Z E T R O N

Model 25 Programmable Encoder

Programming Guide

#025-9057G

MODEL 25 PROGRAMMING GUIDE

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WARRANTY STATEMENT

Zetron, Inc. warrants that all equipment sold pursuant to any agreement shall be free from defects in material and workmanship at the time of delivery. The warranty shall extend from the time of delivery for one year. The buyer must provide written notice of any defect to Zetron within this warranty period. If the defect is not the result of improper usage, service, maintenance, or installation and if the equipment has not been damaged or modified after delivery, Zetron shall, at its option and after the buyer has returned the equipment to Zetron, 1. replace or repair the defective part or parts of equipment, 2. replace the equipment, or 3. refund the purchase price. Shipment of the equipment to Zetron's facility shall be borne on the account of the buyer.

1. Consequential Damages: Zetron shall not be liable for any incidental or consequential damages incurred as a result of any defect in any equipment sold hereunder, and Zetron's liability is specifically limited to the obligation described herein to repair or replace a defective part or parts covered by this warranty.

2. Exclusive Warranty: The warranty set forth herein is the only warranty, oral or written, made by Zetron and is in lieu of and replaces all other warranties, expressed or implied, including the warranty of merchantability and the warranty of fitness for particular purpose.

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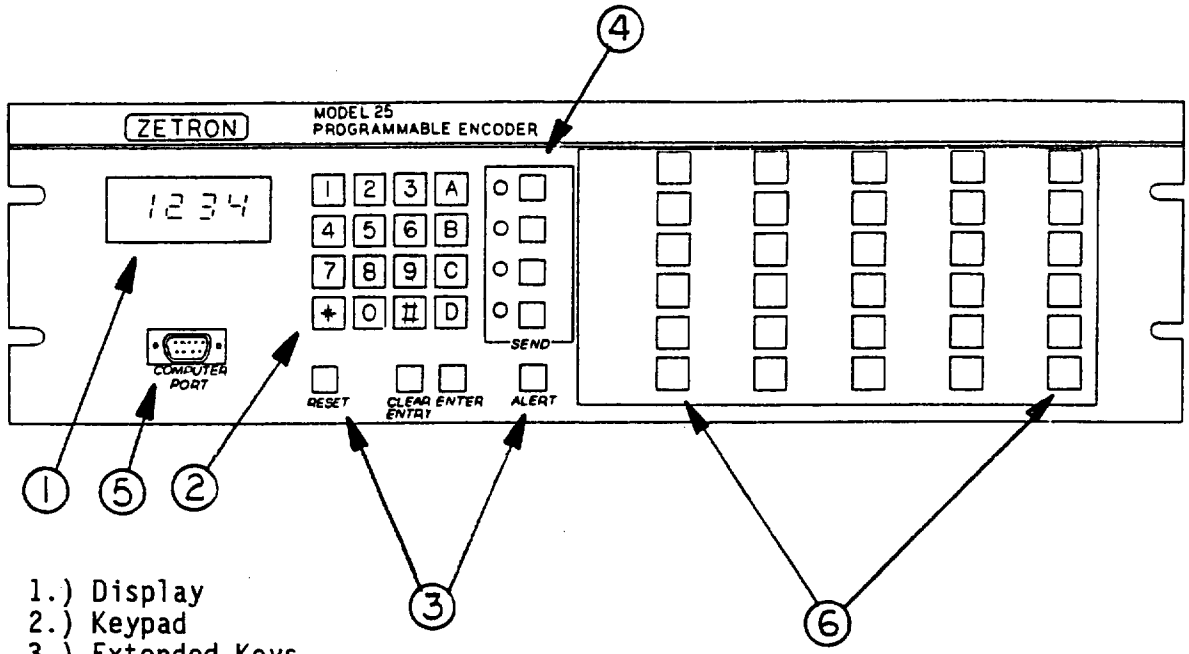
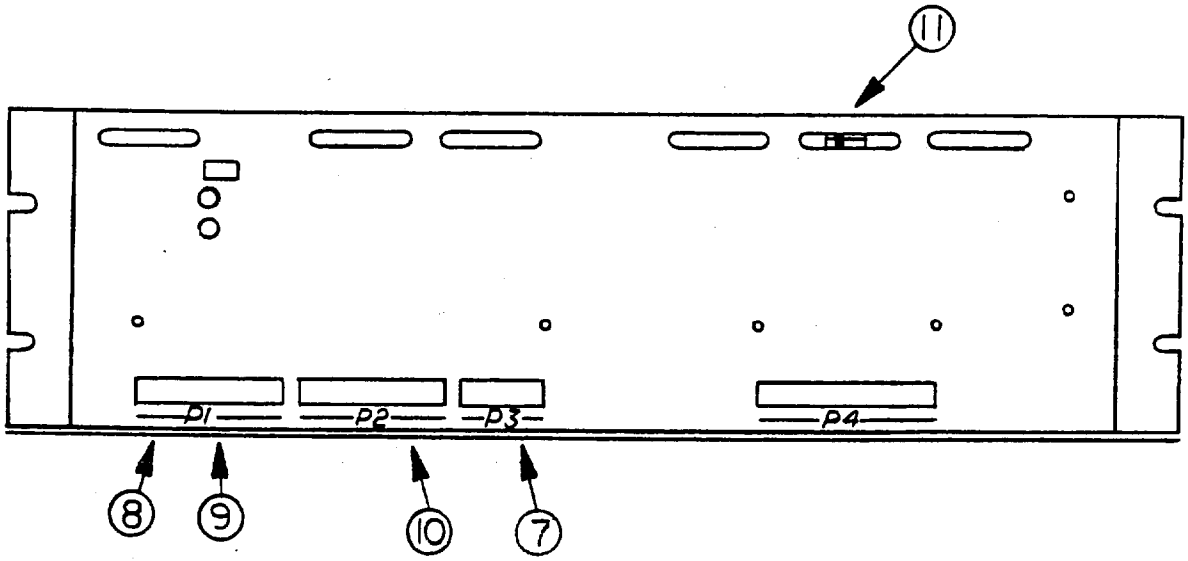
TRADEMARKS

1. FEATURES AND OPERATION

Below is a diagram of the Model 25. This section will explain the basic features and operation of the encoder.



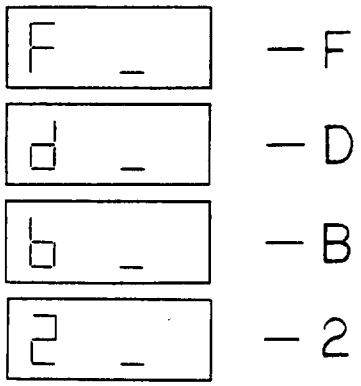
1.) Display
2.) Keypad
3.) Extended Keys
4.) SEND Buttons
5.) Computer Port
6.) INSTANT CALL Buttons



7.) Channel Busy Inputs
8.) PTT Relay
9.) Tone Relay
10.) Channel Select Relay
11.) Program "Enable/Disable" Switch

THE DISPLAY

The Model 25 is supplied with a 4-digit, 7-segment, LED display and is capable of displaying alphanumeric characters. Below are some examples of how many of the characters and prompts will appear.



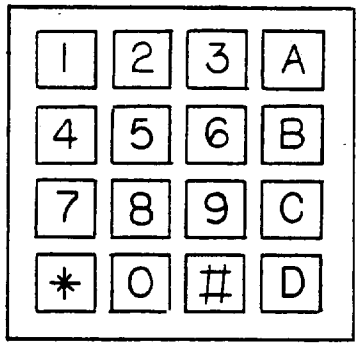
THE KEYPAD

The keypad, located on the front panel of the encoder is useful for,

1.) Programming or altering the operation of your Model 25.

2.) Manually entering any pager code available in the encoder. This feature is useful for entering seldom used codes that are not assigned to an INSTANT CALL button.

The keypad consist of keys (0 - 9, A - D, #, *).



THE EXTENDED KEYS

The Model 25 has 4 extended keys, they are:

1.) RESET
2.) CLEAR ENTRY
3.) ENTER
4.) ALERT

The extended keys provide a manual form of pager code entry. The ENTER and CLEAR ENTRY keys are provided for "Keypad Stack" operation, and the ALERT key provides a way to manually transmit an alert tone independent of any page. There is more information on the "Keypad Stack" function later in this section.

RESET Key
The RESET key resets the Model 25 from any operating condition, and returns it to the "Idle State".

CLEAR ENTRY Key
If a mistake is made while entering pager codes into the keypad stack, depression of the CLEAR ENTRY key will erase the last entry, and allow the corrected code to be entered.

ENTER Key
This key is used to "enter" pager codes into the keypad stack. First enter the pager code into the Model 25 from the keypad, then press ENTER, the code will be inserted into the keypad stack.

ALERT Key
Many times it is desirable to send an "Alert Tone" after a page. Although it is possible to accomplish this by programming an INSTANT CALL button, it is also possible to manually send one of the 4 alert tones available in the Model 25 by,

(1) Entering one digit (0 - 3) from the keypad.
    0 = Single Tone Alert
    1 = Slow Siren
    2 = Fast Siren
    3 = HI/LO Siren

(2) Press and hold the ALERT key for the duration of the desired alert.

THE KEYPAD STACK

The Model 25 is equipped with a feature called "Keypad Stack". This feature allows multiple pager codes to be entered from the keypad into a temporary holding area. Upon entry of the last pager code, the entire stack may be sequentially sent by pressing one of the SEND buttons.

Entering pager codes into the stack is accomplished by entering the pager code followed by pressing the ENTER key. If a mistake occurs while entering the pager code it may be erased and re-entered by pressing the CLEAR ENTRY key. Upon completion of entering the codes, depression of a SEND button will instruct the Model 25 to sequentially send each of the pager codes.

Operation of the Keypad Stack

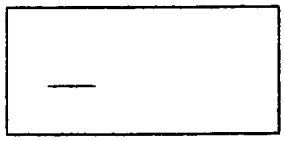
(1) Enter a pager code from the keypad.

(2) Press the ENTER key, the pager code has now been entered into the keypad stack.

(3) Enter the second pager code from the keypad.

(4) Press ENTER again, the second pager code has now been entered into the stack.

(5) Continue this procedure until all pager codes have been entered into the stack.



The far left segment of the display will "blink" this indicates that a stack has been loaded.

(6) Depression of one of the SEND buttons will instruct the Model 25 to send each pager code in the stack sequentially.

(7) Upon completion of the stack page, the Model 25 will "blink" while displaying the last pager code located in the stack. Depression of a SEND button will again send the stack. If after 20 seconds the SEND button has not been pressed, and no new paging sequence has occurred, the Model 25 will clear the stack, and return to the "Idle State".

THE SEND BUTTONS

The Model 25 is equipped with 4 SEND buttons located on the front panel. These buttons are operated in connection with the keypad for manual entry of pager codes.

When a pager code is entered at the keypad it is displayed on the LED display until one of the SEND buttons is pressed instructing the encoder to proceed with transmission.

Each of the 4 SEND buttons may be programmed to automatically select any combination of the 8 "Channel Select Relays" located on the rear panel of the encoder. These relays are responsible for the automatic selection of channels.

THE COMPUTER PORT

Located on the front panel of the encoder is a connector labeled "Computer Port". This port allows the Model 25 to be connected to a:

* CAD System
* Computer System
* CRT Terminal
* Logging Printer

This port conforms to "RS-232" EIA Specifications and may be used to:

* Configure the Model 25
* Review the settings of the Model 25
* Operate under CAD operation
* Attach a logging printer (with the optional Real Time Clock the call, day, date and time will be printed)

THE INSTANT CALL BUTTONS

The Model 25 contains 29 INSTANT CALL buttons for "one-button" paging. Each of the Instant Call Buttons may contain a single call or a group of calls from any of the formats available in the encoder. This allows multiple units or individuals to be paged, and the correct channels to be automatically selected by the press of a single button.

As many as 16 INSTANT CALL buttons may be pressed at one time, the Model 25 will send each button's pages in the order in which they were pressed.

Each INSTANT CALL button may be programmed to:

* Send a single page or group of pages containing any format assigned in the encoder.
* Automatic Channel Select of the proper channels for transmission.
* Send an "alert" tone to audibly alert personnel as to the urgency of a call.

CHANNEL BUSY INPUTS

The Model 25 is equipped with 4 "Channel Busy Inputs" located on the rear panel of the encoder. These inputs are capable of monitoring the "Busy Status" of 4 individual transmitters. When a transmitter is active or in use, the Model 25 will "hold off" sending any page until the channel is clear. If after 30 seconds of holding, the channel has not become clear, the Model 25 will "dump" the page being held.

Located on the front panel of the encoder are 4 LED indicators. These indicators will display the status of the 4 channels monitored.

Disabling the "CHANNEL BUSY INPUTS"
Monitoring of the 4 channel busy inputs may be individually "disabled" in the "GENERAL AND SEND BUTTON SETUP" Section.

THE PTT RELAY

The PTT relay is accessed on the rear panel of the encoder. The Model 25 will close this relay for the duration of the page being sent. The relay is normally connected to the consoles "AUX PTT" input, or directly connected to a remote unit or local transmitter.

THE TONE RELAY

The Model 25 is equipped with a "Tone Relay". This relay may be used in one of two ways described below.

(1) TONE RELAY - If the relay is set to operate as a tone relay, its function would be to switch or disable the microphone audio while the Model 25 is paging.

(2) SIMULSELECT - If set to this mode the tone relay will function as a "simulselect" relay and would normally control the consoles simulselect line.

CHANNEL SELECT RELAYS

The Model 25 provides 8 "Channel Select Relays" for the automatic selection of up to 8 transmitters.

Programming the "Select Relays"
Three programming sections within the Model 25 contain questions concerning the usage of the select relays, they are:

1.) TONE FORMAT SELECTION
2.) CUSTOM CALLS SETUP
3.) GENERAL AND SEND BUTTON SETUP

Each Programming Section will ask you to "select" which relays are to be used for the operation being programmed. In the case of custom calls, you will need to select which set of relays will be used for each call so that the proper channels are selected.

"RELAY" numbering
Programming the select relays is very simple:

1.) First determine which relays must be closed in order to select the proper channels.

2.) Add together the number of each relay to be closed.

3.) Enter that 3-digit number into the Model 25 when requested.

4.) If automatic channel selection is not required then "000" may be entered, this will select none of the relays.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

PROGRAM "ENABLE/DISABLE" SWITCH

The Enable/Disable switch was provided so that access to the individual "Programming Sections" could be restricted. Placing the switch into the "Disabled" position disables access to the Programming Sections from the front keypad thus eliminating the chance of alteration by "unauthorized" personnel.

The switch itself is located on the rear panel of the encoder, individuals wishing to alter the programming must have access to the rear compartment of the console. This switch also provides additional protection to the program "RAM" that holds your encoder's information and should be placed in the "disabled" position while in normal operation.

NOTE: The "enable/disable" switch must be in the "enabled" position before programming or alteration of the encoder is possible.

SUGGESTED PROGRAMMING PROCEDURE

The Model 25 may be configured in one of three ways; directly from the front keypad which requires no additional equipment, from a CRT terminal, or from a computer. Each method has its own advantages which are described below.

This manual covers the procedure for configuring the Model 25 from both the keypad and from a remote device such as a CRT or computer. In most cases the procedure and the digits entered will be the same for either method. Any differences will be described separately where appropriate.

Programming from the Keypad
Configuring the Model 25 from the keypad is quite simple, especially once the individual is familiar with the sections and operation of the Model 25. This is the quickest way to enter changes and adjustments once the Model 25 has been configured.

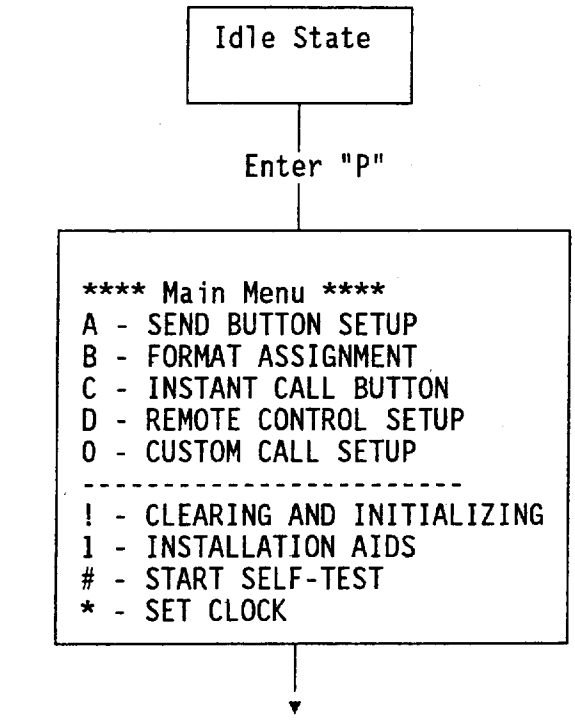
The following configuration pages will direct you through the questions in each section. The characters that will appear in the LED display for each question are shown in the box next to the question.

Programming from a CRT or Computer
Configuring the Model 25 from a CRT or computer allows the Model 25 to output "descriptive" prompts to each question and is not limited to a four-digit display. Assuming that the Model 25 is correctly connected to the "remote" CRT or computer, the "Main Menu" may be entered from the idle state by entering an upper case "P". If a lower case or incorrect character is entered, the Model 25 will "beep" indicating that an illegal character was received. Once in the "Main Menu", pressing one of the section characters will result in the Model 25 entering that programming section.

NOTE: The Model 25 "Program Enable/Disable Switch" must be in the enabled position before entering any section. Otherwise an error will occur when the Model 25 attempts to store the information.

Once in a programming section, the questions are answered the same as from the keypad. The messages that will be displayed on the terminal screen for each question are shown in the box surrounding each question, and appear in capital letters.

ENTERING THE "MAIN MENU" ON A CRT OR COMPUTER



CRT and Computer Command List

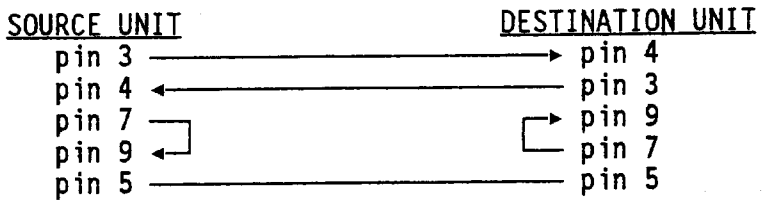
The operation of the encoder from a remote control device is nearly identical with the operation from the encoder's keypad/display with a few changes and added commands. Sending of live formats is not possible from a remote control device. Encoder action is controlled by a single ASCII character which usually has an equivalence to an encoder keypad key. When controlling the encoder remotely, the supported ASCII characters are:

CHARACTER		OPERATION
0 - 9		same as keypad 0 - 9,
A - D		same as keypad A - D,
*		same as keypad *,
#		same as keypad #,
!		same as keypad ALERT except the alert time is always 3 seconds,
LINE FEED	control-J	same as keypad ENTER,
CANCEL	control-X	same as keypad CLEAR ENTRY,
(FS)	control-\	same as keypad SEND 1,
(GS)	control-]	same as keypad SEND 2,
(RS)	control-^	same as keypad SEND 3,
(US)	control-_	same as keypad SEND 4,
BREAK for 1 second		same as keypad RESET,
RETURN	control-M	special send character,
T		print date and time,
V		print software version number,
S		print channel busy status,
P		enter Parameter Mode

Programming via another Model 25 (Downloading)
The entire programming of one Model 25 encoder may be copied into another Model 25 by directly connecting the computer ports of the two encoders. Both units must be operated in remote control mode and both units must have identical programming for their remote control parameters (preferably operating at 4800 baud, no nulls, and ignoring CTS). Once the two units have prepared, the unit that will serve as the source (which contains the programming to be copied) can start its downloading transfer to the destination unit. Downloading is started on the source unit by pressing both the RESET and ENTER keys, then releasing the RESET key. When the word "PrOG" is displayed, the ENTER key may also be released. While downloading, both units will be displaying a continuously incrementing four-digit number. Downloading will take several minutes during which the RESET key on either unit must not be pressed.

When the transfer is complete, the source unit will display the word "dOnE". If the source unit displays "FAIL", then the transfer did not transfer correctly. If this happens check the connection between the units as well as the remote control parameters. If "Err9" displays, then the RAM memory of the destination unit may be bad. If both units contain the same version of software, then nothing more is required. If the software versions differ between the two units, then the destination unit will require clearing and reprogramming of all settings except the instant call and custom call parameters. Be careful to note which unit is the source and which is the destination, otherwise both units may become cleared of any programming.

The cable connecting the two units together will plug into the computer port of both units. The cable must perform the following connections.



2. PROGRAMMING SECTIONS

INTRODUCTION

We now know that the Model 25 is capable of performing all of our signaling tasks, but how does it know which formats and timings to use and how they are to be grouped?

The Model 25 contains 6 programming sections. These sections are a group of related questions that when answered determine how the Model 25 will operate. Below is a list of the 6 sections.

1.) INITIALIZING AND CLEARING	- This section will clear individual or all sections to their factory settings.
2.) TONE FORMAT SELECTION	- Format selection and timing are assigned in this section.
3.) CUSTOM CALLS SETUP	- Special calls which include Plectron, Federal and nonstandard may be assigned.
4.) INSTANT CALL BUTTON SETUP	- Individual calls are assigned to INSTANT CALL buttons.
5.) GENERAL AND SEND BUTTON SETUP	- Setup of SEND buttons and Channel Busy inputs.
6.) REMOTE CONTROL SETUP	- Baud rate and serial port settings.

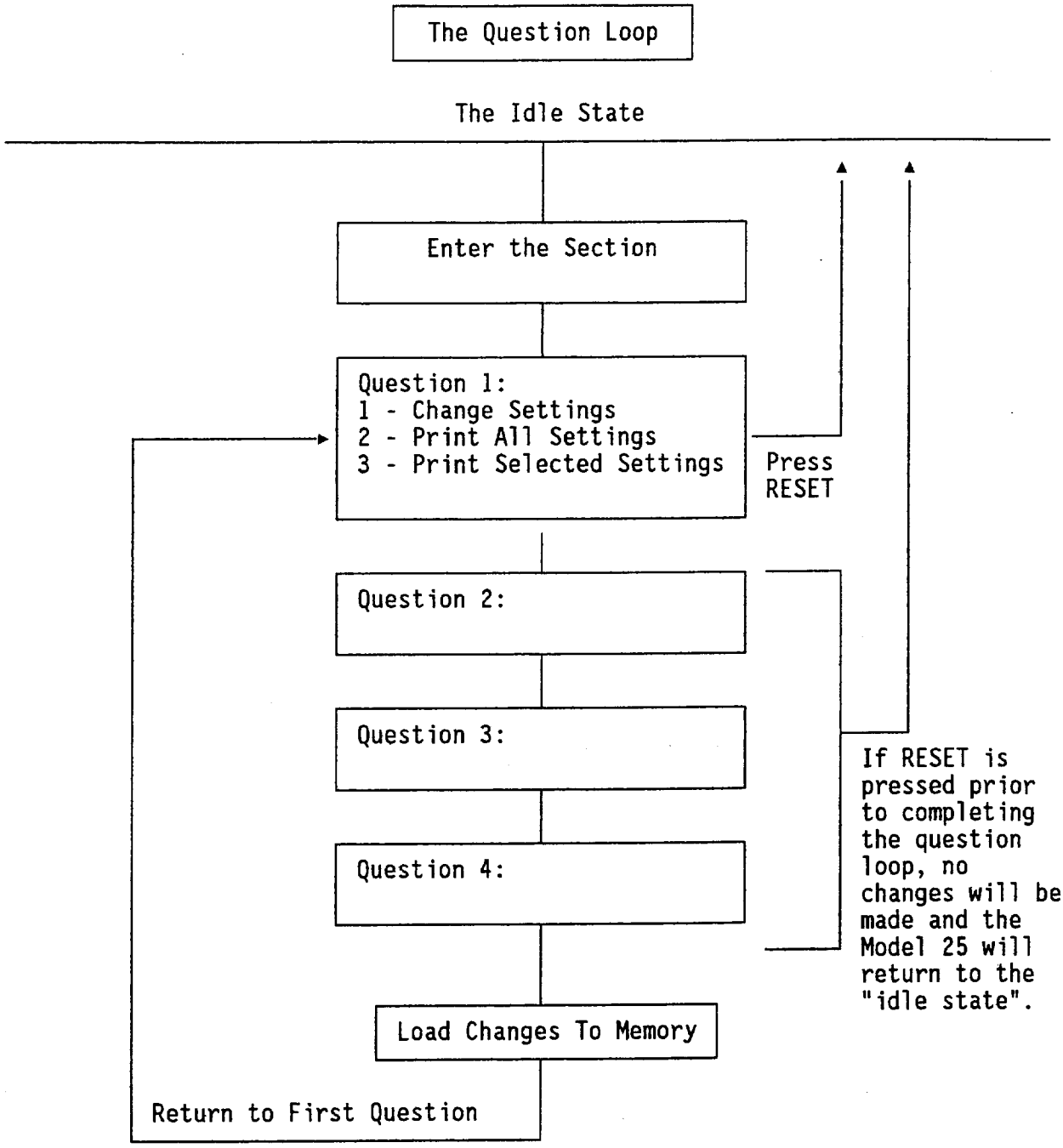
Each of the sections perform a different function in the Model 25. To make changes to the settings in a section you must first "enter" the section. From the keypad, this requires that you hold down two keys one time. This eliminates the possibility of accidentally entering a section. From a CRT, the section is entered from the main menu by selecting the section character.

Once in the section the Model 25 will prompt you for an entry to the first question. All of the questions can be answered with a 1- to 5-digit entry from the keypad.

The questions within a section form a "loop" as shown below. Once the proper number of digits have been entered for the first question the encoder will automatically continue on to the next question and again prompt you for an entry. Once the digits have been entered for the last question in the section the Model 25 will load the new information into its memory and return back to the first question where you may press RESET to return to the idle state or continue on and complete the question loop again if more than one pass through this section is required to complete the configuration of the unit (as in assigning calls to INSTANT CALL buttons in the INSTANT CALL BUTTON SETUP Section).

NOTE: If while answering a question within a section, a mistake is made, you may:

1.) Press the CLEAR ENTRY key to cancel the last digit entry. Continue on and complete the question loop again.
2.) Or press RESET which will return you to the idle state.


The Question Loop
The Idle State
Enter the Section
Question 1:
1 - Change Settings
2 - Print All Settings
3 - Print Selected Settings
Press RESET
Question 2:
Question 3:
Question 4:
If RESET is pressed prior to completing the question loop, no changes will be made and the Model 25 will return to the "idle state".
Load Changes To Memory
Return to First Question

THE IDLE STATE

To enter one of the programming sections the Model 25 must first be in the "Idle State". The idle state is when the Model 25 is not performing any operation but rather "waiting" for the press of an INSTANT CALL button, entry from the keypad, or entry from a remote CRT or computer. To insure the encoder is in the idle state press RESET or enter a <BREAK> on the remote CRT or computer. The display should appear as shown below.

If a "Real Time Clock" option has been installed, then while in the idle state the display will show the correct time instead of the dash.

IDLE STATE

NOTE: Before the Model 25 will allow entry into a programming section the "PROGRAM ENABLE/DISABLE SWITCH" located on the rear panel of the encoder must be set to the "ENABLED" position.

ENTERING A "PROGRAMMING SECTION"

While the Model 25 is in the idle state any of the 6 sections may be entered. This is done by a two-key sequence as shown below, if configuring the Model 25 from the keypad. If configuring from a CRT or computer, a "P" must be entered to display the main menu followed by the section character.

1.) PRESS and HOLD the "RESET" key.

2.) While holding the "RESET" key, PRESS and HOLD the key for the desired section.

"ALERT" - CLEARING AND INITIALIZING
"B" - FORMAT ASSIGNMENTS
"O" - CUSTOM CALL SETUP
"C" - INSTANT CALL BUTTON SETUP
"A" - GENERAL OPERATION AND SEND BUTTON SETUP
"D" - REMOTE CONTROL SETUP

3.) While still holding the section key, RELEASE the "RESET" key.

4.) Now RELEASE the section key.

The Model 25 will now prompt for the selected sections question 1.

PROGRAMMING CHART

The Programming Chart shown on the opposite page shows the sections and their question loops.

The pages that follow will explain in detail each of the sections and the questions contained within them. Read through these pages to become familiar with the response required for each question.

UNDERSTANDING PROGRAMMING SECTION QUESTIONS

1.) CLEARING AND INITIALIZING

2.) FORMAT ASSIGNMENTS

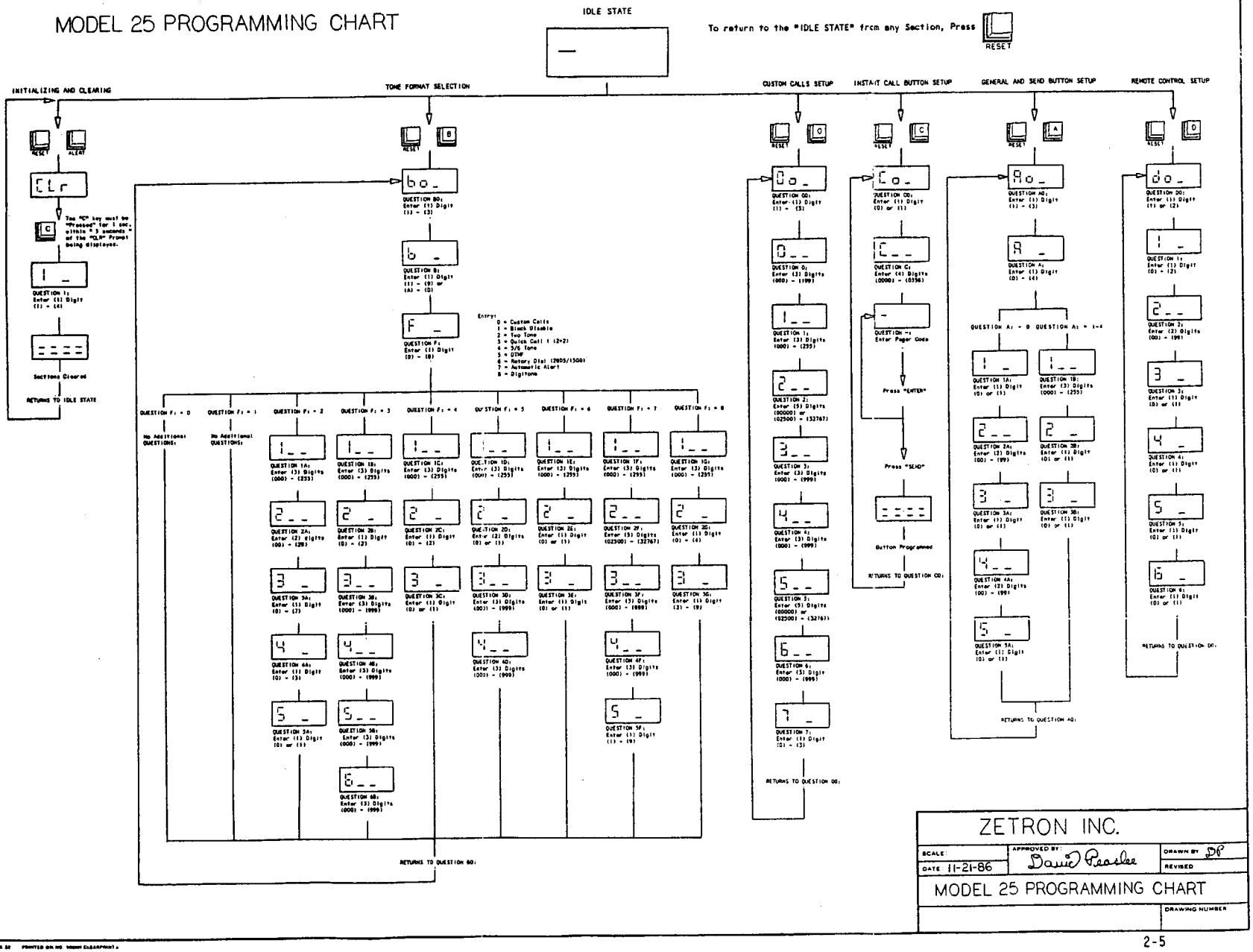
3.) CUSTOM CALLS SETUP

4.) INSTANT CALL BUTTON SETUP

5.) GENERAL OPERATION AND SEND BUTTON SETUP

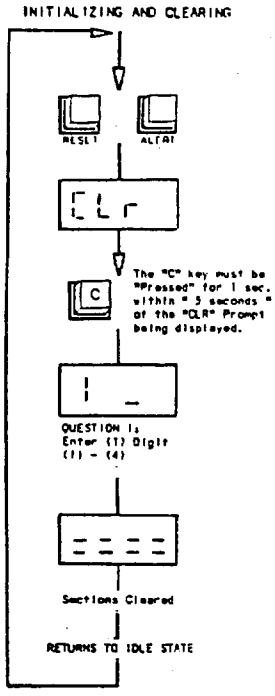
6.) REMOTE CONTROL SETUP

MODEL 25 PROGRAMMING CHART



ZETRON INC.		
SCALE:	APPROVED BY: David Peaslee	DRAWN BY DP
DATE 11-21-86		REVISED
MODEL 25 PROGRAMMING CHART		
		DRAWING NUMBER

1. CLEARING AND INITIALIZING FLOWCHART



1. CLEARING AND INITIALIZING SECTION INFORMATION

Prior to configuring the encoder for the first time it is suggested that the Model 25 be completely cleared to insure that the encoder is set to its factory settings.

```
**************************************************************************
* CAUTION: TO ENTER THIS SECTION WILL RESULT IN THE CLEARING OF ONE OR   *
*          MORE SECTIONS OF THE MODEL 25. READ THROUGH AND UNDERSTAND    *
*          THIS SECTION PRIOR TO ENTRY TO PREVENT UNINTENTIONAL CLEARING.*
**************************************************************************
```

To enter this section, from the keypad:

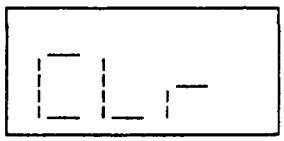
a.) PRESS and HOLD the "RESET" key.

b.) While holding the "RESET" key, PRESS and HOLD the "ALERT" key.

c.) While still holding the "ALERT" key, RELEASE the "RESET" key.

d.) Now RELEASE the "ALERT" key.

Or, to enter this section from a CRT or computer, press "!" from the main menu.



DISPLAY - "CLR" will be displayed and the Model 25 will begin to "BEEP"

e.) Now press and hold the "C" key for 1 second. On the remote, just press "C".
NOTE: The "C" key must be pressed within "5 SECONDS" of the "CLR" display otherwise the Model 25 will return to the IDLE STATE.

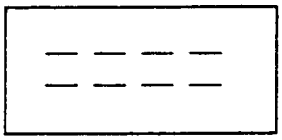
DISPLAY - The Model 25 is now in the "CLEAR" mode.

Once in the "CLEAR" mode the Model 25 will display "1 _", prompting for a 1-digit entry. Entry of a "1", "2", "3", or "4" will result in that section being cleared.

Press a "4". This will clear the entire encoder.

QUESTION 1: 1-DIGIT; 1 - 4

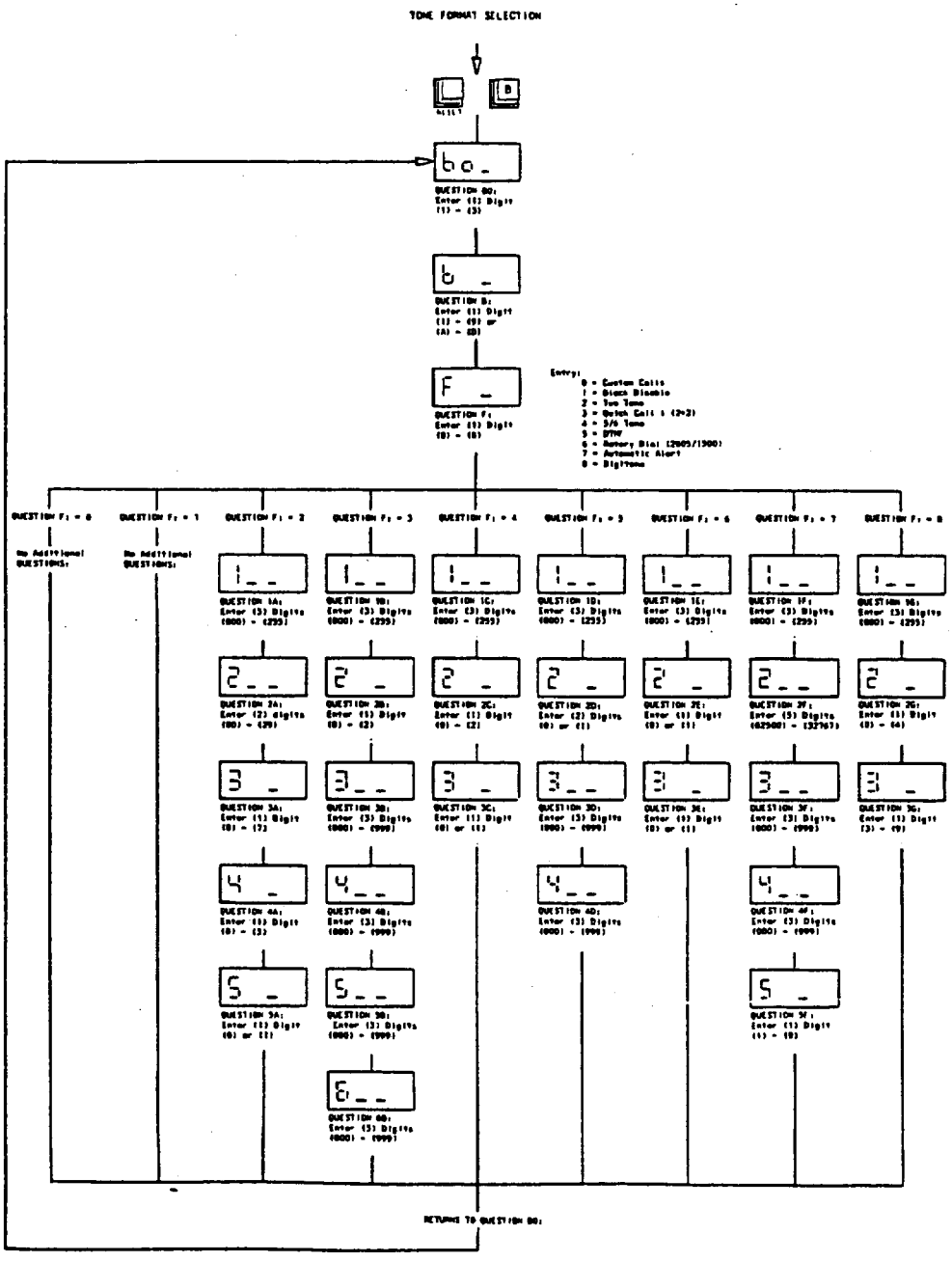
1 - CLEAR SECTIONS 2, 5, and 6
2 - CLEAR ALL INSTANT CALL BUTTONS
3 - CLEAR ALL CUSTOM CALLS
4 - CLEAR ALL SECTIONS



DISPLAY - The Model 25 is now clearing the all sections.

DISPLAY - The Model 25 will return to the "IDLE STATE".

2. TONE FORMAT SELECTION FLOWCHART



2. TONE FORMAT SELECTION INFORMATION

This section is one of the most important. This is where the various formats will be assigned. First we must "enter" the section.

To enter the TONE FORMAT SELECTION Section, from the keypad:

a.) PRESS and HOLD the "RESET" key.

b.) While still holding the "RESET" key, PRESS and HOLD the "B" key.

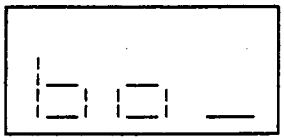
c.) While still holding the "B" key, RELEASE the "RESET" key.

d.) Now RELEASE the "B" key.

Or, from a remote CRT or computer,
enter "B" from the main menu.

This will put you into the TONE FORMAT SELECTION Section and the display will show the prompt for the first question.

TONE FORMAT SELECTION Section



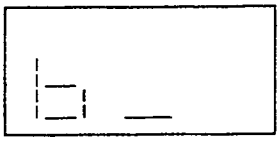
QUESTION bo: 1-Digit; 1-3

1 - CHANGE SETTINGS
2 - PRINT ALL SETTINGS
3 - PRINT SELECTED SETTINGS

1 - CHANGE SETTINGS
Entering a "1" will instruct the Model 25 to continue on to "Question: b".

2 - PRINT ALL SETTINGS
Entering a "2" will instruct the Model 25 to print the settings of all questions in this section to the printer or CRT display connected to the serial port.

3 - PRINT SELECTED SETTINGS
Entering a "3" will instruct the Model 25 to prompt for the number of the setting within this section which is to be sent to the printer or CRT display. (Information on connecting a printer to the Model 25 is located in the "Model 25 Technical Manual").



QUESTION b: 1-Digit; 1-9, A,B,C,D

LEADING DIGIT ASSIGNMENT
Enter a digit for use as a leading digit. In "Question F:" a format will be assigned to this Leading digit.

This question is very important. The operation of the encoder is based on the configuration of the leading digit. We will use the example below to demonstrate its purpose.

Let's assume your Model 25 was ordered with Motorola Two-Tone, Custom Calls, DTMF, and Motorola (2+2). As we can see below both the Motorola Two-Tone and Custom Calls require a 3-digit entry. The DTMF and Motorola (2+2) formats require a 4-digit entry. As seen in Fig. 1 there is no way to determine which calls belong to which formats, however when a leading digit is attached to the beginning of each call it is very easy to associate each call with a format. The leading digit must be either a 1 - 9 or A,B,C,D. The leading digit used for each format does not matter but may only be used once, however the same format may be assigned to a number of different leading digits. This is very useful for example if your system contains DTMF decoders that require multiple timings. The DTMF format could be assigned to as many leading digits as you have timings each leading digit would be configured to contain a different timing as shown in Fig. 2.

No "Leading Digit"

FORMATS		CALLS
Motorola Two-Tone	? ←———	1234
Custom Calls	? ←———	325
DTMF	? ←———	8945
Motorola (2+2)	? ←———	475
	? ←———	350
	? ←———	857
	? ←———	6934

After "Leading Digits" are assigned

LEADING DIGIT		FORMATS	CALLS		
1	=	Motorola Two-Tone	31234	-	DTMF
2	=	Custom Calls	1325	-	Motorola Two-Tone
3	=	DTMF	48945	-	Motorola (2+2)
4	=	Motorola (2+2)	2475	-	Custom Calls
			1350	-	Motorola Two-Tone
			2857	-	Custom Calls
			36934	-	DTMF

Figure 1.

Figure 2. below demonstrates how multiple leading digits may be used to provide the same format with different settings.

LEADING DIGIT		FORMAT	TIMING				
7	=	DTMF	1 sec.	ON	2 sec.	OFF	
8	=	DTMF	.5 sec.	ON	.5 sec.	OFF	
9	=	DTMF	3 sec.	ON	5 sec.	OFF	
A	=	DTMF	.15 sec.	ON	.15 sec.	OFF	

Figure 2.

QUESTION F: 1-Digit; 0-8

FORMAT ASSIGNMENT
Enter the number of the format that will be assigned to the "leading digit" selected in "Question b:".

0 - Custom Calls
1 - Clear the Leading Digit
2 - Two-Tone (1000-Call)
3 - Motorola (2+2) Quick Call I
4 - 5/6-Tone Sequential (Motorola)
5 - DTMF
6 - 2805/1500 Hertz Rotary Dial
7 - Alert Tone Format
8 - Digitone
9 - Golay Sequential

Here a format will be assigned to the leading digit selected in "Question b:". The Model 25 will allow only those formats ordered to be assigned to leading digits, if entry of a nonresident format is selected the Model 25 will again display the "Question F:" prompt and await the entry of a valid format number.

NOTE: The "Two-Tone Format" (format number 2) is a standard format supplied with each Model 25. Each of the other formats may be individually ordered from Zetron as an option.

Once the "Question F:" digits have been entered, the Model 25 will either load the information to its memory and return to the first question in this section (Question bo:) completing the question loop, or prompt for additional information. The additional information is required to inform the encoder of information unique to each format. The list below displays either "Return to Question bo:" which means that the format does not require additional information, or the page number where you will find the additional questions and prompts required to complete the format question loop. The "Question Loop Chart" will be helpful in identifying the various format questions.

Once the "Question F:" digits have been entered turn to selected section (found on the following pages) to answer the additional questions unique to each format.

0 - Custom Calls ..... Return to Question bo:

1 - Clear the Leading Digit ..... Return to Question bo:

2 - Two-Tone (1000-Call)

3 - Motorola (2+2) Quick Call I

4 - 5/6-Tone Sequential (Motorola)

5 - DTMF

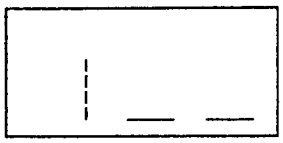
6 - 2805/1500 Hertz Rotary Dial

7 - Alert Tone Format

8 - Digitone

9 - Golay Sequential

Two-tone (1000-call)



QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

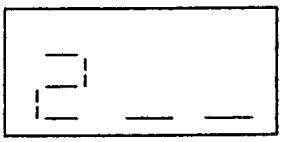
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, "ADD" the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

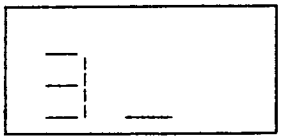


QUESTION 2: 2-Digit; 00-29

TWO-TONE CODE PLAN
The Model 25's Two-Tone format is based on the industry standard 1000-call "Code Plan". Below is a list of the Code Plans supported by the Model 25. Select one by its 2-digit number to be assigned to this leading digit.

00 = Mot B	10 = Mot M	20 = Mot Y
01 = Mot C	11 = Mot N	21 = Mot MT
02 = Mot D	12 = Mot P	22 = GE X
03 = Mot E	13 = Mot Q	23 = GE Y
04 = Mot F	14 = Mot R	24 = GE Z
05 = Mot G	15 = Mot S	25 = Reach
06 = Mot H	16 = Mot T	26 = Modified General
07 = Mot J	17 = Mot U	27 = General Alternate
08 = Mot K	18 = Mot V	28 = General
09 = Mot L	19 = Mot W	29 = Special Extended

Here we will select the Code Plan to be used for this leading digit.



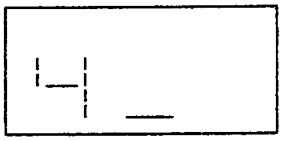
QUESTION 3: 1-Digit; 0-7

TIMING ASSIGNMENT
Enter the number of the desired Tone Timing for the format selected.

NOTE: If the REACH format was selected in "Question 2:", then the alternate REACH timings (6) and (7) will be used.

	1st Tone	Gap	2nd Tone	Group Call	Type
0 -	1.00	0.00	3.00	8.00	Mot/GE
1 -	0.40	0.00	0.80	8.00	Mot
2 -	1.00	0.00	3.00	6.00	NEC-B
3 -	1.00	0.25	3.00	6.00	NEC-A
4 -	1.00	0.00	1.00	4.00	NEC-C
5 -	0.40	0.00	0.80	4.00	NEC-M
6 -	0.50	0.00	0.50	3.00	NEC-L
7 -	0.40	0.00	0.40	3.00	NEC-D
Alternate REACH Timings 6 and 7					
6 -	0.13	0.00	0.13	1.40	REACH Fast
7 -	2.00	0.00	0.70	4.50	REACH Slow

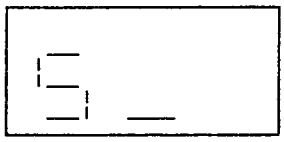
"Question 3:" will select the timing that will be assigned to the format chosen for this leading digit.



QUESTION 4: 1-Digit; 0-3

GROUP CALL OR DIAGONAL TONE
Entering a "0" will select group call, Entering a "1", "2" or "3" will select that tone as the diagonal tone.
0 - Group Call
1 - 569.1 Hz diagonal tone
2 - 979.9 Hz diagonal tone
3 - 742.5 Hz diagonal tone

"Question 4:" determines whether a diagonal tone will be used or a long tone group call.



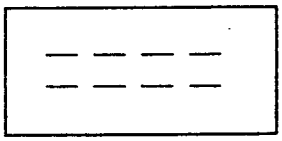
QUESTION 5: 1-Digit; 0-1

DIAGONAL TONE PLACEMENT
If group call was selected in "Question 4:" then the entry for this question has no effect, but must still be entered. If a "1", "2" or "3" was selected in "Question 4:" then entering a "0" will place the diagonal tone in the first position, and entering a "1" will place it in the second.
0 - 1st position
1 - 2nd position

In "Question 5:" the placement of the diagonal tone is selected. This entry does not affect the group call but must be entered in order to complete the question loop.

Once the digit for "Question 5:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

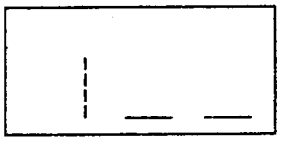
```
*******************************************************************************
* Caution: Do not remove power or press the RESET button while the            *
*          Model 25 is loading the memory, Otherwise incorrect information    *
*          could be loaded requiring reprogramming.                           *
*******************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

Motorola (2+2) Quick Call I



QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

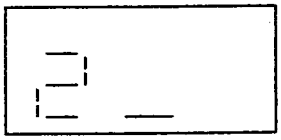
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

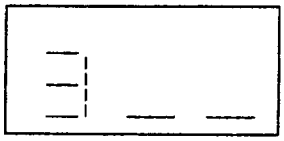
"Add" - 1 + 4 + 16 + 128 = 149



QUESTION 2: 1-Digit; 0-2

TONE GROUP SELECTION
Select which Quick Call I tone group will be assigned to this Leading Digit.
0 - "A" series
1 - "B" series
2 - "Z" series

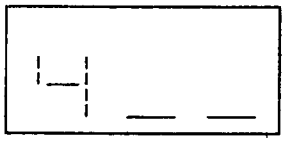
"Question 2:" allows you to select one of the standard Quick Call I tone groups "A" "B" or "Z" to be used for this leading digit. If more than one tone group is required, then more than one leading digit must be used, one for each tone group.



QUESTION 3: 3-Digit; 000-999

FIRST TONE DURATION
Enter the duration of the first tone. The Range is from 0.00 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 1.25 seconds would be entered "125"

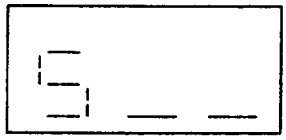
The duration of the first tone will require a 3-digit entry. This entry will not require a decimal point and any value between 0 and 9.99 seconds may be used. 1.25 seconds is standard for Quick Call I.



QUESTION 4: 3-Digit; 000-999

GAP DURATION
Enter the duration of the gap. The limits are from 0 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 0.00 seconds would be entered "000"

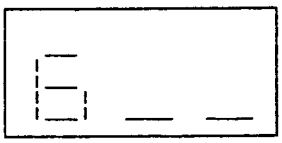
The gap duration is the time between the first and second tones. This time is normally 0.00 seconds.



QUESTION 5: 3-Digit; 000-999

SECOND TONE DURATION
Enter the duration of the second tone. The limits are from 0 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 1.00 seconds would be entered "100"

The duration of the second tone will require a 3-digit entry. This entry will not require a decimal point and any value between 0 and 9.99 seconds may be used. 1.00 seconds is standard for Quick Call I.



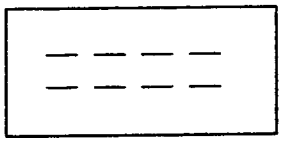
QUESTION 6: 3-Digit; 000-999

GROUP CALL DURATION
Enter the duration of the group call. The limits are from 0 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 5.00 seconds would be entered as "500"

Here the group call duration is selected. The normal duration of the group call in Quick Call I is 5.00 seconds.

Once the digits for "Question 6:" have been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

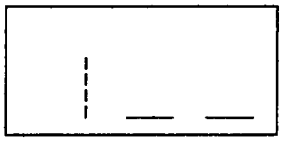
```
**********************************************************************
* Caution: Do not remove power or press the RESET button while the   *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                  *
**********************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

Motorola 5/6-tone Sequential



QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

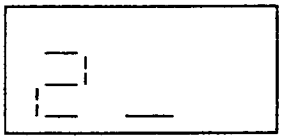
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

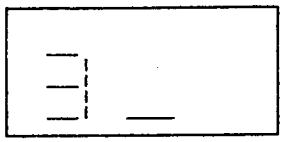
"Add" - 1 + 4 + 16 + 128 = 149



QUESTION 2: 1-Digit; 0-2

TONE GROUP
Enter the number of the tone group which contains the proper tone set.
0 - EIA (Normal setting for USA)
1 - CCIR
2 - ZVEI

3 tones groups exist in Motorola's 5/6-tone format. The EIA series is the most common in the USA.



QUESTION 3: 1-Digit; 0-1

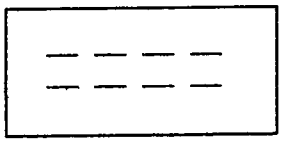
ADDRESS TYPE
Select the operation of the 5/6-tone format, single or dual address.

0 - Single Address operation
1 - Dual Address operation

Most 5/6 pagers are capable of the dual address function, however the encoder is the device that determines whether the dual function is used. The second "address" must be sent by the encoder in order for the pagers to react to it. The Model 25 is capable of single or dual address operation as set in "Question 3:".

Once the digit for "Question 3:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
*****************************************************************************
* Caution: Do not remove power or press the RESET button while the          *
*          Model 25 is loading the memory. Otherwise incorrect information  *
*          could be loaded requiring reprogramming.                         *
*****************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

DTMF Format

QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

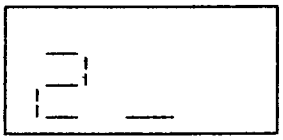
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

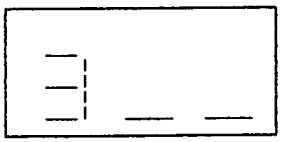


QUESTION 2: 1-Digit; 0-1

DTMF LIVE OR PRESET
If "preset" is selected the DTMF digits that are to be transmitted will be sent automatically by pressing the INSTANT CALL button containing the call.
If "Live" is selected then the encoder will enter the "Live" mode following the last pre-programmed digit sent, allowing manual entry of additional DTMF digits.

0 - Preset DTMF
1 - Live DTMF

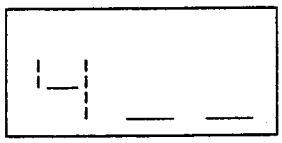
This feature allows a DTMF set of digits to be assigned to an INSTANT CALL button where they will be automatically transmitted when that button is pressed. If "Question 2:" is set to "Live", the encoder will enter the "live" mode after all of the preprogrammed digits have been sent. This allows additional DTMF digits to be manually sent directly from the keypad. The manual digits will be sent as long as the button is depressed. If the "live" mode is selected but no preprogrammed digits are desired, then the encoder may be programmed to go directly to the "live" mode by storing the leading digit only into the Instant Call stack.



QUESTION 3: 3-Digits; 000-999

"ON" DURATION
Enter the "ON" time of the DTMF tone. The range is 0.00 seconds to 9.99 seconds.
Example: 1.50 seconds would be entered as "150".

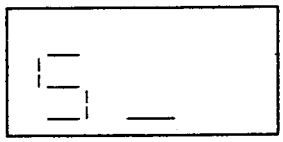
Set the "ON" time of the preprogrammed DTMF digits assigned to this leading digit.



QUESTION 4: 3-Digits; 000-999

"OFF" DURATION
Enter the "OFF" time of the DTMF tone. The range is 0.00 seconds to 9.99 seconds.
Example: 1.50 seconds would be entered as "150".

Set the "OFF" time of the preprogrammed DTMF digits assigned to this leading digit.



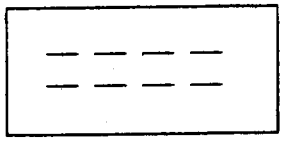
QUESTION 5: 1-Digit; 0-1

TONE SELECTION
Select either standard DTMF tone generation or Knox DTMF tones.

0 = Standard DTMF
1 = Knox DTMF

Once the digit for "Question 5:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
**************************************************************************
* Caution: Do not remove power or press the RESET button while the       *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                      *
**************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

2805/1500 Hertz Rotary Dial Format

QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

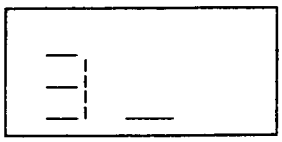
EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

QUESTION 2: 1-Digit; 0-1

2805/1500 HERTZ, LIVE OR PRESET
If "preset" is selected the 2805/1500Hz digits that are to be transmitted will be sent automatically by pressing the INSTANT CALL button containing the call.
If "Live" is selected then only the 2805/1500Hz leading digit will be assigned to an INSTANT CALL button and the digits will be entered "Live" from the keypad once the instant call button is pressed.
0 - Preset 2805/1500Hz
1 - Live 2805/1500Hz

This feature allows a DTMF set of digits to be assigned to an INSTANT CALL button where they will be automatically transmitted when that button is pressed. If "Question 2:" is set to "Live" then the DTMF format will be assigned to an INSTANT CALL button without digits. Pressing that INSTANT CALL button will instruct the Model 25 to key up and then allow the DTMF digits to be entered from the keypad where they will be transmitted immediately "Live".



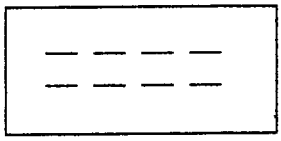
QUESTION 3: 1-Digit; 0-1

TONE SELECTION
Two standard tone frequencies are selectable for the Rotary Dial Format.
0 - 2805 Hertz
1 - 1500 Hertz

Two standard frequencies exist for the rotary dial format, they are: 2805 Hertz and 1500 Hertz. Selection of one will result in that frequency being used for this leading digit. If both 2805 and 1500 Hertz must be used then each must be assigned to it own leading digit.

Once the digit for "Question 3:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
*****************************************************************************
* Caution: Do not remove power or press the RESET button while the          *
*          Model 25 is loading the memory. Otherwise incorrect information  *
*          could be loaded requiring reprogramming.                         *
*****************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

Alert Tone Format
The "Alert Tone Format" provides a means for adding various alert tones to your calls. Four alerts are provided and are handled the same as the various formats. Once the alert tone format is assigned to a leading digit it is possible to assign it to an INSTANT CALL button the same as any format call, or it may be manually entered from the keypad.

One other feature provided by the alert tone format is the ability to create a "delay" within the INSTANT CALL button stack. During the delay the PTT (Push-to-talk) relay will open and the result is a delay without activity.

Question 5: performs two functions:

1.) It determines how many "beeps" will be produced when the beep alert is used.
2.) It determines the number of seconds of "delay" the encoder will wait when the delay function is used.

Therefore if the "beep" alert (Alert 0) is set to produce 5 beeps, then when the "delay" function (Alert D) is used 5 seconds of delay will be produced.

As in all formats the alert tone format may be assigned to more than one leading digit to allow a number of different beep alerts and delays to be generated.

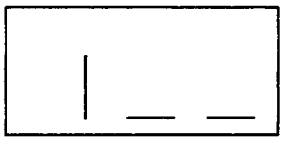
One or all of the alerts may be used. As in all format calls the first digit entered either manually from the keypad or while programming an instant call stack is the leading digit, followed by a "0" for the beeps alert (as configured below in Questions 1 - 5), a "1" for "SLOW SIREN" alert, a "2" for "FAST SIREN" alert, a "3" for "HI/LO WARBLE" alert, or a "D" for "DELAY".

ALERT FORMAT

LEADING DIGIT (Followed by a)	"0"	=	BEEPS ALERT
	"1"	=	SLOW SIREN ALERT
	"2"	=	FAST SIREN ALERT
	"3"	=	HI/LO WARBLE ALERT
	"4"	=	RAMP ALERT
	"D"	=	DELAY (based on number of Beeps assigned in Question 5:)

Example: In this example we will assume that the alert tone format was assigned to leading digit "A" (any unused leading digit may be used).

To assign a "beep" alert to an INSTANT CALL button, enter an "A0". Enter an "A1" for "SLOW SIREN, "A2" for "FAST SIREN", "A3" for "HI/LO WARBLE", "A4" for "RAMP ALERT", or "AD" for "DELAY".



QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

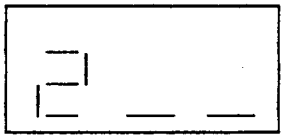
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

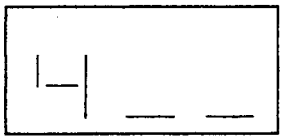


QUESTION 2: 5-Digit; 02500-32767

BEEP TONE FREQUENCY
Select the frequency of the beep tone alert. This entry determines the frequency of the beep alert and has no effect on the other alerts, however must be entered in order to complete the question loop.
The range is 250.0 Hertz to 3276.7 Hertz. 5 digits must be entered, 330.5 Hertz would be entered as "03305".

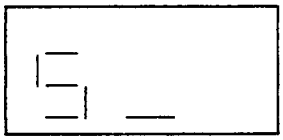
QUESTION 3: 3-Digit; 000-999

BEEP "ON" TIME
Enter 3 digits which determine the "ON" time of each BEEP. The range is 0.00 seconds to 9.99 seconds.
Example: 0.50 seconds would be entered as "050".



QUESTION 4: 3-Digit; 000-999

BEEP "OFF" TIME
Enter 3 digits which determine the "OFF" time of each BEEP. The range is 0.00 seconds to 9.99 seconds.
Example: 0.50 seconds would be entered as "050".



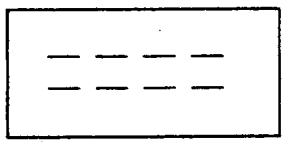
QUESTION 5: 1-Digit; 1-9

NUMBER OF BEEPS/DELAY TIME
Enter the number beeps to be issued when the "Beep" alert is selected. The number of beeps selected will also be the number of seconds of "Delay" when the delay function is selected.

"Question 5:" determines the number of beeps to be produced by the Model 25 when the beep alert is selected. The number of beeps selected will also be the number of seconds of delay that will be produced when the delay function is used. The delay function may be embedded anywhere in the INSTANT CALL button stack the same as any format call and is useful for suspending operation for the delay period.

Once the digit for "Question 5:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
**************************************************************************
* Caution: Do not remove power or press the RESET button while the       *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                      *
**************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

Digitone Format

QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

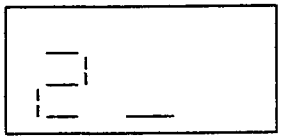
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149



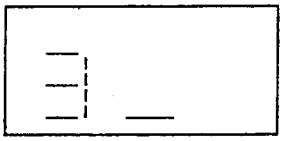
QUESTION 2: 1-Digit; 0-4

LEADING ZEROS
The Digitone format consists of 5 digits. Leading zeros may be strapped or preset eliminating the need to enter them.

Example: Lets assume that the system contains Digitone codes:

00019
00020
00021
00022

The leading zeros may be strapped so that only the last two digits are required to be entered. Therefore the code "00019" would be entered as "19".

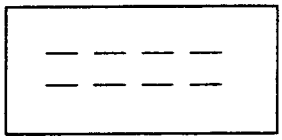


QUESTION 3: 1-Digit; 3-9

NUMBER OF REPEATS
Enter the number times the code is to be repeated (normally 4 times).

Once the digit for "Question 3:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
**********************************************************************
* Caution: Do not remove power or press the RESET button while the   *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                  *
**********************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION bo:".

Golay Format

The Zetron Model 25 Programmable Encoder supports signaling of Golay pagers according to Motorola function plan A. The available types of signaling are: tone, voice and numeric data. Alphanumeric data is not supported by the Model 25.

KEYPAD OPERATION - Via the keypad, all three types of signaling are available: tone, voice and numeric data.

Operation from the keypad can be broken down into two sections; the cap-code entry cycle, and the message entry cycle. The two cycles are easily distinguished by looking at the display window. The display shows dashes "-" the encoder is in the cap-code entry cycle. When the display shows underlines "_" the encoder is in the message entry cycle.

After the encoder has completed its power-on self test and after every press of the RESET button, the encoder will be in the cap-code entry cycle.

All keypad paging must begin with the entry of the block or leading digit. Since the encoder has multiple format capability, the leading digit is used to select the proper block of format.

Following the block digit must be the actual pager cap-code. This may range from one to six digits in length depending on the programming of the block's leading zero strapping.

Following the pager cap-code must be one function code digit. The function code is used to instruct the encoder and the pager as to the type of page signal that will be sent; either tone, voice or numeric data. The following table shows the use of the function digit:

Function Digit	Type of Page Sent
1-4	voice
5-8	data
9,0	tone

While entering the block, cap-code and function in the cap-code entry cycle, the encoder will be maintaining a 30 second timer. Each time a key is entered the timer is reset. If the timer reaches its 30 second limit, the display will clear requiring the information to be re-entered.

After entry of the function code a SEND key must be pressed. If the function code indicates a numeric data message type of page, then the encoder starts the message-entry cycle indicated by the four underlines "____" in the display. At this prompt, the numeric message may be entered, up to 12 digits in length. In addition to numbers 0-9, special characters may also be entered using the "ABCD*#" keys of the keypad. The following table shows the special characters available.

Keypad Key	Pager Message Character Displayed
A	≡ (3 horizontal bars)
B	E
C	U
D	space
#	space
*	- (hyphen)

After message entry, the SEND key is again pressed to send the page with the message. Or if the page is not a message type, then the page will be sent when the SEND key is first pressed.

NOTE: the only way to exit the message-entry cycle is to press RESET or to properly complete the message and press the SEND key. Improper messages are not allowed to be sent and will cause an error beep if sending is attempted. When an error occurs, the improper message will be cleared and the message prompt ("____") will again appear.

When transmission to the pager begins, the display will briefly show "SEnd" followed by the last four digits of the cap-code/function being sent. If the function sent indicates that this is a voice page, then the encoder will display the word "tALH" (talk) when the pager's speaker has been unsquelched. If properly installed, the encoder will extend the talk period while the microphone PTT switch is depressed. When the talk period is being extended, the encoder will display "bUSY". The talk period is required since the encoder must again transmit to the pager to squelch the pager's speaker.

Keypad stacking of cap-codes is allowed as long as the pager function is not a numeric data message type. If voice pages are stacked, you will not be prompted to talk ("tALH") unless the last page in the stack is a voice page. The voice message then would go to all voice pagers signaled using the stack. This same restriction applies to stacking for Instant Call, single button paging.

Keypad Entry Review:

```
"----"          display prompt indicates cap-code entry mode
"____"          display prompt indicates data message entry mode
b xxxxxx f      Golay sequence to be entered at cap-code prompt
     b      = leading block digit (0-9, A, B, C, D)
     xxxxxx = one to six digit cap-code using characters 0-9 only
     f      = function digit using characters 0-9 only
```

PROGRAMMING - When the Golay format is programmed for a particular block, the following block/format parameters must be entered.

4.j Golay (GSC) Format

For format type 9, 3 additional parameters must be entered.

PROMPT	REQUIRED RESPONSE
1 or CHANNEL SELECT RELAYS (000-255)	Three digits: 000 - 255 Enter the summed value of the control relays to be used when calls using this block are sent via an Instant Call key.
2 or LEADING ZEROS (0-5)	One digit: 0 - 5 Enter the number of leading zeros. Leading digits in the block's cap-code may be fixed to zero and thus eliminate the number of digits entered on the keypad during paging or programming.
3 or TALK TIME (00-59 S)	Two digits : 00 - 59 Enter the desired talk time period in one second quanta. This talk time is used only when pages from this block have a voice-type of page function. During the talk time the encoder will automatically allow the microphone to operate. After the talk time the encoder will either turn off the mic or extend the talk time depending on proper installation and operator action. Range: 00 - 59 seconds. Example: 05 = 5 seconds of talk time.

INSTALLATION

WIRING TO THE TALK TIME EXTENDER

The talk time period of Golay pages may be extended by attaching a switch between GROUND and CHANNEL BUSY 4. These connections may be found on connector P3 on the encoder's rear panel. While the encoder is in its "talk" cycle (display shows "tALH"), the talk period is extended by closing the switch, thus shoring CHANNEL BUSY 4 to GROUND. While the talk period is being extended, the encoder will display the word "bUSY". The encoder will extend the talk period until the switch is opened, thus removing the short.

DIGITAL TRANSMITTER CONTROL

Unlike regular tone paging, digital paging (such as Golay paging) makes use of binary digital data. Digital paging thus requires special transmitters with direct DC coupling to accomplish RF carrier shifting from the binary digital data sent to it.

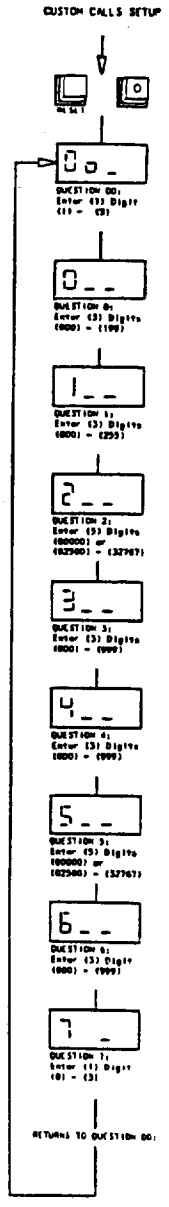
Two signals are used to control digital paging: the DIGITAL DATA OUTPUT and the DIGITAL MODE OUTPUT. The DIGITAL MODE OUTPUT signal, at P4-7, is used by external equipment, such as modems or transmitters, to distinguish between analog/tone pages and binary digital pages. This output from the Model 25 is RS-232 compatible, and presents a voltage level between -3 and -12 VDC when sending analog tone or voice. This output presents a voltage level between +3 and +12 VDC when sending binary digital data.

The DIGITAL DATA OUTPUT signal, at P4-5, feeds the binary digital paging information to modems or transmitters. This output from the Model 25 is RS-232 compatible, and presents a voltage level between -3 and -12 VDC for binary low (0) levels, and a voltage level between +3 and +12 VDC for binary high (1) levels. The polarity of the DIGITAL DATA OUTPUT can be selected using jumper JP1 on the digital board (702-9022) inside the encoder. For normal data polarity, JP1 should be in the "B" position. For reverse data polarity, JP1 should be in the "A" position.

DISPLAY SCROLL ENABLE/DISABLE

The display of the encoder always operates with scrolling disabled. Jumper JP1 is now used to select digital data output polarity.

3. CUSTOM CALL SETUP FLOWCHART



3. CUSTOM CALL SETUP INFORMATION

The Custom Calls Format allows the Model 25 to signal Plectron, Federal, and most nonstandard two-tone calls by allowing you to individually enter the frequencies and timing information for each call. Up to 200 custom calls may be entered and once configured may be used as many times as required.

While configuring each call the Model 25 will prompt you to assign a 3-digit number to each call. This number allows you to identify each call and provides a way to enter the calls into INSTANT CALL buttons.

Any number between 000 and 199 may be used as the call number but must only be used once. If the question loop is completed a second time for a call number that has already been configured, the old information for that call number will be lost, and the call will now contain the new information.

Single Tone Calls
The custom calls format allows single tone calls to be signaled. To accomplish this the first tone frequency (Question 2:) must be set to the desired single tone frequency and the first tone duration (Question 3:) must be set to the total desired tone duration. The gap duration (Question 4:) must be set to "000", the second tone frequency (Question 5:) must be set to "00000", and the second tone duration (Question 6:) must be set to "000". The alert tone (Question 7:) is still optional.

EXAMPLE: Transmit a single tone of 901.1 Hertz for 5.00 seconds.

1st Tone	1st Duration	Gap	2nd Tone	2nd Duration	Alert
"09012" (901.1 Hz)	"500" (5.00 sec.)	"000" (0 sec.)	"00000" (0 sec.)	"000" (0 sec.)	"0" (no alert)

To enter the CUSTOM CALL SETUP Section, from the keypad:

a.) PRESS and HOLD the "RESET" key.

b.) While still holding the "RESET key, PRESS and HOLD the "0" key.

c.) While still holding the "0" key, RELEASE the "RESET" key.

d.) Now RELEASE the "0" key.

Or, from a remote CRT or computer,
enter "0" from the main menu.

This will put you into the CUSTOM CALL SETUP Section and the display will show the prompt for the first question.

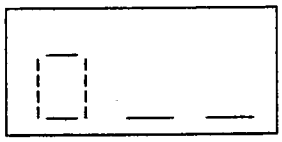
QUESTION 0o: 1-Digit; 1-4

1 - CHANGE SETTINGS
2 - PRINT ALL SETTINGS
3 - PRINT SELECTED SETTINGS

1 - CHANGE SETTINGS
Entering a "1" will instruct the Model 25 to continue on to "Question: 0".

2 - PRINT ALL SETTINGS
Entering a "2" will instruct the Model 25 to print the settings of all questions in this section to the printer or CRT display connected to the serial port.

3 - PRINT SELECTED SETTINGS
Entering a "3" will instruct the Model 25 to prompt for the number of the setting within this section which is to be sent to the printer or CRT display. (Information on connecting a printer to the Model 25 is located in the "Model 25 Technical Manual").



QUESTION 0: 3-Digit; 000-199

CALL NUMBER ASSIGNMENT
Select a 3-digit call number to be assigned to the following custom call. The number must be in the range from 000 to 199.

The "custom call" question loop must be completed for each custom call to be configured. "Question 0:" will ask you to assign a "Call Number" to each call, this allows you to identify the call and will be used to assign the call to a INSTANT CALL button or for entry from the keypad.

QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

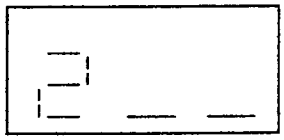
The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call from this leading digit is to be sent by the Model 25. The diagram below will assist you in determining the number required for the relay selection desired.

Relay 1	Relay 2	Relay 3	Relay 4	Relay 5	Relay 6	Relay 7	Relay 8
1	2	4	8	16	32	64	128

To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

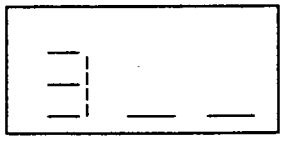
"Add" - 1 + 4 + 16 + 128 = 149



QUESTION 2: 5-Digit; 02500-32767

FIRST TONE FREQUENCY
Enter the frequency of the first tone. The range is 250.0 Hertz to 3276.7 Hertz. 5 digits must be entered.
"00000" may be entered, the result is no tone sent, this feature is useful for configuring single tone calls.
Example: 330.5 Hertz would be entered as "03305".

Enter the first frequency of the call. The entry must be made with all 5 digits as shown in the example. The digits "00000" may be entered and provides the ability to enter single tone calls.



QUESTION 3: 3-Digit; 000-999

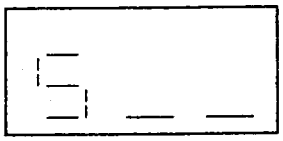
FIRST TONE DURATION
Enter the duration of the first tone. The range is from 0.00 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 1.25 seconds would be entered "125"

The duration of the first tone will require a 3-digit entry. This entry will not require a decimal point and any value between 0.00 and 9.99 seconds may be used.

QUESTION 4: 3-Digit; 000-999

GAP DURATION
Enter the duration of the gap. The range is from 0.00 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 0.00 seconds would be entered "000"

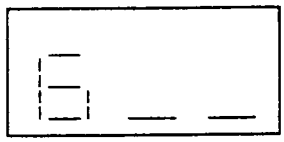
The gap duration is the time between the first and second tones. This time is normally 0.00 seconds.



QUESTION 5: 5-Digit; 02500-32767

SECOND TONE FREQUENCY
Enter the frequency of the second tone. The range is 250.0 Hertz to 3276.7 Hertz. 5 digits must be entered.
"00000" may be entered, the result is no tone sent, this feature is useful for configuring single tone calls.
Example: 330.5 Hertz would be entered as "03305".

Enter the first frequency of the call. The entry must be made with all 5 digits as shown in the example. The digits "00000" may be entered and provides the ability to enter single tone calls.



QUESTION 6: 3-Digit; 000-999

SECOND TONE DURATION
Enter the duration of the second tone. The range is from 0.00 seconds to 9.99 seconds. The digits will be entered without the decimal point.
Example: 1.00 seconds would be entered "100"

The duration of the second tone will require a 3-digit entry. This entry will not require a decimal point and any value between 0.00 and 9.99 seconds may be used.

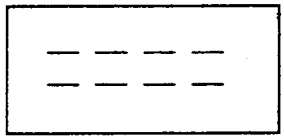
QUESTION 7: 1-Digit; 0-3

SELECT ALERT
Enter the digit for the alert to follow this custom call.
0 - No Alert
1 - Slow Siren
2 - Fast Siren
3 - HI/LO Warble

An alert may be assigned to each custom call which will be transmitted each time the call is selected either from the keypad or from an INSTANT CALL button.

Once the digit for "Question 7:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

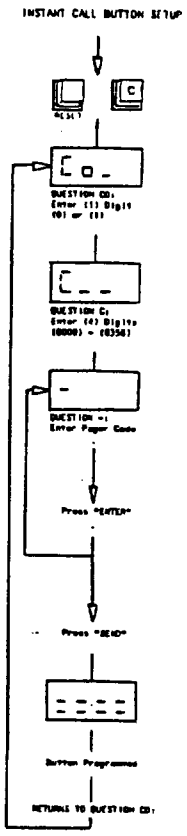
```
**************************************************************************
* Caution: Do not remove power or press the RESET button while the       *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                      *
**************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION 0o:".

4. INSTANT CALL BUTTON SETUP FLOWCHART



4. INSTANT CALL BUTTON SETUP INFORMATION

The Model 25 allows a single call or multiple calls of various formats to be assigned to INSTANT CALL buttons. When an INSTANT CALL button is pressed the encoder will sequentially send each of the calls assigned to that button. In this section the individual calls will be assigned to the INSTANT CALL buttons.

To enter the INSTANT CALL SETUP Section, from the keypad:

a.) PRESS and HOLD the "RESET" key.

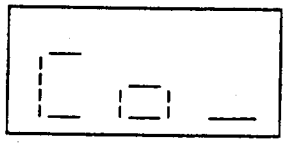
b.) While still holding the "RESET key, PRESS and HOLD the "C" key.

c.) While still holding the "C" key, RELEASE the "RESET" key.

d.) Now RELEASE the "C" key.

Or, from a remote CRT or computer,
enter "C" from the main menu.

This will put you into the INSTANT CALL BUTTON SETUP Section and the display will show the prompt for the first question.



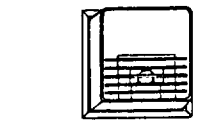
```
QUESTION Co:  1-Digit; 1-4

        1 - CHANGE SETTINGS
        2 - PRINT ALL SETTINGS
        3 - PRINT SELECTED SETTINGS
```

1 - CHANGE SETTINGS
Entering a "1" will instruct the Model 25 to continue on to "Question: C".

2 - PRINT ALL SETTINGS
Entering a "2" will instruct the Model 25 to print the settings of all questions in this section to the printer or CRT display connected to the serial port.

3 - PRINT SELECTED SETTINGS
Entering a "3" will instruct the Model 25 to prompt for the number of the setting within this section which is to be sent to the printer or CRT display. (Information on connecting a printer to the Model 25 is located in the "Model 25 Technical Manual").



QUESTION C: Press the "Instant Call Button" to be programmed.

INSTANT CALL BUTTON SELECT
1.) Press the Instant Call Button to be programmed.
2.) The display should now display a dash "-".
If not then press the lower left hand Instant Call (Review Before Send) button on the panel that contains the Instant Call Button to be programmed.

"Question C:" asks you to select an INSTANT CALL button to be programmed. This can be easily done by pressing the INSTANT CALL button you would like to program. Once the button has been pressed the display should show a dash "-" which is the prompt for the next "Question -:". If the display does not change then "Question 3:" in the "GENERAL AND SEND BUTTON SETUP" Section has been set to "1" (Enabled). This requires that the lower left hand INSTANT CALL button that has been selected to act as a "SEND" button rather than an INSTANT CALL button, be pressed in order to continue on to the next question. (For more detailed information on various other means for selecting the INSTANT CALL button to be programmed refer to the "Model 25 Technical Manual".)

From a remote CRT or computer, enter the 4-digit button number as derived from the table below.

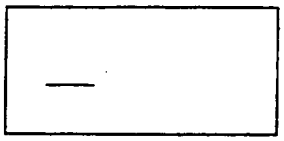
Each Instant Call key represents a call stack via a four-digit position dependent number. The number generated by each key is in the form '0prc'. The meaning of each digit is:

'0' leading digit used to access the stack block,
'p' panel number on which the key resides,
'r' row number of the key,
'c' column number of the key,

The number for the Instant Call panel inside the encoder enclosure is '0' for the half sized panel of the encoder with keypad (901-9019) and '1' for the full sized panel of the encoder without keypad (901-9022). The panel number of the Auxiliary Instant Call panels depend on the placement of the address jumper at time of installation. The possible panel numbers for the Auxiliary panels (901-9020) are '1', '2', and '3'.

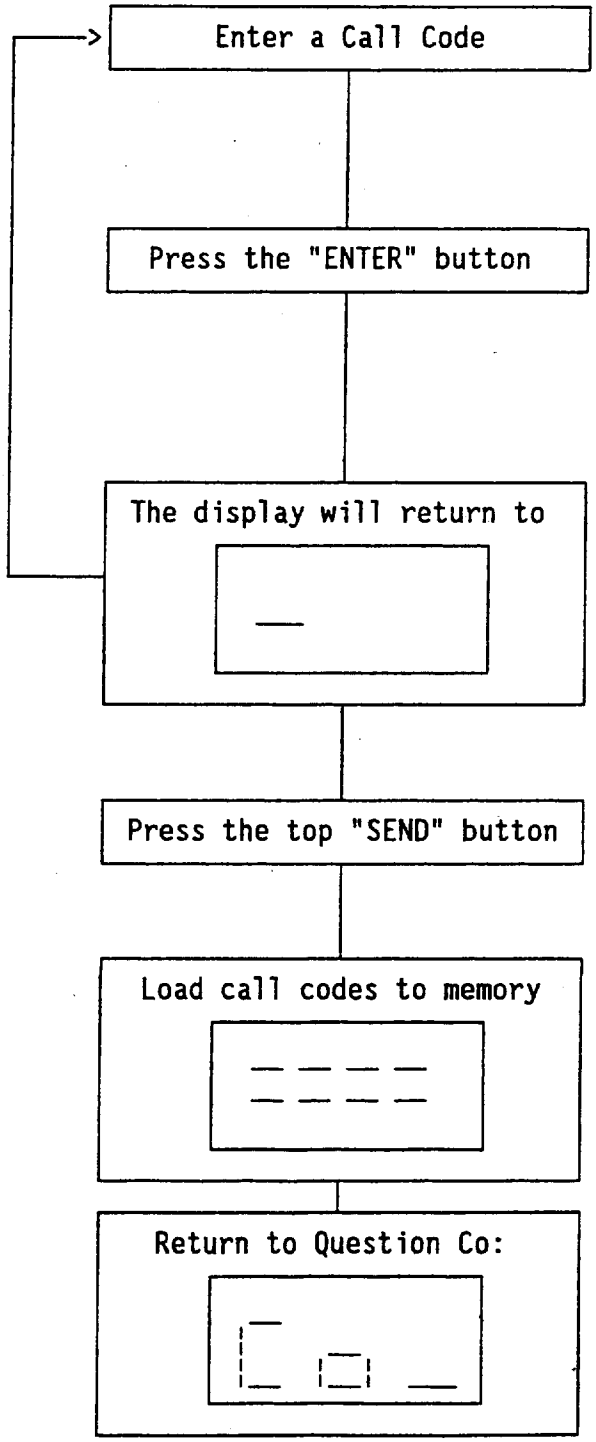
--- HALF SIZE PANEL ----				
0000	0001	0002	0003	0004
0010	0011	0012	0013	0014
0020	0021	0022	0023	0024
0030	0031	0032	0033	0034
0040	0041	0042	0043	0044
0050	0051	0052	0053	0054
SEND				CLEAR
QUEUE				

--------- FULL SIZE PANEL (p=1, 2 or 3) ---------									
0p00	0p01	0p02	0p03	0p04	0p05	0p06	0p07	0p08	0p09
0p10	0p11	0p12	0p13	0p14	0p15	0p16	0p17	0p18	0p19
0p20	0p21	0p22	0p23	0p24	0p25	0p26	0p27	0p28	0p29
0p30	0p31	0p32	0p33	0p34	0p35	0p36	0p37	0p38	0p39
0p40	0p41	0p42	0p43	0p44	0p45	0p46	0p47	0p48	0p49
0p50	0p51	0p52	0p53	0p54	0p55	0p56	0p57	0p58	0p59
SEND									CLEAR
QUEUE									



QUESTION -: 2 - 9 Digits

CALL CODE ENTRY
Enter one or more call codes into the INSTANT CALL button selected in "Question C:". The procedure for entering these calls is outlined below.



1.) Enter the first call code.

The leading digit must be entered first, followed by format code digits.

2.) Press the "ENTER" button.

The Model 25 will load the call code into a temporary holding area until all call code entries are complete.

3.) The display will return to the "-" prompt.

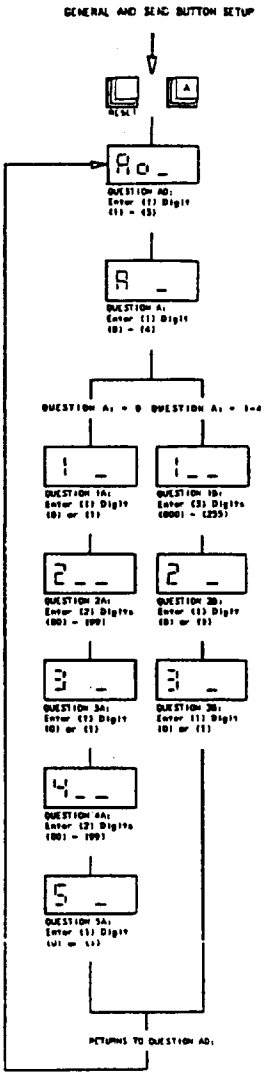
At this time another call code may be entered followed by the "ENTER" key, this may continue until all call codes have been entered.

4.) Once all call codes have been entered the top "SEND" button must be pressed completing the entry process.

5.) The Model 25 will load all of the call codes entered into the selected instant call button.

6.) The Model 25 will return to the beginning of the section (Question Co:) where another INSTANT CALL button may be programmed by completing the question loop again.

5. GENERAL AND SEND BUTTON SETUP FLOWCHART



5. GENERAL AND SEND BUTTON SETUP INFORMATION

In this section the features that control the overall operation of the Model 25 as well as the SEND buttons will be set up.

To enter the GENERAL AND SEND BUTTON SETUP Section, from the keypad:

a.) PRESS and HOLD the "RESET" key.

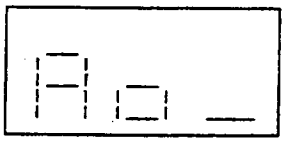
b.) While still holding the "RESET key, PRESS and HOLD the "A" key.

c.) While still holding the "A" key, RELEASE the "RESET" key.

d.) Now RELEASE the "A" key.

Or, from a remote CRT or computer,
enter "A" from the main menu.

This will put you into the GENERAL AND SEND BUTTON SETUP Section and the display will show the prompt for the first question.



```
QUESTION Ao:  1-Digit; 1-3

        1 - CHANGE SETTINGS
        2 - PRINT ALL SETTINGS
        3 - PRINT SELECTED SETTINGS
```

1 - CHANGE SETTINGS
Entering a "1" will instruct the Model 25 to continue on to "Question: A".

2 - PRINT ALL SETTINGS
Entering a "2" will instruct the Model 25 to print the settings of all questions in this section to the printer or CRT display connected to the serial port.

3 - PRINT SELECTED SETTINGS
Entering a "3" will instruct the Model 25 to prompt for the number of the setting within this section which is to be sent to the printer or CRT display. (Information on connecting a printer to the Model 25 is located in the "Model 25 Technical Manual").

QUESTION A: 1-Digit; 0-4

GENERAL OR SEND BUTTON SETUP
Enter a "0" to configure the general operation of the Model 25.
Enter a 1,2,3 or 4 to configure the first, second, third, or fourth SEND button.
0 - Set General Operation
1 - Set SEND button "1"
2 - Set SEND button "2"
3 - Set SEND button "3"
4 - Set SEND button "4"

Set General Operation ("0" Entered in "Question A:")

Answer the following questions if "0" was entered for "Question A:".

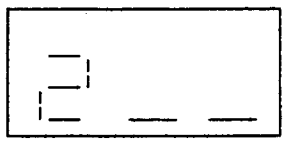
0 - Default Setting

QUESTION 1: 1-Digit; 0-1

SELECT RELAY OPERATION
The 8 Select Relays may operate in two ways, Direct and Momentary.
DIRECT - The Select Relays will close prior to the tones being sent and remain closed for the entire time of transmission. This mode should be used if the Select Relays are to directly key the transmitters
MOMENTARY-The Select Relays will close, then open prior to the PTT relay closing and tones being sent. This mode should be used if the Model 25 is mounted into a Console and the Select Relays are to be connected across the "Select" buttons of the Console.
0 - DIRECT CHANNEL KEYING
1 - MOMENTARY CHANNEL KEYING

This question selects the "Keying" operation of the Select Relays. If "0" is selected then the Select Relays will act as a PTT (Push-to-talk) relay remaining closed for the entire time of transmission. This mode is normally used if the Select Relays are used to directly key multiple transmitters.

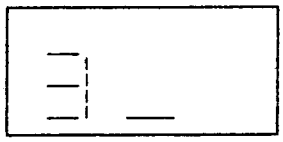
If the Model 25 is installed into a standard console the Select Relays will normally be connected across each channel's "Select" button. In this case the "Momentary" select mode should be used. The Select Relays will close, then open prior to the PTT relay closing and the tones being sent. This action allows the Model 25 to select a channel the same as pushing the consoles "Select" button manually.



00 - Default Setting

QUESTION 2: 2-Digit; 00-99

KEY-UP DELAY
The keyup delay is the time between the PTT closing and the tones being sent. This time should be set so that the transmitter has time to keyup and settle prior to receiving the tones. The range is 0.0 seconds to 9.9 seconds. (Normally 1.0 second).
Example: 1 second would be entered as "10".

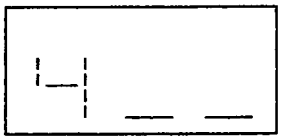


0 - Default Setting

QUESTION 3: 1-Digit; 0-1

REVIEW BEFORE SEND
The Review Before Send feature changes the use of the lower left instant call button. If set to "1" the button will act as a "Send Page" button.
0 - Review Before Send (Disabled)
(Lower left button functions as Instant Call button.)
1 - Review Before send (Enabled)
(Lower left button functions as "Send Page" button).

If "Review Before Send" is selected (entry 1), then following the press of an Instant Call button the lower left "Review Before Send" button must be pressed before the calls assigned to the selected Instant Call button will be sent. If "0" is entered in response to "Question 3:" then the lower left button will function as a standard INSTANT CALL button.

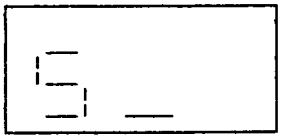


10 - Default Setting

QUESTION 4: 2-Digit; 00-99

STACK DELAY
The Stack delay is the amount of time to elapse between pages of an instant call stack. The range is 0.0 seconds to 9.9 seconds.
Example: 1 second would be entered as "10".

This time should be set so that the second tone of the first call does not follow to close to the first tone of the second call resulting in the falsing of a pager.



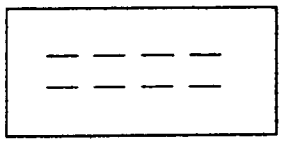
0 - Default Setting

QUESTION 5: 1-Digit; 0-1

CHANNEL SIMULSELECT FUNCTION
In most Consoles a "Simulselect" button must be pressed and held in order for the console to allow more than one channel to be selected at one time. If this is the case then this question must be answered with a "1" resulting in the Model 25 changing the operation of the tone relay to function as a "SIMULSELECT" relay.
If a "0" is entered then the "tone" relay will function normally as a tone relay.
0 - Tone Relay (Normal Operation)
1 - Tone Relay (Simulselect function)

Once the digit for "Question 5:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

```
**************************************************************************
* Caution: Do not remove power or press the RESET button while the       *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                      *
**************************************************************************
```

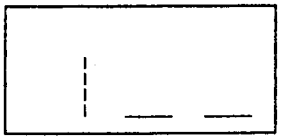


When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION Co:".

Set SEND Button Operation ("1,2,3,4" Entered in Question A:)
Selecting either a 1,2,3 or 4 for "Question A:" will result in the first, second, third, or fourth SEND button being configured. Each SEND button is configured individually and therefore 4 passes through this section's question loop are required in order to configure all four SEND buttons.

The SEND buttons function is to act as a PAGE or SEND key for manual entry of pager codes from the keypad. Each of the SEND buttons may be programmed with a different combination of Select Relays and channels to be monitored. Once a pager code is entered on the keypad, one of the SEND buttons must be pressed to instruct the Model 25 to send the call on the selected channels programmed into that particular SEND button.

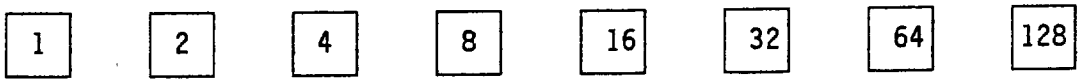


000 - Default Setting

QUESTION 1: 3-Digit; 000-255

CHANNEL SELECT RELAYS
Enter the 3-digit number for the Channel Select Relay combination required for this format.

The Model 25 is equipped with 8 channel select relays. These relays are provided for the automatic selection of channels and may be activated in any combination. The 3-digit number entered determines which of the relays will be activated when a call is entered from the keypad and the SEND button is pressed. The diagram below will assist you in determining the number required for the relay selection desired.



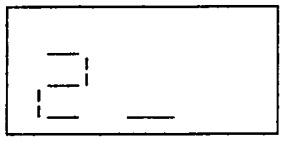
To select the proper number, add the numbers within the boxes of the relays to be activated.

EXAMPLE: To select Relays 1,3,5 and 8.

"Add" - 1 + 4 + 16 + 128 = 149

NOTE: Entering the number "255" for "Question 1:" will instruct the Model 25 to select the relays assigned to the format in the "TONE FORMAT SELECTION" Section.

QUESTION 2: 1-Digit; 0-1



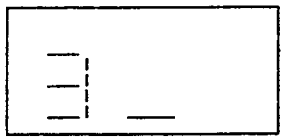
0 - Default Setting

BUSY INPUT POLARITY
This question determines whether the Busy Input for the selected SEND button is "BUSY" when the input is closed or open.
The LED will be "ON" when the Input is in the "BUSY" condition.
0 - "BUSY" when the input is (CLOSED).
1 - "BUSY" when the input is (OPEN)

For the input to be considered "closed" it must be shorted to the Model 25 connector (P3-pin 2) or in cases where a transistor or gate is controlling the input, near ground.

If the input is not shorted or the transistor or gate is holding the input high then the input is considered to be "open".

QUESTION 3: - (1) Digit ; 0-1

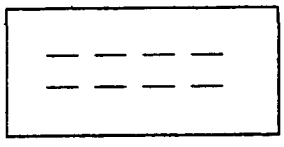


0 - Default Setting

BUSY INPUT MONITOR?
If a "0" is entered the Model 25 will ignore the "BUSY" condition of the Busy input.
If a "1" is entered then the Model 25 will monitor the condition of the input.
0 - Ignore Channel Busy Input
1 - Monitor Channel Busy Input

Once the digit for "Question 5:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made. During the time that the Model 25 is loading this information to memory the display will appear as shown below.

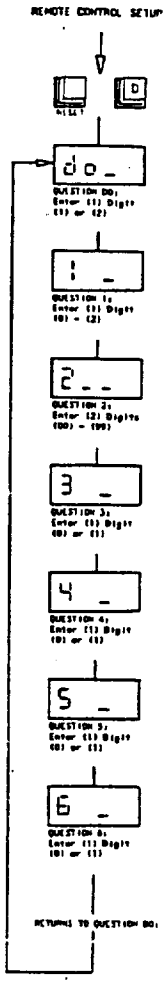
```
**************************************************************************
* Caution: Do not remove power or press the RESET button while the       *
*          Model 25 is loading the memory. Otherwise incorrect information *
*          could be loaded requiring reprogramming.                      *
**************************************************************************
```



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION Ao:".

6. REMOTE CONTROL SETUP FLOWCHART



6. REMOTE CONTROL SETUP INFORMATION

The Remote Control Setup Section configures the serial port for connection to a printer for call logging, a computer system for CAD operation, or connection to an IBM compatible computer for remote programming of the Model 25 (Not covered in this programming guide).

To enter the REMOTE CONTROL SETUP Section, from the keypad:

a.) PRESS and HOLD the "RESET" key.

b.) While still holding the "RESET" key, PRESS and HOLD the "D" key.

c.) While still holding the "D" key, RELEASE the "RESET" key.

d.) Now RELEASE the "D" key.

Or, from a remote CRT or computer,
enter "D" from the main menu.

This will put you into the REMOTE CONTROL SETUP Section and the display will show the prompt for the first question.

```
QUESTION Do:  1-Digit; 1-2

        1 - CHANGE SETTINGS
        2 - PRINT ALL SETTINGS
```

1 - CHANGE SETTINGS
Entering a "1" will instruct the Model 25 to continue on to "Question: 1".

2 - PRINT ALL SETTINGS
Entering a "2" will instruct the Model 25 to print the settings of all questions in this section to the printer or CRT display connected to the serial port.

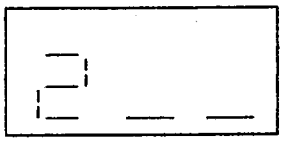
0 - Default Setting

QUESTION 1: 1-Digit; 0-2

BAUD RATE SELECT
Select the operating baud rate for the Model 25 serial port.
Note: A baud rate of 4800 should be used if possible.
0 - 4800 baud rate
1 - 600 baud rate
2 - 150 baud rate

The Baud Rate is the speed at which information or "data" is transferred between two devices. The Model 25 communicates with the printer or computer connected to the serial port at the baud rate as well as its own instant call panel and any auxiliary panels connected. Therefore it is desirable to have the highest baud rate possible.

Reasons for using a baud rate lower than 4800 would be if the printer or computer attached to the serial port was not capable of operating at 4800. In this case one of the lower rates must be used.



01 - Default Setting

QUESTION 2: 2-Digit; 00-99

NEW LINE NULLS
Enter the number of ASCII NULL characters to be sent following a "Line Feed" or"Carriage Return". The range is 00 - 99.

A "NULL" is a "Do Nothing" character also known as a "Pad" character. A number of these may be sent to allow the receiving device to "Catch up". For example if a printer is not capable of receiving characters while it performs a "Carriage Return" (returns the print head to the beginning of the next line), then NULL characters would be required to allow the printer time to perform this function before the next usable characters arrive.

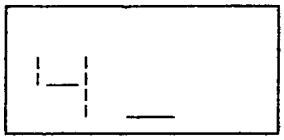
0 - Default Setting

QUESTION 3: 1-Digit; 0-1

SEND BELL CHARACTER
This sets whether the Model 25 sends a "BELL" character to the serial port when the annunciator beeps.
0 - No BELL character sent
1 - Send BELL character

The "BELL" character (Control G) may be sent when ever the Model 25's annunciator sounds. Many printers and CRT display terminals will respond to a BELL character by sounding their own annunciator.

QUESTION 4: 1-Digit; 0-1

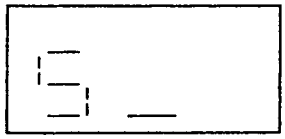


0 - Default Setting

CTS MONITOR
This question determines whether the Model 25 will monitor the "CTS" line while transmitting to the serial port.
0 - Do not Monitor CTS
1 - Monitor CTS

The CTS line on the serial port is used to "hold off" the Model 25 from transmitting until the receiving device is ready, however monitoring this line could slow the operation of the encoder.

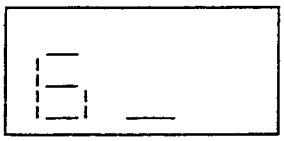
QUESTION 5: 1-Digit; 0-1



0 - Default Setting

CTS BUSY POLARITY
Set the polarity of the CTS signal for its BUSY condition.
0 - When CTS is "Low" or at a "MARK" level CTS will be considered BUSY.
1 - When CTS is "High" or at a "Space" level CTS will be considered BUSY.

QUESTION F: 1-Digit; 0-1

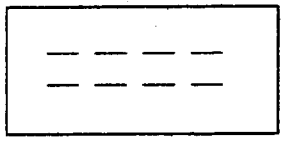


0 - Default Setting

LOGGING ENABLE
Selection of this digit will affect the output information from the Model 25. If the Encoder is to be computer controlled or logging is not desirable then select "0".
If a printer or logging device is to be connected to the serial port then select "1". Use "1" only when required.
0 - Logging (Disabled)
1 - Logging (Enabled)

Once the digit for "Question 6:" has been entered the Model 25 will immediately begin to load all changes made in this section to memory to be used until new changes are made.

****
* Caution: Do not remove power or press the RESET button while the *
* Model 25 is loading the memory. Otherwise incorrect information *
* could be loaded requiring reprogramming. *
****



When the Model 25 is loading the information to memory the display will appear as shown.

Once the Model 25 completes the loading procedure it will return to the first question in this section, "QUESTION Do:".

3. FORMAT SPECIFICATIONS

MOTOROLA AND G.E. TONE GROUP FREQUENCIES

Tone Number	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 Number	Tone Groups						
	Mot B	Mot Z	GE A′	GE B′	GE C′	Mot 10	Mot 11
0	371.5	346.7	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

MOTOROLA AND G.E. CODE PLANS

	Code Plans								
Pager Cap-Code	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

	Code Plans								
Pager Cap-Code	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

	Code Plans							
Pager Cap-Code	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

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

GENERAL ENCODING PLANS

Pager Cap-Code	General Plan Tone Groups	General Plan Diagonal Tone	Modified General Plan Tone Groups	Modified General Plan Diagonal Tone
0xx	4+2	N/A	N/A	N/A
1xx	1+1	569.1	1+1	569.1
2xx	2+2	979.9	2+2	979.9
3xx	1+2	N/A	3+3	569.1
4xx	4+4	569.1	4+4	569.1
5xx	5+5	979.9	5+5	979.9
6xx	2+1	N/A	6+6	979.9
7xx	4+5	N/A	N/A	N/A
8xx	5+4	N/A	N/A	N/A
9xx	2+4	N/A	N/A	N/A
**Axx	3+3	569.1	N/A	N/A

Pager Cap-Code	General Alternate Plan Tone Groups
0xx	N/A
1xx	953.7 + Mot 1
2xx	953.7 + Mot 2
3xx	979.9 + Mot 2
4xx	953.7 + Mot 4
5xx	953.7 + Mot 5
6xx	979.9 + Mot 1
7xx	979.9 + Mot 5
8xx	979.9 + Mot 4

Tone Groups: 1,2,3,4,5 1,2,3,4,5,6

Notes: 1) On General and Modified General plans, there are different diagonal tones for different pager blocks.
2) **General has an eleventh pager block with cap-codes 'Axx', which is not coded on the Model 25.
3) For General Alternate Code Plan, last two digits of cap-code are the same as each other.

REACH ENCODING PLAN

Tone Number	Freq.	Tone Number	Freq.	Tone Number	Freq.	Tone Number	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

ZETRON TONE GROUPS FOR REACH ENCODING

Tone Number	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

REACH CODE PLAN

Pager Cap-Code	Indiv. 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 GE/Motorola plans, 1st tone is always tens digit, and 2nd tone is ones digit.

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

5/6-TONE FREQUENCIES AND TIMINGS

	Tone Number	EIA	CCIR	ZVEI
freqs in Hz	0	600	1981	2400
	1	741	1124	1060
	2	882	1197	1160
	3	1023	1275	1270
	4	1164	1358	1400
	5	1305	1446	1530
	6	1446	1540	1670
	7	1587	1640	1830
	8	1728	1747	2000
	9	1869	1860	2200
2nd Addr	X	2010	2247	970
Repeat	R	459	2110	2600
timing in msec	Preamble	673	673	673
	Gap	65	65	65
	Tone	33	40	100
	X Tone	65	40	100

DTMF TONE PAIR FREQUENCIES AND TIMING

Key from 16-button keypad/frequencies in Hz

	Columns			
	1	2	3	4
Rows				
	--1--	--2--	--3--	--A--
1	697	697	697	697
	1209	1336	1477	1633
	--4--	--5--	--6--	--B--
2	770	770	770	770
	1209	1336	1477	1633
	--7--	--8--	--9--	--C--
3	852	852	852	852
	1209	1336	1477	1633
	--*--	--0--	--#--	--D--
4	941	941	941	941
	1209	1336	1477	1633

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

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

Tone Number	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

Timing: Variable.
Typical timing: 1250 ms 1st tone pair
0 ms gap
1000 ms 2nd tone pair
5000 ms group call (if 1st and 2nd tone pairs are same)

DIGITONE FORMAT

6-Digit Capcode Range: 000000-655354

First 5 digits - Address 00000-65535
Sixth digit - Function Code 0-4 (0=cancel function)
Selectable number of repeats = 3-9 (4 normal)

GOLAY SEQUENTIAL FORMAT

7-Digit Capcode

First 6 digits - Address NNNNNN
Seventh digit - Function 0-9
Allows tone, voice, and message paging.