down using the "CHANNEL VOLUME" knob. When the desired number of seconds have been set, press the "CLOCK SET" key again.

In a similar manner, each time you press the "CLOCK SET" key, another time unit will be highlighted in the display, until the entire time and date have been set. The units are adjusted starting with seconds, then minutes, hours, month, day, and finally year. The display will automatically show the date once the three units of the time of day have been set. You may distinguish a time display from a date display by the colon (:) units separator used for time versus the slash (/) units separator used for date.

ANI KEYS

The ANI (Automatic Number Identification) keys only function if the optional ANI software is installed in the console. Choose the key function from the menu shown in Figure D-19.

```
┌─────────────────────────────────┐
│ A. ANI Review                   │
│ B. ANI Select                   │
│                                 │
│ Select ANI Key Type [B]         │
└─────────────────────────────────┘
```

Figure D-19. ANI KEYS Menu

ANI REVIEW

Because ANIs are received from various radios, they will be decoded and stored in a "stack" in memory. The ANIs are reviewed and removed from the stack by repeatedly pressing this key. The LED associated with this key will blink as long as an ANI remains in the stack.

ANI SELECT

Pressing the ANI Select key will cause the channel that received the ANI showing in the display to be "Selected".

CHANNEL TEST

This key is for diagnostic use only. Pressing this key will cause all indicator LEDs to light for any channel which is currently inoperable.

PHONE KEYS

These keys are used only if the optional Telephone Interface Card (Part No. 702-9403) is installed in the console. The transfer keys are used to cause the next channel select key pressed to perform the indicated function, eliminating the need for individual function keys on each channel. Choose the phone key option from the menu shown in Figure D-20.

```
┌─────────────────────────────────────┐
│ A. Phone ON/OFF Hook (Transfer)     │
│ B. Phone Hook Flash (Transfer)      │
│                                     │
│ Selection [ ]                       │
└─────────────────────────────────────┘
```

Figure D-20. PHONE KEY Menu

PHONE ON/OFF HOOK (TRANSFER)

This key will activate the auxiliary output line of the next channel "Selected". It is intended to be used as an "off hook" signal to answer an incoming phone line when the optional telephone interface card is installed. Each channel has one auxiliary output line.

PHONE HOOK FLASH (TRANSFER)

The phone Hook Flash key will cause the On/Off Hook line of the next channel selected to be deactivated for 500 ms thereby putting the phone on "hold". Hit the key again to enable the phone conversation.

PAGING KEYS

Select one of the paging functions shown in Figure D-21 to assign to the key. Note that the "Instant Call" and "Page Safety" functions represent optional features. They can always be programmed, but will generate an error message in the Model 4010 console if the Instant Call Paging option has not been installed.

```
A. Instant Call
B. Page Enter
C. Page Clear
D. Page Send
E. Page Safety

   Selection [A]
```

Figure D-21. PAGING KEYS Menu

INSTANT CALL

An Instant Call key can have multiple pages (called a page stack) assigned to it. Each page in the stack can be a different format (e.g., DTMF, Two-Tone, Alert) and be steered to different channel(s).

Begin by entering the previously defined leading digit representing the desired paging format and then the page code in the window shown in Figure D-22. Press **ENTER** to go on to the next window. The maximum number of page code digits (after the leading digit) allowed is 15. This limit only affects variable length paging formats such as DTMF, Rotary, and Knox. To enter the "*" and "#" digits for these formats, use "E" and "F", respectively.

```
═════════ INSTANT CALL ═════════

Pager code [                    ]
```

Figure D-22. Instant Call Window

Next, select the channel(s) the page is to be transmitted on. The selection window shown in Figure D-23 will only display the channels previously defined via the SYSTEM CONFIGURATION menu. Choosing the "Sel Ch" option will transmit the page on the currently selected channel(s). Press **ESC** to continue to the next window.

```
              Select Channels for paging
 CH 1  [ ]
 CH 2  [ ]
 CH 3  [ ]
 CH 4  [ ]

 Sel Ch [ ]

  Enter 'E' to enable a channel,
  a space to disable a channel.
  Press ESC when you are finished
```

Figure D-23. Select Channels for Paging Window

Finally, from the menu shown in Figure D-24, select whether to add another page to this key's stack, delete this page from the stack, or return to the key map display if the page stack is complete.

```
 A. Done with Instant Call
 B. Stack another page
 C. Delete current page

    Selection [A]
```

Figure D-24. INSTANT CALL COMPLETION Menu

An existing page stack can be edited to some degree using selections B and C. To get to the end of an existing stack to add another page, you must cycle through the three screens shown in Figure D-22 through Figure D-24. Press ENTER or ESC to accept the current values until the last window's default selection shows "Done with Instant Call" (option A). Select "Stack another page" (option B) instead to enter the new page. If the page stack editing required is extensive, it may be easier to erase the key's programming (see the KEY EDITING menu, Figure D-5) and start over.

PAGE ENTER

This paging function is used during manual page entry (via the console DTMF/paging keypad) to terminate the entry and add the page to the stack. The use of this key is only required for variable-length paging formats (i.e., DTMF). Fixed-length paging formats (i.e., Two-Tone and Alerts) are self-terminating.

PAGE CLEAR

If manual page entry (via the console DTMF/paging keypad) is in progress, this function will abort the current key entry sequence and clear the paging display without altering the existing page stack. If a page entry is not in progress, pressing this key will delete all console page stacks. If a page transmission is in progress, it will also immediately abort the page transmission. This function should always be programmed if the Model 4010 console is to be used for paging.

PAGE SEND

This paging function will terminate any manual page entry in progress (as if a PAGE ENTER key had been pressed), and begin transmitting the manual page stack on the currently selected channel(s) in the order the pages were stacked (entered). The page stack is retained and can be transmitted again (on different channel(s), for example) by pressing this key again.

PAGE SAFETY

If this function is programmed, instant-call pages will not be transmitted until this key is pressed, allowing the operator to review the selected instant-call pages before sending them. If this key has not been programmed, pressing an instant-call page key will begin the page transmission immediately.

c) Extended Channel Functions

The additional channel functions shown in Figure D-25 can be assigned to Standard Tone and/or DC controlled channels.
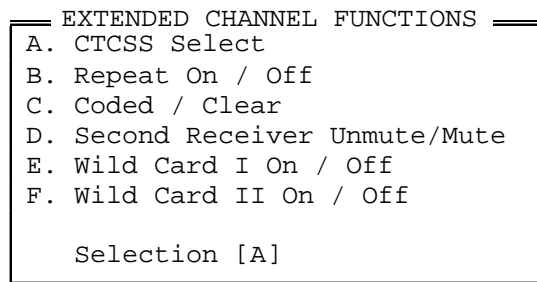
```
════ EXTENDED CHANNEL FUNCTIONS ════
A.  CTCSS Select
B.  Repeat On / Off
C.  Coded / Clear
D.  Second Receiver Unmute/Mute
E.  Wild Card I On / Off
F.  Wild Card II On / Off

    Selection [A]
```

Figure D-25. EXTENDED CHANNEL FUNCTIONS Menu

CTCSS SELECT

This command activates CTCSS (constant tone coded squelch signal) over-ride. This key will cause the PL (private line) feature to be disabled thereby allowing all radio activity to be monitored by the console operator. Refer to Appendix A or B for the actual tone or DC current transmitted.

REPEAT ON/OFF

This key will toggle the radio repeater ON/OFF function on the appropriate channel. Refer to Appendix A or B for the actual tone or DC current transmitted.

CODED/CLEAR

This key will toggle the coded/clear function on the appropriate channel. Refer to Appendix A or B for the actual tone or DC current transmitted.

SECOND RECEIVER UNMUTE/MUTE

This key will toggle the radio Mute on/off function on the appropriate Tone controlled channel. Refer to Appendix A or B for the actual tone transmitted.

WILD CARD I ON/OFF

Toggle the Wild Card I function on the appropriate tone controlled radio channel. Refer to Appendix A or B for the function actually transmitted.

WILD CARD II ON/OFF

Toggle the Wild Card II function on the appropriate tone controlled radio channel. Refer to Appendix A or B for the function actually transmitted.

d) Auxiliary Input/Output

As described in Section 4, "F. Input/Output Configuration", I/O Port numbers 9-38 represent any optional Expanded Aux. I/O Card(s) (Part No. 702-9448) installed in the console. These port numbers can always be defined, but will only be meaningful if the appropriate Expanded Aux. I/O cards are present in the system. Each card has six I/O ports, allowing a maximum of five cards to be installed.

I/O port numbers 1-8 represent the standard main PC board Aux./Spare I/O Ports. If these I/O ports are defined as "Spare" ports (instead of "Auxiliary") in the System Configuration section of the main Edit menu, then Auxiliary Input/Output port numbers 1-8 become unavailable and cannot be selected from any auxiliary port number menu. Conversely, if these I/O ports are defined as "Auxiliary" ports (instead of "Spare") in the System Configuration section of the main Edit menu, then Auxiliary Input/Output port numbers 1-8 are available but all Spare Input and/or Spare Output menu choices are suppressed and not available.

The menu in Figure D-26 shows the selections available for Input/Output functions.

```
    ___ AUXILIARY INPUT / OUTPUT ___
A. Auxiliary Input
B. Auxiliary Output Interlocked
C. Auxiliary Output Toggle
D. Auxiliary Output Momentary
E. Spare Output Latching
F. Spare Output Toggle
G. Spare Output Momentary

    Selection [B]
```

Figure D-26. AUXILIARY INPUT/OUTPUT Menu

For each Auxiliary Output (selections B, C, and D), you will be prompted to select the desired LED configuration from the menu shown in Figure D-27.

```
A.  Output RED active, OFF inactive
B.  Output RED active, GREEN inactive
C.  Input/Output RED output, GREEN input
D.  Input GREEN active, OFF inactive
E.  Input RED active, GREEN inactive
F.  Dual Input ON active, OFF inactive
G.  Alarm Input Latching RED active

    Selection [A]
```

Figure D-27. Input/Output Display Options

Selections A and B allow the key's LEDs to reflect the current state of the auxiliary output. Selection C through F allow one or two auxiliary inputs to be assigned to the key's LEDs and prompt for one or more predefined auxiliary input numbers. Selection G is not implemented at the present time and defaults to Selection E.

AUXILIARY INPUT

By assigning an input to this key, the associated LEDs will reflect the state of the input. Pick the desired input by entering the input number or using the UP and DOWN ARROW keys. The input must have been previously defined using the SYSTEM CONFIGURATION menu.

After selecting the input number in the window shown in Figure D-28, choose the desired LED configuration from the menu shown in Figure D-29.

```
Input Number [1__]

Input Name   [input 1        ]
```

Figure D-28. Input Number Window

```
A.  Input GREEN active, OFF inactive
B.  Input RED active, GREEN inactive
C.  Dual Input ON active, OFF inactive
D.  Alarm Input Latching RED active

    Selection [ ]
```

Figure D-29. LED CONFIGURATION Menu

Only the green LED will be active with selection A. If selection B is chosen, the red and green LEDs will reflect the state of the assigned input.

Two inputs can be assigned to the same key position with selection C. The red LED ON/OFF will show the state of the first input; green ON/OFF will show the state of the second.

Selection D is not implemented at the present time and defaults to selection B.

AUXILIARY OUTPUT INTERLOCKED

Several outputs may be "interlocked" such that only one output can be active at any given moment. That is, when one output goes active, all others will be inactive. Up to 32 interlock groups may be defined with any number of outputs per group.

In the window shown in Figure D-30 enter the desired output number (up to 38), or use the UP and DOWN ARROW keys to select the desired output number. The output number will be accepted if it has been previously defined using the SYSTEM CONFIGURATION menu. Output numbers 1 through 8 will only be allowed if the main PC board Spare/Aux Outputs have been defined as "Auxiliary Outputs" in the SYSTEM CONFIGURATION menu.

```
Output Number [ 1]

Output Name   [door        ]
```

Figure D-30. Output Number Window

Type an interlock group number (1-32) in the window shown in Figure D-31. If the interlock group has been already used, this input will be added to it; if not, a new interlock group will be created.

```
Interlock Group [1_]
```

Figure D-31. Interlock Group Window

AUXILIARY OUTPUT TOGGLE

The chosen output will toggle with this key. That is, press the key once and the output will be activated; press again and the output will deactivate.

AUXILIARY OUTPUT MOMENTARY

As long as this key is pressed, the output will be active; when released, the output will be inactive.

SPARE OUTPUT LATCHING

The eight spare outputs are located on connector 7 on the Model 4010 main PC board.

Note: *If Spare Outputs 7 and 8 are not programmed, they will function as follows:*
   *Spare Output 7:   Will be ON whenever an ANI is displayed on the
                     console.*
   *Spare Output 8:   Will produce a 500 ms pulse every time an ANI is
                     decoded by the console.*

The assigned spare output will toggle on and off with each press of the spare output latching key. The red LED will toggle to show the state of the output.
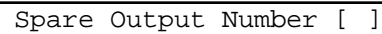
SPARE OUTPUT TOGGLE

The assigned spare output will toggle on and off with each press of this key. The red and green LEDs will toggle to show the state of the output.

SPARE OUTPUT MOMENTARY

The assigned spare output will be activated only as long as the key is pressed. The green LED will blink as long as the key is pressed.

For each spare output assigned, select the desired output number (1-8) in the window shown in Figure D-32.

```
Spare Output Number [ ]
```

Figure D-32. Spare Output Number Window

The three spare output functions will only be available if the main PC board Spare/Aux. outputs have *not* been defined as "Auxiliary Outputs" in the SYSTEM CONFIGURATION menu (this is the default).
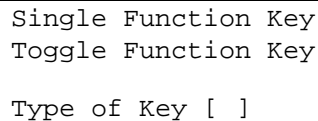
e) Custom Channel Functions

The Custom Channel Functions are used to customize the channels that were defined as "Custom" in the SYSTEM CONFIGURATION menu. Each key must have the desired transmit and receive tones or DC currents assigned.

DC

If the channel is defined as a DC controlled channel, choose the desired current for receive and transmit from Table D-1 and Table D-2.

After choosing the desired DC control function current, you will be asked if you want the key to toggle between two different functions, as shown in Figure D-33. The LEDs will toggle to show the state of the switch.

```
Single Function Key
Toggle Function Key

Type of Key [ ]
```

Figure D-33. Type of Key Window

If you choose the toggle function, you will be asked for the second transmit and receive function currents.

TONE

> If the channel has been defined as a tone controlled channel, you will be asked to
> select the desired transmit and receive tone from the values shown in Table D-1 and
> Table D-2. The receive tone selected will be sent whenever the key is pressed. The
> transmit function will be sent on transmit.
>
> After choosing the desired function frequency, you will be asked if you want the key
> to toggle between two different functions, as shown in Figure D-33. The LEDs will
> toggle to show the state of the switch.
>
> If you choose the toggle function, you will be asked for the second transmit and
> receive function frequencies.

2) Erase

The Erase selection deletes (erases) the function assigned to this key. The key thus becomes
undefined. You will be asked if you really want to erase this function as shown in Figure
D-34.

```
Erase key [Y]   Yes   No
```

Figure D-34. Erase Window

3) Move

The Move selection moves the function currently assigned to this key to another key
location.

4) Copy

The Copy selection copies the function currently assigned to this key to another key location.
After the message box shown in Figure D-35 appears, by moving the cursor to other keys, an
entire row or column can be copied. If the keys contain channel numbers, you will be
prompted and asked if you wish to make changes.

```
Select keys to copy by moving
the highlighted key

Press the Enter Key when you
finished selecting
```

Figure D-35. Copy Key Message Box

5) Spare

This selection assigns the highlighted key's function to one of the eight spare inputs listed in
the SPARE INPUTS menu shown in Figure D-36. Activating the spare input will cause the
function assigned to this key to be executed. Any associated LED display will remain with

this key. The spare input and associated key are effectively in parallel such that activating either one will execute the function.

```
 ━━━ SPARE INPUTS ━━━

1  Spare input 1
2  Spare input 2
3  Spare input 3
4  Spare input 4
5  Spare input 5
6  Spare input 6
7  Spare input 7
8  Spare input 8

   Selection [1]
```

Figure D-36. SPARE INPUTS Menu

B. Position Layout

Selecting Position Layout (see Figure D-3) produces the window shown in Figure D-37.

```
Panel #0 Main Upper
Panel #1 Main Lower
Panel #2 Undefined
Panel #3 Undefined

Select 2 or 3 [2]
```

Figure D-37. POSITION LAYOUT Window

Note: Panel 2 must be defined prior to panel 3.

Selecting the option "Panel #2" opens the window shown in Figure D-38.

```
A. Model 4115 Console Expander
B. Model 4015 Console Expander
C. Model 4011 Console Expander

   Select Model [C]
```

Figure D-38. Panel Selection Window

After entering A, B, or C, press ESC to enter your selection and return to the previous window, which will now show your additions.

C. Audio Controls

The menu shown in Figure D-39 allows you to set various audio parameters.

```
A. Muted Audio Level
B. Minimum Volume Level
C. Default Volume Control
D. Speaker Mute While Transmitting
E. Mute Idle Channels
F. Mute Signaling Tones
G. Mic Delay Eliminator

   Selection [ ]
```

Figure D-39. AUDIO CONTROL Menu

1) Muted Audio Level

This sets the level to which the received audio will be set when a channel is muted. The audio may be completely muted (inaudible) or set to any desired level up to 99% of full. Any number from 0 to 99 can be entered, but because the Model 4010 channel card has only eight discrete volume levels, the percentage entered will be rounded up to the nearest integer multiple of 12.5.

2) Minimum Volume Level

This sets the minimum level to which the received audio level can be set using the volume control. This will prevent a channel from being turned completely off by setting the audio to an inaudible level.

3) Default Volume Level

This allows the default volume level of all channels to be set to a predetermined level. This is the level to which all channels will be set when the "Volume Reset" key is activated.

4) Speaker Mute While Transmitting

This causes both selected and unselected speakers to be muted when transmitting. This selection should be used when a desk or gooseneck microphone is being used to prevent audio feedback from the speakers.

5) Mute Idle Channels

Use the menu shown in Figure D-40 to set mute conditions for channels that have no receive audio present.

```
A. Don't mute idle channels
B. Mute all idle channels
C. Mute unselected idle channels

Select idle channel mute  [ ]
```

Figure D-40. MUTE IDLE CHANNELS Menu

a) Don't Mute Idle Channels

This selection does not mute any idle channels.

b) Mute All Idle Channels

This selection causes all channels that have no received audio (Call activity) to be electronically muted or turned off. This is used when a system contains a large number of channels to prevent inherent channel noise from summing together and causing an annoying "hiss" on the unselected speaker.

c) Mute Unselected Idle Channels

This selection mutes only the channels that are "unselected". It has no effect on "selected" channels.

6) Mute Signaling Tones

This selection will cause the audio tones being input on the Auxiliary In port to be muted from the speakers.

7) Mic Delay Eliminator

This feature is to be used only with the optional short haul or long haul modems that can contain a voice delay option. By enabling the Delay Eliminator, the transmitter key will be held on for approximately one second after the PTT is released.

D. ANI Decode/Display

The ANI keys only have meaning if the ANI option is installed in the console. An error message will be displayed if the keys are pressed without the option. To define the operating mode or destination addresses, you must first open the ANI Decode/Display menu (see Figure D-41). To do this, select E for edit from the MAIN menu and then select P to display the next menu. Next, select D for ANI Decode / Display and the ANI menu will be displayed. The two ANI menu selections are described in the following subtopics.

```
Operating Mode
Destination

Selection [ ]
```

Figure D-41. ANI DECODE/DISPLAY Menu

1) Operating Mode

> To enable or disable ANI decoding, select Operating Mode from the ANI menu. The window shown in Figure D-42 will open.

> Select either option A or B to disable or enable ANI decoding. Select option C to configure ANI Channel Unmute operation. Select option D to configure Emergency ANI Acknowledge.

```
A. No ANI display
B. ANI display enabled
C. ANI Channel Unmute operation
D. Emergency ANI Acknowledge

     ANI Operation [C]
```

Figure D-42. ANI OPERATING MODE Menu

a) No ANI Display

Choosing this function will disable the ANI capability. Even though ANIs will be received and decoded, none will be displayed.

b) ANI Display Enabled

ANI capability is enabled and ANIs received on currently selected channel(s) will be displayed.

c) ANI Channel Unmute Operation

Selecting option C opens the window shown in Figure D-43.

```
Unmute upon receiving
ANI?   [Y] Yes No
```

Figure D-43. ANI Channel Unmute Window

d) Emergency ANI Acknowledge

Selecting option D opens the window shown in Figure D-44.

```
═══ EMERGENCY ANI ACK CHANNELS ═══

Enter Channel Number from 1 to 14

Channel Number [_]
```

Figure D-44. Emergency ANI ACK Channels Window

After entering a channel number, the window shown in Figure D-45 is displayed. Use the keyboard arrow keys to edit your selection.

```
EMERGENCY ANI ACK ENABLED?
     [N] Yes No
```

Figure D-45. Emergency ANI ACK Enable/Disable Window

After making your selection, press the ESC key to return to the CPS main menu.

2) Destination

Two addresses may be decoded by the consoles. Normally the primary address is decoded by all positions. Each position can then have its own unique secondary address allowing a mobile to call a particular operator or console.

In the window shown in Figure D-46, select the 1- to 6-digit address for primary and secondary. The timeout period is the maximum interval after a digit is received before the ANI is considered complete. For manual entry of ANI digits, the timeout might be two to three seconds with a maximum of 10 seconds.

```
Primary Address    [_____]
Secondary Address  [      ]
Timeout Period     [ 1 ]
```

Figure D-46. ANI DESTINATION Menu

Note: The destination addresses will not be displayed. Only the last six digits following the destination address will be displayed. If more than six digits follow during the timeout period, the leading digits will be dropped.

E. Display Operation

The menu shown in Figure D-47 allows the display to show the time of day in 12-hour or 24-hour format. Alternatively the display can show "------" (dashes) to prevent confusion with a master site clock.

```
A. Dashes
B. 12 Hour Time
C. 24 Hour Time

Display Operation [ ]
```

Figure D-47. DISPLAY OPERATION Menu

1) Dashes

This function causes the display to show "-------" rather than time. This would normally be used when a separate master clock is to be used for logging time.

2) 12-Hour Time

This function causes the time of day to be displayed in 12-hour format, (01-12).

3) 24-Hour Time

This function causes the time of day to be displayed in 24-hour format, (00-23).

F. Miscellaneous

Miscellaneous panel configuration functions are shown in Figure D-48.

```
A. Audio Source for 'Soft' Xmit Keys
B. Instant Select Key Display Mode
C. Received 'Call' light duration
D. Dynamic Mic selection
E. Parallel Remote Status enabled

   Selection [ ]
```

Figure D-48. MISCELLANEOUS Menu

1) Audio Source for Soft Xmit Keys

The menu shown in Figure D-49 allows you to specify the transmit audio source (Microphone) when a "soft" transmit key is activated. Refer to Table 4-2 in Section 4 of this manual for a description on microphone steering.

A "soft" transmit key is defined as a programmable panel key or spare input which has been defined as a transmit key.

```
A. Dynamic Mic (Deskmic/Gooseneck)
B. Electret Mic (Handset/Headset)
C. Spare Input #9 steered
D. Hookswitch steers 'Soft' Xmit keys & Electret PTT

   Selection [ ]
```

Figure D-49. AUDIO SOURCE FOR SOFT TRANSMIT KEYS Menu

DYNAMIC MIC (DESKMIC/GOOSENECK)

> This selection causes the Dynamic ("D" Mic) to always be the source of audio on soft key transmit. The "D" Mic is the Gooseneck or Desk mic as defined by selection "D. Dynamic Mic selection" from the MISCELLANEOUS menu (Figure D-48).

ELECTRET MIC (HANDSET/HEADSET)

> This selection causes the Electret ("E" Mic) to always be the source of audio on soft key transmit. The "E" Mic is the handset or headset mic.

SPARE INPUT #9 STEERED

> Selecting this option will allow the audio source to be "steered" by an external signal applied to Spare Input #9. See Table 4-2 in Section 4 of this manual for more information on the steering capabilities and Spare Input #9.

HOOKSWITCH STEERS 'SOFT' XMIT KEYS & ELECTRET PTT

> The hookswitch input can also be used to steer the source of transmit audio between the "D" and "E" microphones. See Table 4-2 in Section 4 of this manual for more information on the steering capabilities.

2) Instant Select Key Display Mode

The menu shown in Figure D-50 allows you to pick the mode in which to show a selected channel and/or frequency. This changes the display only; there is no operational difference.

```
A. Flashes Green LED for last selected Channel/Freq
B. Solid Green LED for selected Channel/Freq

   Selection [ ]
```

Figure D-50. INSTANT SELECT KEY DISPLAY MODE Menu

3) Received 'CALL' Light Duration

This selection allows you to set the length of time the channel "CALL" light (the red LED associated with each Select key) remains on after the received audio stops. Enter a value from zero to 60 seconds. Note that this time value is in addition to the hardware delay that is always generated by the channel card itself.

4) Dynamic Mic Selection

This feature determines the physical device assigned to the "D" Mic input. Choose either "Gooseneck" or "Desk Mic".

5) Parallel Remote Status Enabled

This feature allows two Model 4010 consoles that are interconnected through their COMB serial ports to share common tone/DC remote function status.

Parallel status is only useful in systems using multiple remote functions on one or more common channels. In this situation, changing a remote function on one Model 4010 console updates the status on the other console if the same remote function has been programmed for the same channel.

System Configuration

This section of programming allows the basic system to be defined or modified. This includes the type of control for each channel, input/output definitions, paging mode definitions, priority marker operation, transmitter timeout, and channel monitor configuration (see Figure D-51).

Prior to configuring the system, it is imperative that the programmer has a complete understanding of the radio system that is to be controlled by the Model 4010 console.

```
                     ZETRON MODEL 4010 CONSOLE PROGRAMMING SYSTEM
 Select [E]    Read  Write  drIve  New  Edit  List  Upload Program  Quit ?Help
```

```
                                  SYSTEM CONFIGURATION
                              A. Channel Configuration
                              B. Channel Monitor Configuration
                              C. Channel Paging Configuration
                              D. Paging Format Configuration
                              E. Edit Custom Calls
                              F. Input / Output Configuration
                              G. TX Timeout
                              H. Priority Marker Frequency
                              I. Priority Marker Duration
                              J. Priority Marker Interval
                              K. Priority Marker Amplitude
                              L. Custom HLGT Duration

                              Selection [A]
```

Figure D-51. SYSTEM CONFIGURATION Menu

A. Channel Configuration

Select the type of control desired for each channel that will be in the system. The types of control are: Tone, Direct Current (DC), and Local.

In the window shown in Figure D-52, enter a channel number from one to 14 or use the UP and DOWN ARROW keys to edit a previously defined channel. Channels are numbered beginning with card slot 1. System channel 1 is therefore Channel A on the dual channel card inserted in slot 1; Channel B becomes System channel 2, etc.

```
 Enter Channel Number (1-14) [   ]

 Channel Name [                 ]
```

Figure D-52. Channel Number Window

After entering the channel number, you will be prompted for a channel name. This is for reference only and may be left blank if desired.

After the name is entered, select the type of radio to be controlled or modification to be made from the menu shown in Figure D-53.

```
 A. DC Control-momentary
 B. DC Control-constant
 C. Tone Control
 D. Local (E&M) Control
 E. Delete Channel

    Selection [ ]
```

Figure D-53. CHANNEL CONFIGURATION Menu

1) DC Control-Momentary

Use this DC control option if the radio requires only a momentary DC current to perform the desired function.

2) DC Control-Constant

Some radios require that the control current be maintained constantly in order to perform the desired function. Use this option if your radio requires a constant current.

a) DC Control-Standard/Custom

After selecting momentary or constant DC control, you will be asked if your radio uses standard DC currents or if it requires custom control currents. By defining the channel as a custom control radio, the DC currents for each key must be selected from the list of available currents. Select standard or custom from the menu shown in Figure D-54.

```
Standard
Custom

Protocol [ ]
```

Figure D-54. STANDARD/CUSTOM Menu

If Standard was selected in the menu in Figure D-54, the next parameter to enter is the type of radio connected to the channel. The standard configuration choices will then be listed. Choose the one that matches your radio from the menu shown in Figure D-55.

```
A.  T1R1 STD
B.  T1R1 Paging
C.  T2R2/T22R
D.  T4R4

    Standard [ ]
```

Figure D-55. DC CONTROL STANDARD CONFIGURATION Menu

T1R1 STD

Single frequency standard DC controlled radio without paging option. Consult the radio specifications prior to selecting a channel type.

T1R1 PAGING

Single frequency standard DC controlled radio with paging option. If your radio supports the paging option, use this type. The Auxiliary PTT input will cause a DC control current different from the normal PTT to be generated.

T2R2/T22R

Standard DC controlled radio with two frequency transmit and receive capability. Choosing this option allows frequency select keys to be programmed.

T4R4

> Standard DC controlled radio with four frequency transmit and receive capability. Choosing this option allows frequency select keys to be programmed.

3) Tone Control

Two types of tone control protocol are available: Standard or Custom (see Figure D-54). Consult the radio specifications prior to selecting a channel type.

a) Tone Control Standard

If standard control tones are to be used, identify the radio being used on the current channel by choosing from the menu shown in Figure D-56. Check the radio specifications to assure the correct option is chosen.

```
A.  T1R1 Without Paging
B.  T1R1 With Paging
C.  T2R2/T22R Without PL
D.  T2R2/T22R With PL
E.  T4R4 Without PL
F.  T8R8

    Selection [ ]
```

Figure D-56. TONE CONTROL STANDARD Menu

T1R1 WITHOUT PAGING

> Single frequency standard tone controlled radio without paging option. This is the option to use if the channel is to be used without an external paging terminal.

T1R1 WITH PAGING

> Single frequency standard tone controlled radio with paging option. If your radio supports the paging option, use this type. The Auxiliary PTT input will cause a control tone different from the normal PTT to be generated.

T2R2/T22R WITHOUT PL

> Two frequency, tone controlled, remote radio without PL. Refer to Appendix A for the frequencies generated.

T2R2/T22R WITH PL

> Two frequency, standard tone controlled radio with paging option. If your radio supports the paging option, use this type. The Auxiliary PTT input will cause a control tone different from the normal PTT to be generated.

T4R4 WITHOUT PL

> Four frequency, tone controlled, remote radio without PL. Refer to Appendix A for the frequencies generated.

T8R8

> This is an eight frequency, tone controlled, remote radio. Refer to Appendix A or B for the tones required to control this type radio.

b) Tone Control Custom

Use this channel type for a tone controlled radio that does not use standard tones. A tone must be specified for each function at the time each key is assigned to this type channel using the Key edit/define menus.

4) Local (E&M) Control

A local control radio has only PTT and audio connections; it does not have control functions.

5) Delete Channel

A channel should be deleted if the channel card is to be removed from the console or if the particular channel is inoperative. This will prevent the system from reporting errors on a defective or absent channel card.

B. Channel Monitor Configuration

The Private Line Monitor control function for each channel may be defined using this menu. You will be prompted for the channel number, which must have been previously defined. The default control functions are 2050 Hz for tone remotes and -2.5 mA for DC remotes.

C. Channel Paging Configuration

The Model 4010 Console allows certain paging parameters to be defined (see Figure D-57) on a per-channel basis. These parameters are in effect only when a page is being transmitted on the channel. Other audio sources (voice, alerts, etc.) do not use any of these features. These parameters should be defined for each channel in the system on which you expect to transmit pages.

```
┌── PAGING FUNCTION ──┐      ┌─────────────────────────────┐
│ A. No Tone          │      │ Paging channel number [3 ]  │
│ B.   650 HZ         │      └─────────────────────────────┘
│ C.   750 HZ         │      ┌─────────────────────────────┐
│ D.   850 HZ         │      │ Keyup delay (0.0-10.0) [0.60]│
│ E.   950 HZ         │      └─────────────────────────────┘
│ F.  1050 HZ         │      ┌──────────────────────────────────┐
│ G.  1150 HZ         │      │ De-emphasis enabled ? [N]  Yes  No│
│ H.  1250 HZ         │      └──────────────────────────────────┘
│ I.  1350 HZ         │      ┌─────────────────────────────────┐
│ J.  1450 HZ         │      │ Inter-stack delay (0.0-10.0) [0.20]│
│ K.  1550 HZ         │      └─────────────────────────────────┘
│ L.  1650 HZ         │
│ M.  1750 HZ         │
│ N.  1850 HZ         │
│ O.  1950 HZ         │
│ P.  2050 HZ         │
│                     │
│ Tone Frequency [A]  │
└─────────────────────┘
```

Figure D-57. Channel Paging Windows

Enter the requested information in the following order:

Paging Channel Number	Enter a previously defined channel number (or select one with the Up/Down arrow keys) and press ENTER.
Keyup Delay	Enter a value from 0.0 to 10.0 seconds to set the time delay between when the channel has finished keying up the transmitter and the start of the first page in a stack.
De-emphasis enabled?	If enabled, this option will roll off the amplitude of paging tones above approximately 1200 Hz.
Inter-stack delay	Enter a value from 0.0 to 10.0 seconds to set the time delay between pages in a stack. This delay will only occur for manually entered page stacks (i.e. for 2 or more pages entered via the Paging/DTMF keypad). Since each page can be sent out over different channel(s), Instant-Call (single-button) paging stacks will always use the "Keyup Delay" between pages in stack even if the next page uses the same channel(s) as the previous page.
Paging Function	If this is a DC or Tone Control channel, select the remote function to be used for paging. To use the same remote function used for non-paging audio, select "No Tone/No Current".

D. Paging Format Configuration

This selection allows you to assign the paging format(s) to be used and to define each format's parameters (see Figure D-58). Each paging format must be assigned a unique leading digit (0-9, A, B, C, D). This allows the user to select which type of page to transmit by preceding each page with its assigned leading digit if two or more paging formats have been programmed. If only one paging format has been programmed (i.e., only one leading digit has been assigned), the page is keyed in directly and no leading digit is necessary (or allowed) since the Model 4010 already knows what type of page it will be. Note that when programming Instant Call Key paging stack(s), a leading digit is always required.

```
      ___ PAGING FORMAT LEADING DIGIT ___
     | 0. Undefined                        |
     | 1. Undefined                        |
     | 2. Undefined                        |
     | 3. Undefined                        |
     | 4. Undefined                        |
     | 5. Undefined                        |
     | 6. Undefined                        |
     | 7. Undefined                        |
     | 8. Undefined                        |
     | 9. Undefined                        |
     | A. Undefined                        |
     | B. Undefined                        |
     | C. Undefined                        |
     | D. Undefined                        |
     |                                     |
     |       Selection [0]                 |
     |_____|
```

Figure D-58. Paging Format Leading Digit Window

Enter the leading digit to assign (or select one with the UP and DOWN ARROW keys) and press ENTER. If a leading digit has already been assigned to a paging format, that format will be shown after the leading digit. You may select it to edit the format or to assign a new format to it. Or you may choose one of the "Undefined" leading digits.

The next window (shown in Figure D-59) displays all available Model 4010 paging formats. Enter the letter for the format you wish to assign to the leading digit (or select one with the UP and DOWN ARROW) and press ENTER. To "Undefine" the leading digit, select "Delete Leading Digit". Note that some paging formats are optional and will generate an error message on the Model 4010 if an attempt is made to use them without the option installed.

```
 ───── PAGING FORMATS ─────
A. 1000 Call 2 Tone
B. 100 Call 2 Tone
C. 5/6 Tone
D. Rotary Dial
E. DTMF
F. KNOX DTMF
G. Custom (PLECTRON)
H. Alerts
I. QuickCall I (2+2)

J. Delete Leading Digit

   Selection [A]
```

Figure D-59. Paging Format Window

If a paging format was selected, a sequence of windows will then be displayed to receive the page parameters unique to that selected format. Except for the "Alerts" paging format, the choices are self-explanatory and the valid input ranges are displayed for all numeric entries.

Most formats request a "Talk Time" value. When the page is finished, the audio source is switched to the microphone and the transmitter remains keyed up for the duration of the programmed talk time before going on to the next page in the stack. This talk time may be extended or canceled by pressing the "TRANSMIT" key or a PTT button. This will maintain the talk time until the key is released, even if the programmed value has not yet expired. Entering a value of zero will disable this feature for the selected paging format.

The "Alerts" paging format allows you to add various alert tones to your pages. Five Alerts and a "delay" function are provided in the Model 4010 console.

The following list shows the page character used to generate each Alert function:

> "0" = Beep Alert
>
> "1" = Slow Siren Alert
>
> "2" = Fast Siren Alert
>
> "3" = Hi/Lo Warble Alert
>
> "4" = Fast Warble Alert
>
> "D" = Delay function

For example, assuming the "Alerts" paging format has been assigned to leading digit "A", keying "A4" on the Model 4010 paging/DTMF keypad, would enter the Fast Warble alert on the paging stack. To then transmit the stacked page(s) on the selected channel(s), press the "PAGE SEND" key.

Alert tones 1 through 4 are predefined in the Model 4010 console. The Beep Alert and Delay function are defined by you via the windows shown in Figure D-60.

```
============ BEEP ALERT ============
Tone Frequency (250Hz - 3270Hz) [1000]
```

```
============ BEEP ALERT ============
ON Duration (0-6000) milliseconds [500 ]
```

```
============ BEEP ALERT ============
OFF Duration (0-6000) milliseconds [200 ]
```

```
============ BEEPS / DELAY ============
Number of beeps or Delay Time (0-9) [5]
```

```
============ ALERT DURATION ============
Alert Duration (seconds) [10.0]
```

Figure D-60. Beep Alert and Delay Function Windows

The Beep Alert consists of a sequence of beeps whose frequency, duration, and count are defined by the first four windows shown in Figure D-60.

The Delay function is used to create a delay within a paging stack during which time the Model 4010 console stops all transmission, opens the channel PTT relay, and is in the receive mode for the number of seconds specified in the fourth window shown in Figure D-60. After this time, the normal transmit mode is resumed and paging continues with the next page in the stack.

The Alert Duration window is used to specify the duration of paging alerts 1 through 4.

E. Edit Custom Calls

This selection is used to define your own custom two-tone pages (such as Plectron). Custom Calls cannot be defined until this format has been assigned a leading digit (as described above). The windows shown in Figure D-61 will be displayed after this selection.

```
Enter Custom Call # [ 11]
```

```
First Tone (250-3270 Hz) [800 ]
Duration (0-6000) Ms [1200]
```

```
Second Tone (250-3270 Hz) [1640]
Duration (0-6000) Ms [4500 ]
```

```
Gap Duration (0-6000) Ms [80 ]
```

```
Talk Time (0-30) Seconds [0_]
```

Figure D-61. Edit Custom Calls Windows

Start by entering a Custom Call number between 1 and 255 (or use the UP and DOWN ARROW keys to select a previously defined call) and press ENTER. Enter the requested frequency and duration parameters for each tone, the duration between the tones, and the talk time (described above). After the talk time has been entered, the program will return to the Custom Call number entry window. Enter a new call number to define another Custom Call or press ESC to return to the SYSTEM CONFIGURATION menu. To specify a Custom Call page, enter the leading digit followed by the desired Custom Call number.

For example, assuming the "Custom Call" paging format has been assigned to leading digit "C", keying "C11" on the Model 4010 paging/DTMF keypad would enter the custom call shown in Figure D2-55 on the paging stack. To then transmit the stacked page(s) on the selected channel(s), press the "PAGE SEND" key.

F. Input/Output Configuration

This function is used to create and name auxiliary inputs and outputs used in the console, and to set the mode of the Spare/Aux. Ports on the Model 4010 main PC board (see Figure D-62). Port numbers 1-8 are assigned to standard main PC board Spare/Aux. Ports. Port numbers 9-38 are assigned to any optional Expanded Aux. I/O Card(s) in the Model 4010 console.

```
A. Auxiliary Inputs
B. Auxiliary Outputs
C. Spare Input / Output Mode

   Selection [A]
```

Figure D-62. INPUT/OUTPUT Menu

1) Auxiliary Inputs

Up to 38 auxiliary input ports may be created and named (or modified) with this selection. Before an input port can be referenced in other areas of CPS, it must be defined. You will be prompted for input port numbers and optional associated names. Note that Input Ports 1-8 can be defined only if the main PC board Spare/Aux. Inputs (on connector P8) have been defined as "Aux-Inputs" via selection C from the menu shown in Figure D-62.

2) Auxiliary Outputs

Up to 38 auxiliary output ports may be created and named (or modified) with this selection. Before an output port can be referenced in other areas of CPS, it must be defined. You will be prompted for output port numbers and optional associated names. Note that output Ports 1-8 can be defined only if the main PC board Spare/Aux. Outputs (on connector P7) have been defined as "Aux-Outputs" via selection C from the menu shown in Figure D-62.

3) Spare Input/Output Mode

Use this selection to define the mode of the main PC board Spare/Aux. Inputs and Outputs. The next window will allow you to define the mode of each port (input and output) separately.

Enter Y and press ENTER to set the mode to "Aux". This enables the selection of auxiliary ports 1-8 in all CPS menus that request an auxiliary port number, and it disables all menu "Spare Input/Output" selection choices.

Enter N and press ENTER (this is the default) to disable auxiliary ports 1-8 and enable "Spare Input/Output" selections.

G. TX Timeout

The maximum transmitter on time is entered here. A time between one and 10 minutes may be entered. If no timeout is desired, enter zero (0).

H. Priority Marker Frequency

Enter the priority marker tone frequency in Hertz. It should be between 600 and 2000 Hz.

I. Priority Marker Duration

Enter the duration of the priority marker tone transmission. It should be between 50 and 1000 milliseconds.

J. Priority Marker Interval

Enter the time interval between priority marker tone transmissions. It should be between one and 300 seconds.

K. Priority Marker Amplitude

Enter the desired amplitude of the marker tone. It should be between one and 100 percent.

L. Custom HLGT Duration

Enter the desired High Level Guard Tone duration to be used by enabled tone channels in the system. The default duration is 120 mS. You may enter any other value from 10 mS to 630 mS in 10 mS increments. This custom duration can be enabled on a per-tone-channel basis by the option bit switch on the back of the card, as described in *Model 4010 Radio Dispatch Console Installation Manual* (Part No. 025-9227).

OTHER MENUS

The top-level menus, except for the edit menu, are described in this section.

READ

In order to edit or change an existing configuration file, it must first be read into memory using the Read function. A list of existing files on the currently selected drive and path will be displayed. Use the Up and Down arrows to select the desired file. If no files are displayed, check the current disk drive and directory using the drIve menu.

WRITE

After creating or modifying a configuration file, use this function to save it to disk. You will be prompted to name the file. You may either overwrite an existing file or create a new file.

DRIVE

The Drive function allows you to select the disk drive and directory path from which to write to or read back your configuration file(s). Use conventional DOS command syntax to specify the drive and directory path. To specify the current drive and path, enter a "." (period). Refer to your DOS manual for more information on drives and directories.

NEW

Use this function to create a new configuration file. You will be prompted for the desired name. If changes have been made to the existing file, you will be asked if you wish to save it first.

LIST

The List function will create a hardcopy printout of your console configuration on the PC printer. You will be asked whether to print the key configuration or the system configuration as described in Section 4.

UPLOAD

Use this function to transfer a previously downloaded console configuration back up to the CPS program running on your PC. All key definitions, channel configurations, and system programming that was previously downloaded (except for channel and auxiliary I/O names) will be transferred back up to the PC. It can then be modified and saved to disk or downloaded.

PROGRAM

After creating your console configuration or making changes to an existing configuration, use this function to download the configuration to the console. You will be prompted to save the file prior to programming the console. If you elect not to save the file, programming the console can still take place. For a complete discussion of this procedure, see Section 4.

QUIT

After all programming is completed, you may exit the Model 4010 CPS by selecting this function. If your changes have not been saved to disk, you will be asked if you wish to save them before leaving CPS. You may decide to discard all changes and exit without saving in which case any changes to the existing configuration file will be lost.

If you elect to save your changes, you will be prompted for the file in which you wish to store them. The highlighted file name in the displayed menu will be the configuration file that was originally loaded. To save the new configuration to this file, just press ENTER.

APPENDIX E. PAGING FORMAT REFERENCE TABLES

APPENDIX E. PAGING FORMAT REFERENCE TABLES

MOTOROLA AND G.E. TONE GROUP FREQUENCIES

Tone No.	Tone Groups						
	Mot 1	**Mot 2**	**Mot 3**	**Mot 4**	**Mot 5**	**Mot 6**	**Mot A**
0	330.5	569.1	1092.4	321.7	553.9	1122.5	358.9
1	349.0	600.9	288.5	339.6	584.8	1153.4	398.1
2	368.5	634.5	296.5	358.6	617.4	1185.2	441.6
3	389.0	669.9	304.7	378.6	651.9	1217.8	489.8
4	410.8	707.3	313.0	399.8	688.3	1251.4	543.3
5	433.7	746.8	953.7	422.1	726.8	1285.8	602.6
6	457.9	788.5	979.9	445.7	767.4	1321.2	668.3
7	483.5	832.5	1006.9	470.5	810.2	1357.6	741.3
8	510.5	879.0	1034.7	496.8	855.5	1395.0	822.2
9	539.0	928.1	1063.2	524.6	903.2	1433.4	912.0
A	none	none	none	none	none	none	1011.6
B	none	none	none	none	none	none	1122.1
Diagonal Tone	569.1	979.9	569.1	569.1	979.9	979.9	979.9

Tone No.	Tone Groups						
	Mot B	**Mot Z**	**GE A'**	**GE B'**	**GE C'**	**Mot 10**	**Mot 11**
0	371.5	346.0	682.5	652.5	667.5	1472.9	1930.2
1	412.1	384.6	592.5	607.5	712.5	1513.5	1989.0
2	457.1	426.6	757.5	787.5	772.5	1555.2	2043.8
3	507.0	473.2	802.5	832.5	817.5	1598.0	2094.5
4	562.3	524.8	847.5	877.5	862.5	1642.0	2155.6
5	623.7	582.1	892.5	922.5	907.5	1687.2	2212.2
6	691.8	645.7	937.5	967.5	952.5	1733.7	2271.7
7	767.4	716.1	547.5	517.5	532.5	1781.5	2334.6
8	851.1	794.3	727.5	562.5	577.5	1830.5	2401.0
9	944.1	881.0	637.5	697.5	622.5	1881.0	2468.2
A	1047.1	977.2	none	none	none	none	none
B	1161.4	1084.0	none	none	none	none	none
Diagonal Tone	979.9	979.9	742.5	742.5	742.5	none	none

Notes: Frequencies are shown in hertz.
"A′, B′, C′" refer to GE tone groups.

MOTOROLA AND G.E. CODE PLANS

Pager Cap-code	Code Plans								
	Mot B Groups	**Mot C Groups**	**Mot D Groups**	**Mot E Groups**	**Mot F Groups**	**Mot G Groups**	**Mot H Groups**	**Mot J Groups**	**Mot K Groups**
0xx	2+4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1xx	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
2xx	2+2	2+2	2+2	2+2	1+3	1+3	1+3	1+4	1+4
3xx	3+3	1+2	1+2	1+2	3+3	3+3	3+3	4+1	4+1
4xx	1+2	4+4	1+5	2+1	4+4	3+1	3+1	4+4	4+4
5xx	1+3	1+4	5+5	1+6	3+1	5+5	1+6	5+5	1+6
6xx	2+1	2+1	2+1	6+6	1+4	1+5	6+6	1+5	6+6
7xx	3+1	4+1	5+1	6+1	4+1	5+1	6+1	4+5	6+1
8xx	2+3	2+4	2+5	2+6	3+4	3+5	3+6	5+4	4+6
9xx	3+2	4+2	5+2	6+2	4+3	5+3	6+3	5+1	6+4
Groups	1-2-3-4	1-2-4	1-2-5	1-2-6	1-3-4	1-3-5	1-3-6	1-4-5	1-4-6

	Mot L Groups	**Mot M Groups**	**Mot N Groups**	**Mot P Groups**	**Mot Q Groups**	**Mot R Groups**	**Mot S Groups**	**Mot T Groups**	**Mot U Groups**
0xx	N/A	4+2	4+2	4+2	4+2	4+2	4+2	4+2	4+2
1xx	1+1	2+3	2+3	2+3	2+4	2+4	2+5	3+4	3+4
2xx	1+5	2+2	2+2	2+2	2+2	2+2	2+2	4+3	4+3
3xx	5+1	3+3	3+3	3+3	4+2	4+2	5+2	3+3	3+3
4xx	1+6	4+4	3+2	3+2	4+4	4+4	2+6	4+4	4+4
5xx	5+5	3+2	5+5	2+6	5+5	2+6	5+5	5+5	3+6
6xx	6+6	2+4	2+5	6+6	2+5	6+6	6+6	3+5	6+6
7xx	6+1	4+2	5+2	6+2	4+5	6+2	6+2	4+5	6+3
8xx	5+6	3+4	3+5	3+6	5+4	4+6	5+6	5+4	4+6
9xx	6+5	4+3	5+3	6+3	5+2	6+4	6+5	5+3	6+4
Groups	1-5-6	2-3-4	2-3-4-5	2-3-4-6	2-4-5	2-4-6	2-5-6	2-3-4-5	2-3-4-6

	Mot V Groups	**Mot W Groups**	**Mot Y Groups**	**Mot MT Groups**	**GE X Groups**	**GE Y Groups**	**GE Z* Groups**	**SPL EXT Groups**
0xx	4+2	4+2	N/A	4+2	A'+A'	B'+B'	A'+A'	10+10
1xx	3+5	4+6	A+A	1+1	B'+A'	C'+B'	C'+A'	11+11
2xx	5+3	6+4	B+B	2+2	B'+B'	C'+C'	C'+C'	10+11
3xx	3+3	5+6	Z+Z	1+2	A'+B'	B'+C'	A'+C'	11+10
4xx	3+6	4+4	A+B	4+4	C'+C'	N/A	N/A	3+10
5xx	5+5	5+5	A+Z	5+5	C'+A'	N/A	N/A	6+10
6xx	6+6	6+6	B+A	2+1	C'+B'	N/A	N/A	3+11
7xx	6+3	4+5	Z+A	4+5	A'+C'	N/A	N/A	6+11
8xx	5+6	5+4	B+Z	5+4	B'+C'	N/A	N/A	10+6
9xx	6+5	6+5	Z+B	2+4	N/A	N/A	N/A	11+6
Groups	2, 3, 4, 5, 6	2, 4, 5, 6	A, B, Z	1, 2, 4, 5	A', B', C'	B', C'	A', C'	3, 6, 10, 11

* GE 100-call plan Z is tone groups C'+C'; use (100-Call format). For capcodes ending in double-digits using the tone group twice (example: 122 in code plan C), use diagonal as one of the tones.

GENERAL ENCODING PLANS

Pager Cap-code	General Plan		Modified Gen. Plan		General Alternate Plan	
	Tone Groups	Diagonal Tone	Tone Groups	Diagonal Tone	Pager Capcode†	Tone Groups
0xx	4+2	N/A	N/A	N/A	0xx	N/A
1xx	1+1	569.1	1+1	569.1	1xx	953.7 + Mot 1
2xx	2+2	979.9	2+2	979.9	2xx	953.7 + Mot 2
3xx	1+2	N/A	3+3	569.1	3xx	979.9 + Mot 2
4xx	4+4	569.1	4+4	569.1	4xx	953.7 + Mot 4
5xx	5+5	979.9	5+5	979.9	5xx	953.7 + Mot 5
6xx	2+1	N/A	6+6	979.9	6xx	979.9 + Mot 1
7xx	4+5	N/A	N/A	N/A	7xx	979.9 + Mot 5
8xx	5+4	N/A	N/A	N/A	8xx	979.9 + Mot 4
9xx	2+4	N/A	N/A	N/A		
Axx*	3+3	569.1	N/A	N/A		

* The General Plan has an eleventh pager block (with Capcodes Axx), which is not coded on the console.

† For General Alternate Plan, the last two digits of the capcode are the same.

Tone Groups	
General Plan	1, 2, 3, 4, 5
Modified Gen. Plan	1, 2, 3, 4, 5, 6

Note: *On General and Modified General plans, there are different diagonal tones for different pager blocks.*

REACH ENCODING PLAN

Tone No.	Freq.	Tone No.	Freq.	Tone No.	Freq.	Tone No.	Freq.
0	3960.0	15	2354.0	30	1400.0	45	832.0
1	3824.0	16	2274.0	31	1352.0	46	804.0
2	3694.0	17	2196.0	32	1306.0	47	776.0
3	3568.0	18	2121.0	33	1261.0	48	750.0
4	3446.0	19	2049.0	34	1219.0	49	725.0
5	3329.0	20	1980.0	35	1177.0	50	700.0
6	3215.0	21	1912.0	36	1137.0	51	676.0
7	3106.0	22	1847.0	37	1098.0	52	653.0
8	3000.0	23	1784.0	38	1061.0	53	631.0
9	2898.0	24	1723.0	39	1025.0	54	609.0
10	2799.0	25	1664.0	40	990.0	55	588.0
11	2704.0	26	1608.0	41	956.0	56	568.0
12	2612.0	27	1553.0	42	923.0	57	549.0
13	2523.0	28	1500.0	43	892.0	58	530.0
14	2437.0	29	1449.0	44	862.0	59	512.0
						60	495.0

Notes: Frequencies are shown in hertz.

ZETRON TONE GROUPS FOR REACH ENCODING

Tone No.	Tone Groups				
	Z1	Z2	Z3	Z4	Z5
0	1980.0	1177.0	1400.0	832.0	588.0
1	2704.0	1608.0	1912.0	1137.0	804.0
2	2612.0	1553.0	1847.0	1098.0	776.0
3	2523.0	1500.0	1784.0	1061.0	750.0
4	2437.0	1449.0	1723.0	1025.0	725.0
5	2354.0	1400.0	1664.0	990.0	700.0
6	2274.0	1352.0	1608.0	956.0	676.0
7	2196.0	1306.0	1553.0	923.0	653.0
8	2121.0	1261.0	1500.0	892.0	631.0
9	2049.0	1219.0	1449.0	862.0	609.0

Notes: Frequencies are shown in hertz.

REACH CODE PLAN

Pager Capcode	Individual Call Tone Groups (x+y)
0yx	Z5+Z3
1xy	Z1+Z2
2yx	Z2+Z1
3xy	Z3+Z4
4yx	Z4+Z3
5xy	Z1+Z4
6yx	Z4+Z1
7xy	Z1+Z5
8yx	Z5+Z1
9xy	Z3+Z5

Note that the ones/tens digit encoding, shown by 'x' and 'y,' reverses position for each 100 pager block. In Motorola/GE plans, the first tone is always the tens digit and the second tone is the ones digit.

For REACH group call, 0xx group is not present. Instead, ten group calls are accessible using pager numbers 000, 011, 022, ... 099. These pager numbers generate the ten group call tones from tone group Z1. The group calls activate the first tone Z1 pagers (capcodes 1xx, 5xx, and 7xx).

FIVE/SIX-TONE FREQUENCIES AND TIMINGS

Tone Set	CCIR	EEA	EIA	ZVEI	DDZVEI	DZVEI	PZVEI
Tone No. 0	1981	1981	600	2400	2400	2200	2400
Tone No. 1	1124	1124	741	1060	1060	970	1060
Tone No. 2	1197	1197	882	1160	1160	1060	1160
Tone No. 3	1275	1275	1023	1270	1270	1160	1270
Tone No. 4	1358	1358	1164	1400	1400	1200	1400
Tone No. 5	1446	1446	1305	1530	1530	1400	1530
Tone No. 6	1540	1540	1446	1670	1670	1530	1670
Tone No. 7	1640	1640	1587	1830	1830	1670	1830
Tone No. 8	1747	1747	1728	2000	2000	1830	2000
Tone No. 9	1860	1860	1869	2200	2200	2000	2200
A Group	2400	1055	2151	2800	885	825	970
C X-Tone	2247	2400	2010	970	740	2800	2800
E Repeat	2110	2110	459	2600	970	2400	2600
Timing							
Preamble	673	673	673	673	673	673	673
Gap	65	65	65	65	65	65	65
Tone	100	40	33	70	70	70	70
X-Tone	100	40	65	70	70	70	70

Notes: Frequencies are shown in hertz. Timing is shown in milliseconds.

DTMF TONE PAIR FREQUENCIES AND TIMING

	Column 1	Column 2	Column 3	Column 4
First Row	1 697/1209	2 697/1336	3 697/1477	A 697/1633
Second Row	4 770/1209	5 770/1336	6 770/1477	B 770/1633
Third Row	7 852/1209	8 852/1336	9 852/1477	C 852/1633
Fourth Row	* 941/1209	0 941/1336	# 941/1477	D 941/1633

Notes: Frequencies are shown in hertz.

Key layout taken from a 16-button keypad.

Timing: Variable. Typical is 150 milliseconds of tone, 50 milliseconds of silence.
Digits: 1 through 14, including A, B, C, D, *, and #.

QUICK CALL ONE (TWO-PLUS-TWO) FREQUENCIES AND TIMING

Tone No.	A Series		B Series		Z Series	
	Freq.	Code	Freq.	Code	Freq.	Code
0	358.9	CA	371.5	CB	346.7	CZ
1	398.1	DA	412.1	DB	384.6	DZ
2	441.6	EA	457.1	EB	426.6	EZ
3	489.8	FA	507.0	FB	473.2	FZ
4	543.3	GA	562.3	GB	524.8	GZ
5	602.6	HA	623.7	HB	582.1	HZ
6	668.3	JA	691.8	JB	645.7	JZ
7	741.3	KA	767.4	KB	716.1	KZ
8	822.2	LA	851.1	LB	794.3	LZ
9	912.0	MA	944.1	MB	881.0	MZ
A	1011.6	NA	1047.1	NB	977.2	NZ
B	1122.1	PA	1161.4	PB	1084.0	PZ

Notes: Frequencies are shown in hertz.

Timing: Variable

Typical timing:
    First tone pair: 1250 ms
    Gap: 0 ms
    Second tone pair: 1000 ms
    Group call: 5000 ms (if first and second tone pairs are same)

MODEL 4010 CPS MENU STRUCTURE

READ WRITE DRIVE NEW EDIT LIST UPLOAD PROGRAM QUIT HELP

EDIT
Position Configuration
System Configuration

LIST
Key Configuration
System Configuration

NOTE

The codes at the end of the menu names refer to the items in the Appendix D Table of Contents and Edit subsection; under either Position Configuration or System Configuration.

POSITION CONFIGURATION

Key Definition (A)
Position Layout (B)
Audio Controls (C)
ANI Decode/Display (D)
Display Operation (E)
Miscellaneous (F)

SYSTEM CONFIGURATION

Channel Configuration (A)
Channel Monitor Configuration (B)
Channel Paging Configuration (C)
Paging Format Configuration (D)
Edit Custom Calls (E)
Input/Output Configuration (F)
TX Timeout (G)
Priority Marker Frequency (H)
Priority Marker Duration (I)
Priority Marker Interval (J)
Priority Marker (K)
Custom HLGT Duration (L)

KEY DEFINITION (A)

Define (A1)
Erase (A2)
Move (A3)
Copy (A4)
Spare (A5)

POSITION LAYOUT (B)

Panel #0
Panel #1
Panel #2
Panel #3

AUDIO CONTROLS (C)

Mute Audio Level (C1)
Minimum Volume Level (C2)
Default Volume Level (C3)
Speaker Mute While TX (C4)
Mute Idle Channels (C5)
Mute Signaling Tones (C6)
Mic Delay Eliminator (C7)

ANI DECODE/DISPLAY (D)

ANI Operating Mode (D1)
Destination (D2)

DISPLAY OPERATION (E)

Dashes (E1)
12 - Hour Time (E2)
24 - Hour Time (E3)

MISCELLANEOUS (F)

Audio Source for Soft Tx Keys (F1)
Instant Select Key Display Mode (F2)
Received Call Light Duration (F3)
Dynamic Mic Selection (F4)
Parallel Status Enabled (F5)

CHANNEL CONFIGURATION (A)

DC Control - Momentary (A1)
DC Control - Constant (A2)
Tone Control (A3)
Local (E&M) Control (A4)
Delete Channel (A5)

INPUT/OUTPUT CONFIGURATION (F)

Aux. Inputs (F1)
Aux. Outputs (F2)
Spare I/O Mode (F3)

DEFINE (A1)

Channel Functions (A1a)
System Functions (A1b)
Extended Channel Functions (A1c)
Auxiliary Input/Output (A1d)
Custom Channel Functions (A1e)

MUTE IDLE CHANNELS (C5)

Don't Mute Idle Channels (C5a)
Mute All Idle Channels (C5b)
Mute Unselected Idle Channels (C5c)

OPERATING MODE (D1)

No ANI Display (D1a)
ANI Display Enabled (D1b)
ANI Channel Unmute Operation (D1c)
Emergency ANI Acknowledge (D1d)

AUDIO SOURCE FOR SOFT TX KEYS (F1)

Dynamic Mic (F1a)
Electret Mic (F1b)
Spare Input (F1c)
Hookswitch Steers (F1d)

DC CONTROL (A1/2)

Standard (A1/2a)
Custom (A1/2b)

TONE CONTROL (A3)

Standard (A3a)
Custom (A3b)

CHANNEL FUNCTIONS (A1a)

Select
Frequency Select
Freq. Select w/Voting
Instant Select
Instant Select w/Voting
Instant Transmit
Volume Keys
Patch
Main/Standby
ANI Source
Site Intercom
Monitor
Phone On/Off Hook
Phone Hook Flash

SYSTEM FUNCTIONS (A1b)

Transmit Keys
Monitor
Site Intercom
Alert
Mute Keys
Simultaneous Select
Group Keys
Priority Marker
Speaker/Headset
Diagnostic Reset
Clock Set
ANI Keys
Channel Test
Phone Keys
Paging Keys

EXTENDED CHANNEL KEYS (A1c)

CTCSS Select
Repeat On/Off
Coded/Clear
Second Receiver Unmute/Mute
Wild Card I On/Off
Wild Card II On/Off

AUXILIARY INPUT/OUTPUT (A1d)

Auxiliary Input
Aux. Output Interlocked
Aux. Output Toggle
Aux. Output Momentary
Spare Output Latching
Spare Output Toggle
Spare Output Momentary

CUSTOM CHANNEL FUNCTIONS (A1e)

DC
Tone

STANDARD (A1/2a)

T1R1 Without Paging
T1R1 Paging
T2R2
T4R4

STANDARD (A3a)

T1R1 Without Paging
T1R1 Paging
T2R2/T22R Without PL
T2R2/T22R With PL
T4R4 Without PL
T8R8

VOLUME KEYS

Volume Adjust
Mute Adjust
Volume Up
Volume Down
Volume Mute

TRANSMIT KEYS

Normal Tx
Transfer Instant Tx
Patch Tx
Last Call Tx Any Channel
Last Call Tx Selected Channel
Last Call Tx Unselected Channel

ALERT

Beeps
Steady Tone
Slow Siren
Fast Siren
Warble
M25 Fast Warble

MUTE KEYS

All Mute
Mute Adjust (transfer)
Volume Adjust (transfer)
Volume REset

GROUP KEYS

Group Select
Group Instant Tx

ANI KEYS

ANI Review
ANI Select

PHONE KEYS

Phone On/Off Hook
Phone Hook Flash

PAGING KEYS

Instant Call
Page Enter
Page Clear
Page Send
Page Safety