Mass Notification

Whelen Engineering Siren Diagnostic & Programming Software Users Manual

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Section I: Configuration Software

This section will address the operation of Whelen Configuration Software on a Windows based PC (or laptop) connected to a siren station. With this software, the owner can not only make configuration changes to a specific station but also collect valuable diagnostic data from a given station.

This software has been designed for use with many different Whelen outdoor warning systems. As such, several configuration screens will offer options applicable only to the system selected in the Siren Page. This section will demonstrate programming procedures using a WPS-series system. The WPS has features that are common to many other systems.

WARNING: Operation of this software is simple, but the accidental entry of incorrect or inaccurate data to the station could cause malfunctions to occur. Use of this software should be restricted to trained, authorized personnel only!

Familiarization with the software will allow the user to efficiently:

• **Make configuration changes**
• **Extract the current configuration from the station**
• **Obtain valuable diagnostic information**
• **Activate any station function**

The following is an explanation of each screen and entry option presented to the user. The screens shown will represent the information obtained by a PC connected to a sample WPS siren station

Siren Setup -

The Siren Setup page displays the following information:

• **Area Code - Similar to the area codes used in telephone numbers, this area code is used to designate a group of siren stations in a given area. The valid range of area codes is from 000 to 999. The sample station is designated Area Code 123.**

• **Address - This is the number assigned to a specific siren station in a given area code. The valid range of address is from 0000 to 9999. The sample station is designated Address 1354 (see Section II for a detailed explanation of station addressing).**

• **Address Wild Cards - Under certain circumstances, it may be necessary for the control center to transmit commands or requests to multiple siren stations simultaneously. This can be accomplished through the use of "Wild Cards". The Wild Card is a pound sign (#) that functions much like a Wild Card in the game of poker. It can represent any single digit in a station address, provided that the station has been configured to accept a Wild Card in place of a specific digit. Note that the sample siren station is configured to accept wild cards in each of the four digits. This is the default setting.**

• **Number of Amps: Displays the number of Siren Amplifiers used in the Model selected on the "Model" Screen. The sample station (WPS-2800-05) uses 5 siren amplifiers.**

• **DVM Test Message - Displays the Digital Voice Message (DVM) that will be generated when the "DVM Test" control is activated via the "DVM TEST" control on the front panel. The sample station is using DVM 1 as its DVM Test message.**

The "Dip Switches" section of the Siren Setup page displays what options are available for the sample station (Note that options that are not available for the selected siren series will be unavailable for selection):

- **Solar** - When checked, the station is configured to use the solar powered battery charger option.

- **Feedback on Strobe Fault** - When checked, the controller board is configured to transmit a fault message to the control center in the event of strobe light failure.

- **Feedback on Low Battery** - When checked, the controller board is configured to transmit a fault message to the control center in the event of a low battery condition message to the control center.

- **Feedback on Intrusion** - When checked, the controller will transmit a message to the control center if the Intrusion sensor detects an open cabinet door.

- **Tone Ramp-Up** - When checked, the volume of the siren tones, when activated, will begin at a lower audio level and ramp-up to full volume.

- **Checksum Enabled** - As of this writing, this feature is not yet available.

- **DVM Mode 1**

- **MOSCAD**

- **Alternate Tones**

- **One Instant Status FB**

- **Continuous Air Horn**

Other items may be present depending upon the selected model. However in most cases these items will not be available for selection and may only serve as a visual reference to components integral to those specific models.

The "Strobelights" section of the Siren Setup page displays the specific conditions that if enabled, will cause the strobe light (optional) to either turn on or off.

- **Enable by SI TEST® command** - Place a checkmark in this box to configure the strobe light to turn on when a SI TEST command is issued. Not used with IPS systems.

- **Enable by activation of warning tones** - Place a checkmark in this box to configure the strobe light to turn on when any warning tone is generated.

- **Enable by voice commands** - Place a checkmark in this box to configure the strobe light to turn on when voice commands are broadcast.

- **Disable by any CLEAR command** - Place a checkmark in this box to configure the strobe light to turn off by the CLEAR command.

If no boxes are checked, strobelights are controlled only by STROBE ON and STROBE OFF commands.

The "Siren Run Times" section of the Siren Setup page displays the duration of siren tone activations. The duration is displayed in a minutes:seconds format. Valid ranges are from 0:10 seconds to 10:00 minutes. The sample station is using a duration of 3:00 minutes (default setting).

To change these settings, click on the time window. A scroll bar will then appear beside that time. Clicking the Left scroll arrow will decrease the duration of the tone in question. Clicking to the Right will increase the duration. Each click equals a 10 second increment.

The "Program", "Request" and "Restore Defaults" buttons function as follows:

- **Program - Clicking on the "Program" button will upload the station configuration information currently on the PC, to the siren station. When this upload is completed, the siren station will then be configured as whatever type of station was defined in the PC. If the siren station is programmed using a configuration designed for a series or model other than that of the station actually being programmed, that station may not function** properly if at all. For this reason, the "Program" button should not be pressed unless it has been confirmed that the information on the PC is the appropriate and desired configuration.

- **Request - This button will extract the current station programming configuration from the station to the PC.**

  NOTE: This should be the first step when the PC is connected to a station.

- **Restore Defaults - This button is used to restore all siren settings to their factory defaults.**

Click on the "Radio Setup" page to proceed to the next section.

Radio Setup Page: Non-Trunking -

The Radio Setup screen is the area of the software where configurations for the optional radio transmitter are defined. If the "Non-Trunking" style is selected, the configuration screen will look like the one shown.

- **Transmitter Warm Up - Amount of time between when the radio keys up, and when transmission begins. The sample station is using the default interval of 1 second.**

- **Program - This button should never be clicked unless it has been confirmed that the radio information displayed is 100% accurate as to how the station in question should be programmed. Failure to do so would compromise the station's** ability to display accurate transmit and/or receive data when the "Request" button has been pressed.

- **Request - This button will extract the current radio information from the station to which the PC is connected.**

  NOTE: To insure that the proper configuration is being modified, the request button should always be pressed before any programming changes are made.

Radio Setup Page: Trunking -

If the "Trunking" style is selected the configuration screen will look like the one shown.

- **Channel Grant Wait** - Determines the amount of time the radio will wait for a channel grant to transmit feedback data to the control station. If a channel grant is not given within the time specified, the station deletes the feedback data and stops further attempts. The interval configured for the sample station is 1 second.

- **Transmitter Delay** - Amount of time between when the radio keys up, and when transmission begins. The interval configured for the sample station is 1 second.

- **Program** - This button should never be clicked unless it has been confirmed that the radio information displayed is 100% accurate as to how the station in question should be programmed. Failure to do so would compromise the station's ability to display accurate transmit and/or receive data when the "Request" button has been pressed.

- **Request** - This button will extract the current radio information from the station to which the PC is connected.

  NOTE: To insure that the proper configuration is being modified, the request button should always be pressed before any programming changes are made.

Click on "Status" page to proceed to the next section.
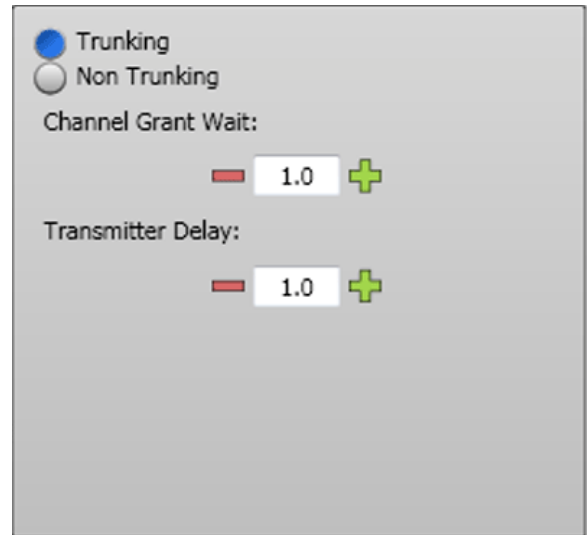
Status Page -

Status Screen displays the functional status of the siren amplifiers. After pressing the "Update Status" button, the screen will display either "OK" or "Fail" beside the installed station amplifier(s). A "Fail" or "Partial" message indicates that the amplifier or speaker connected to the amp in question requires immediate attention.

Additionally, the following information is displayed:
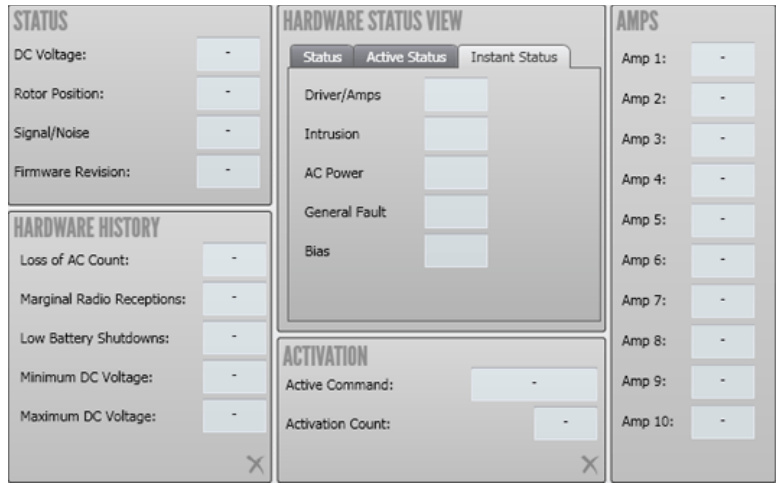
- **DC Voltage - Displays the DC voltage across the station batteries. A voltage range of 26 to 29 VDC is acceptable. Voltages outside this range will require investigation.**

- **Rotor Position - Functional only with WPS-4000 siren systems.**

- **Signal/Noise - Displays the signal-to-noise ratio of the most recently received signal-to-noise request transmission. A reading of 35 dB or higher is preferred. 28 to 34 dB is acceptable. Below 28 dB is an unacceptable reading.**

- **Status - Pressing this button will open a window with status information for the following components:**

Component	Possible Conditions
Driver/Amps -	Fail / Partial / Pass
AC Power -	On / Off
System Power -	OK / Fail
Instant Status -	On / Off
Siren -	On / Off
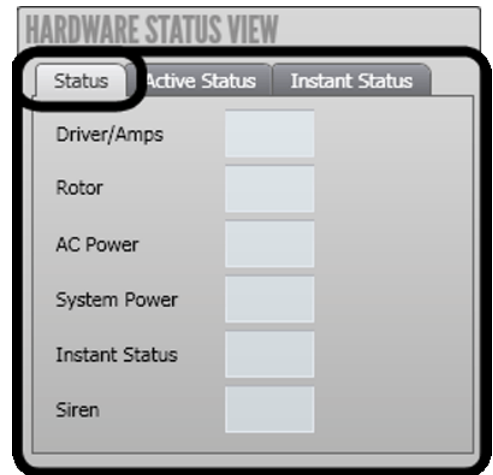
- **Active Status** - Pressing this button will open a window with the following status information:

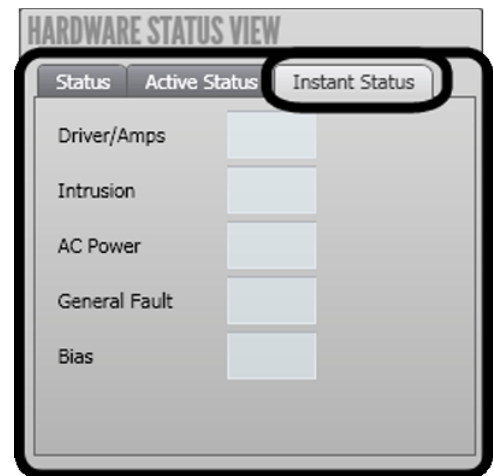 | Component | Possible Conditions |
  |---|---|
  | Driver/Amps - | Fail / Partial / Pass |
  | Bias - | On / Off |
  | Intrusion - | Fail / OK |
  | General Fault - | Fail / OK |
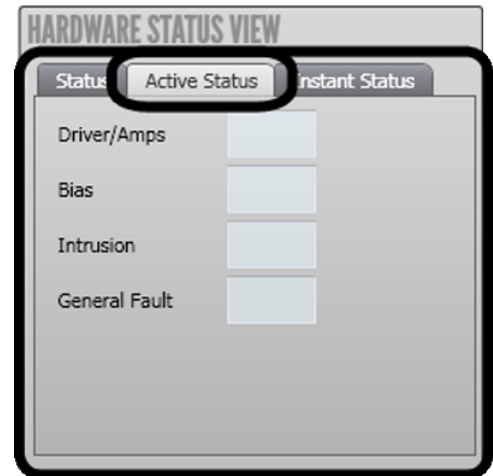
- **Instant Status** - Pressing this button will open a window with the following status information:

Component	Possible Conditions
Driver/Amps -	Fail / Partial / Pass
Intrusion -	Fail / OK
AC Power -	On / Off
General Fault -	Fail / OK
Bias -	On / Off

- **Firmware Revision** - Displays the current revision of the control board firmware.

- **Active Command** - Displays the command that is currently being executed by the stations.

- **Activation Counter** - Displays a count of how many times the station has been activated. Pressing the "Clear" button beside this display resets this counter to zero.

NOTE: The following status displays are cleared as a group whenever the "Clear All" button is pressed. Make sure all status results are noted and if necessary, manually recorded in a log before the "Clear All" button is pressed.

- **Loss of AC Counter** - Displays a count of how many times the station has lost AC power.

- **Marginal Radio Receptions** - Displays a count of the number of times the station received a command/request that it could not execute because of bad, noisy or incomplete data.

- **Low Battery Shutdowns** - Displays a count of the number of times the station shutdown because DC voltage had dropped below 19 volts. This would indicate a battery or battery connection problem.

- **Minimum DC Voltage** - Displays the lowest DC voltage detected since the last time the "Clear All" button was pressed.

- **Maximum DC Voltage** - Displays the highest DC voltage detected since the last time the "Clear All" button was pressed.

Click on the "Activation" page to proceed to the next section.

Activation Page -

The Activation page allows the user to activate the following station functions:

- **Tones** - A pull down list of all available tones: CLEAR, WAIL, ATTACK, ALERT, PUBLIC ADDRESS, AIR HORN, HI-LO, WHOOP, NOON TEST.

- **Digital Voice** - A pull down list of all 16 messages.

- **Rotor Positions** - A pull down list of all rotor positions. Functional only with WPS-4000 siren systems.

- **Misc.** - A pull down list of miscellaneous station functions the user can activate: ARM, DIS-ARM, SIREN ON, SIREN OFF, TEST CLEAR, TRANSMIT OFF, STROBE TEST, STROBE ON, STROBE OFF.

Tones:	Digital Voice:	Rotor Positions:	Misc Functions:
Clear	DV 1	North	Arm
Wail	DV 2	East	Disarm
Attack	DV 3	South	Siren On
Alert	DV 4	West	Siren Off
P-A	DV 5	Clockwise	Test Clear
Air Horn	DV 6	Counter CW	Transmit Off
Hi-Lo	DV 7		Strobe Test
WHOOP	DV 8		Strobe On
Noon Test	DV 9		Strobe Off
Si-Test®	DV 10		Status Req
	DV 11		
	DV 12		
	DV 13		
	DV 14		
	DV 15		
	DV 16		

Send

Please note that only one activation can be designated at a time. Keep in mind that pressing the "Send" button will execute whatever command is currently displayed.

DTMF Page -

The DTMF window allows the user to monitor DTMF data transmissions both to and from the station. The buttons shown on this screen are defined as follows:

- **Enter - When the enter button is clicked, the PC enters the DTMF data stream and displays the information as it is monitored. After the Enter button has been clicked, it changes to an Exit button. The Exit button ends the monitoring of the DTMF data stream. The button function then reverts back to Enter.**

- **Clear - While the PC is monitoring the DTMF data steam, the Clear button erases the current DTMF information from the screen.**

<div style="border: 4px solid black; background: #c8c8c8;">
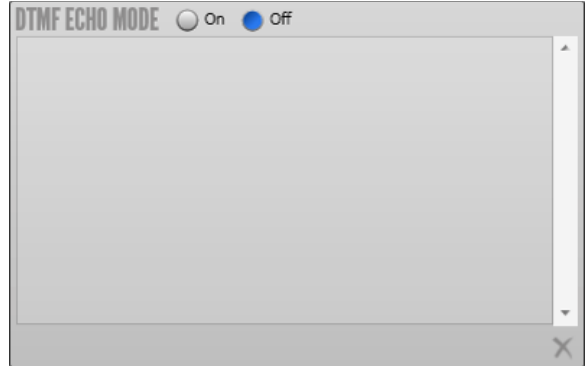
WARNING!

Reconfiguration of any of the parameters defined in this section alters the manner in which the station controller board communicates with the control center. Improper or incorrect reconfiguration may cause the station to malfunction and become inoperable. DO NOT alter any of these values unless you are experienced in the DTMF protocol!

</div>

Multi-Format Decoding Page -

The Multi-Format Decoding page allows custom configuration of the DTMF command structure. Rarely is this ever necessary, as all systems are pre-configured to the customers specifications before it leaves the factory. This section will explain the function of each of the MFD screens.

The first MFD screen allows the user to select if the control board will be configured to receive/ transmit DTMF data that conforms to Whelen protocols, or to custom parameters.

MFD (Whelen): Digit Quantity -

If Whelen is selected, the user can select if the equipment will be configured to Whelen's current, 10-digit structure, or to Whelen's previous 8-digit structure. If 10-digit is selected, no further configurations are necessary (or available). If the 8-digit structure is selected, a tap of the vertical scroll bar will open the following window.

MFD (Whelen): 8 Digit Command List -

This window displays a list of all Whelen Decoder Formats. The user may select one of these formats to configure the controller board or select a format to use as the basis for a custom 8 digit configuration.

MFD (Whelen): Command Mapping -

NOTE: Before proceeding, it may be advisable to retrieve and save the controller board's current configuration (via the Request button) as a file on the PC. This will prevent accidental erasure and subsequent, irretrievable loss of pertinent data.

This window presents the user with a complete list of all of the commands associated with the decoder format selected in the previous screen. From here, the user can restructure the established decoder format so that the controller board in question will function in a specific, desired manner.
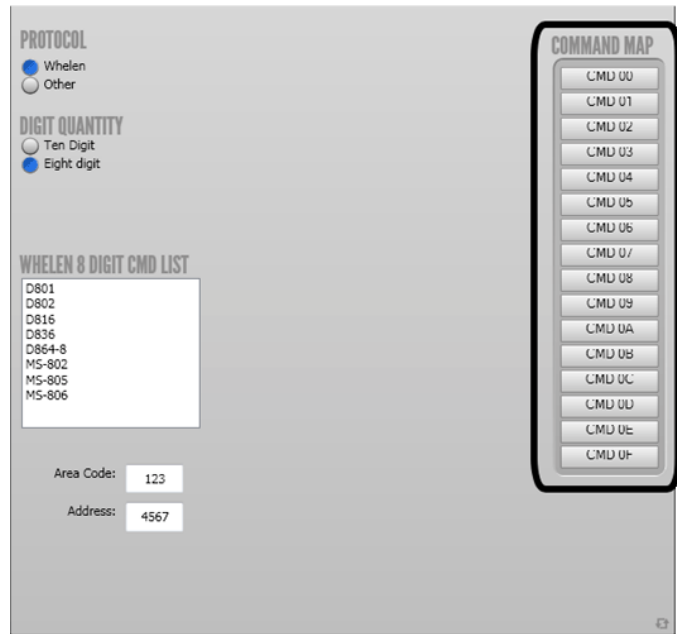
To accomplish this, the user would click on the CMD digit to be re-assigned. A new screen will appear where the user can select the desired event to be executed when the CMD digit is processed. When all desired changes have been made, the user can tap the Program key to upload the current decoder format to the controller board.

IMPORTANT - After the controller board has been programmed, its previous configuration is deleted and can not be retrieved. Before pressing the Program key, confirm that the configuration displayed on the PC contains the correct modifications!

MFD (Whelen): Control Buttons -

Reset - This button will return all command map buttons to an unprogrammed state.

Request - This button will extract the current programming configuration from the PC.

NOTE: To insure that the proper configuration is being modified, the request button should always be pressed before any programming changes are made.

Program - This button uploads the current MFD configuration to the station
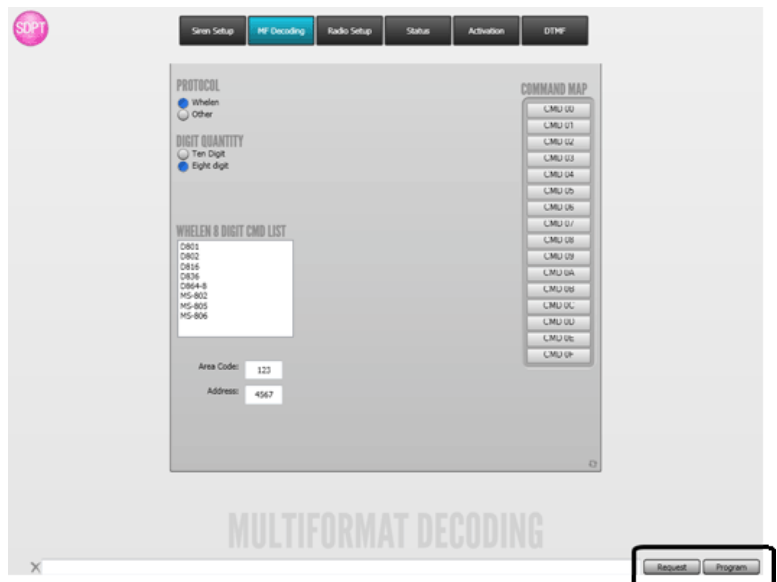
MFD (Other): Digit Quantity/CMD Position

If Other is selected, the lower half of the screen looks like this:

The upper scroll bar allows the user to determine the number of digits in a DTMF data string. The valid range is 3 to 8 digits.

The lower scroll bar allows the user to determine which digit will be the command digit (CMD). The accepted standard places the CMD digit in the last position of a DTMF string. However, if the user wishes, the CMD digit can be assigned to an alternate position. The valid range is from the last position (depending on the digit quantity selected) to the second position.

MFD (Other): Tone Timing -

This window allows the user to set the duration (in milliseconds) of the "ON" time and "OFF" time of the DTMF signal. For example, if the values are set to 167 mS on and 167 mS off, the first digit would sustain for 167 ms, followed by a 167 mS pause before the next digit. After the desired values have been set, tap the vertical scroll bar to proceed to the next window.

MFD (Other): Command Mapping -

In this window, the user can assign a desired command to any available digit. For example, to cause CMD 2 to execute the WAIL siren tone, the user would click on CMD 2. This would open the "CMD 2 Function Mapping" window. Here, any function can be assigned to CMD 2. After the desired function has been selected from its pull-down list, click "Select" to accept the assignments and return to the Command Map screen or "Cancel" to return to the previous screen without accepting new assignments.

Pressing the Reset button will clear all CMD digit assignments.

WARNING! Extreme caution should be exercised before changing the default CMD values.
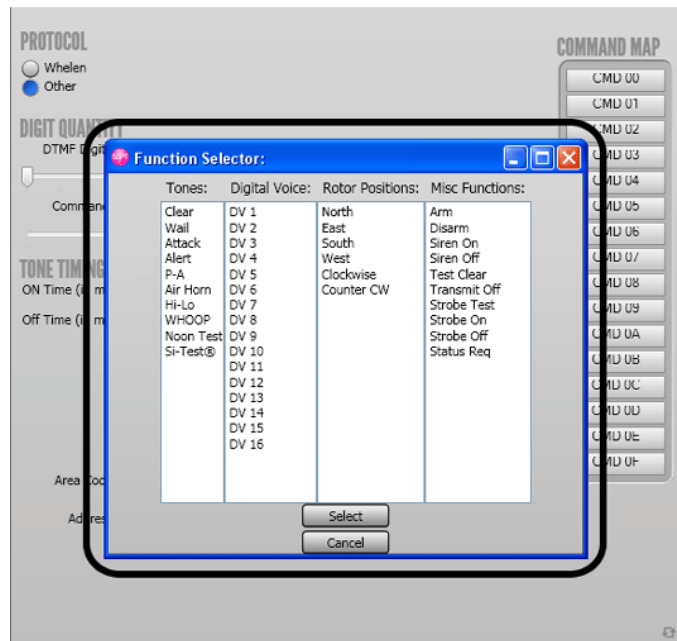
Section II: Understanding Station Addressing

Every Siren Station in a given area code has its own, unique "Station Address". This address allows the user to select an individual or a group of stations. As stated elsewhere in this manual, a valid station address can be any number from 0000 to 9999. This allows for 10,000 unique addresses; a staggering number of stations to keep track of. Although it is logistically impossible to have that many stations in a single area code, it does illustrate the importance of a sensible, intuitive numbering convention for station addresses. This section will outline two types of conventions

## a) Central Point Source: Quadrant, Sector, Radial & Station

Frequently, warning systems are used to notify the public of emergency situations that may occur from a single, centralized location. Typically, siren stations would be located throughout a 360° area surrounding this location for a specified distance from the source. In this scenario, the Central Point Source convention would be well suited.

For illustration purposes, assume the siren stations are installed within a 5 mile radius of the Central Point. As such, a Quadrant, Sector, Radial & Station numbering convention would allow the selection of any of the following:

• any siren station

• all siren stations

• any one of four sectors

• any one of 5 radii within the sectors

The area of coverage in this system, a circle, is divided into 4 quadrants. Each quadrant is then divided into 4 sectors. Each sector is further divided into 5 segments or radii emanating from the center of this siren system.

Central Point (1)

QUADRANTS 1-4

QUADRANT SECTORS

RADII

INDIVIDUAL STATIONS
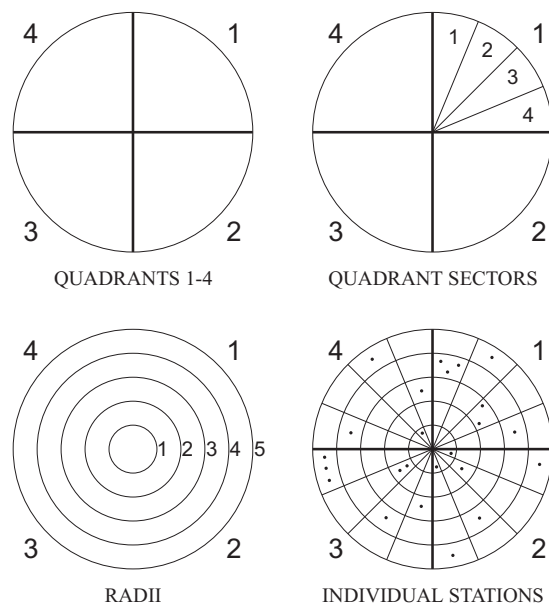
In this system, a stations address is structured as follows:

Digit	Allocation
1	Quadrant (1 to 4)
2	Sector (1 to 4)
3	Radii (1 to 5)
4	Individual station within a radian

Here are some sample activations to further illustrate this concept.
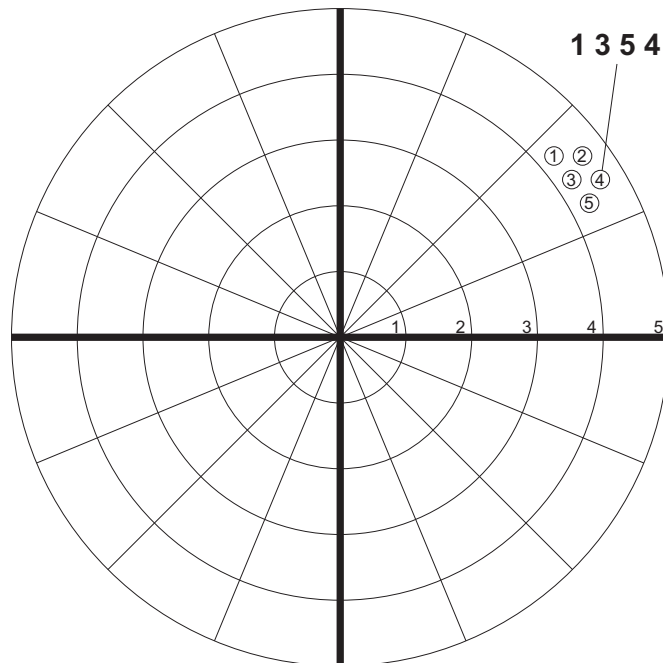
Sample 1:

A station with address 1354 would be located in:

Quadrant: 1

Sector: 3 of Quadrant 1

Radial: 5

Station: 4

If an operator selects station 1-3-5-4, only that station will be selected, as shown.

Central Point (2)

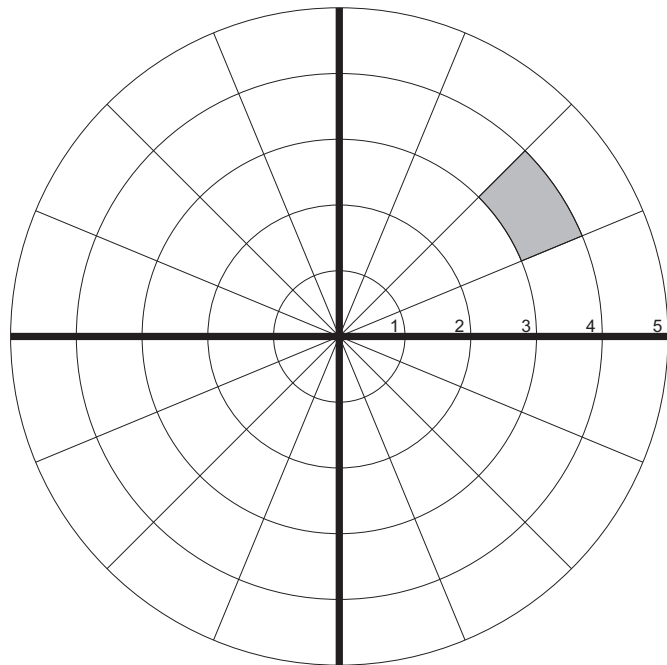SINGLE STATION SELECTION
STATION 1354

Sample 2:

If the activation of a group of remote stations within a whole segment of a radius within a quadrant and sector is desired, the fourth digit address is substituted with a "Wild Card", the "#" pound sign.

An address selection of 1 - 3 - 4 - # would activate the system as follows:

Quadrant: 1

Sector: 3 of Quadrant 1

Radial: 4

Station: # All stations defined by above

This selection is shown below.

Central Point (3)

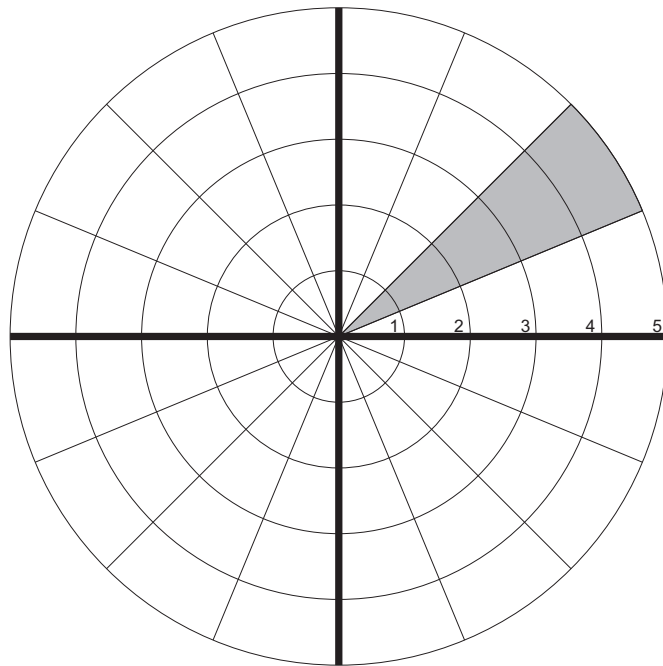GROUP SELECTION-RADIAL SECTOR
GROUP 134#

Sample 3:

Selection of an entire sector can be accomplished by using the following address:

Quadrant: 1

Sector: 3 of Quadrant 1

Radial: # All radial 1 - 5

Station: # All stations defined by above

In selecting a sector, the first two digits of the address are set for the sector address, for example 1 - 3 (Quadrant 1 - Sector 3). The third and fourth digits are substituted with a # (Wild Card). Therefore, the address to select all stations in sector 1-3 is 1 - 3 - # - #. This selection is represented below.

Central Point (4)
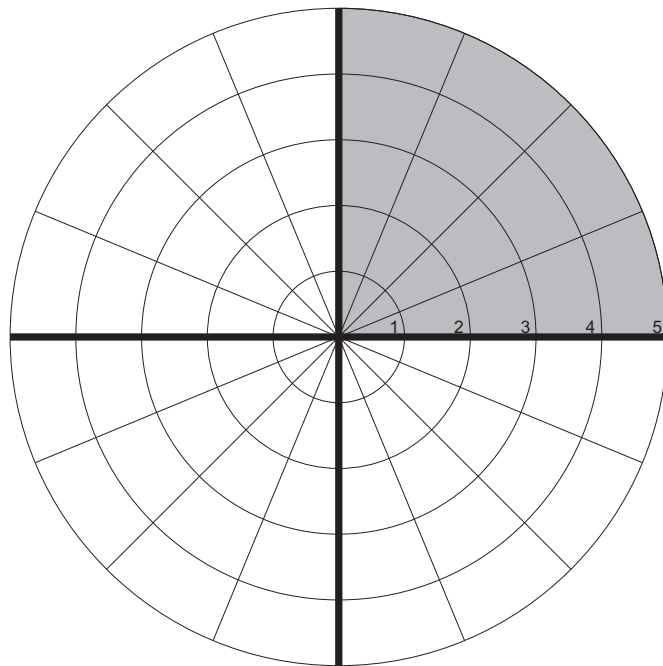
GROUP SELECTION-SUB-SECTOR
GROUP13##

Sample 4:

The selection of a complete quadrant can be achieved by using the following address:

Quadrant: **1**

Sector: **# All sectors of Quadrant 1**

Radial: **# All radials in all sectors of Quadrant 1**

Station: **# All stations defined by above**

When selecting a quadrant, the first digit designates the Quadrant (1). the second, third and fourth digits are replaced with Wild Cards (#,#,#). Therefore, the address for selecting all stations in quadrant 1 is 1 - # - # - # as illustrated below.

Central Point (5)

GROUP SELECTION-QUADRANT
GROUP###

Sample 5:

All stations in a system may be accessed by using the Wild Card (#) for all address numbers. The address would be # - # - # - #.

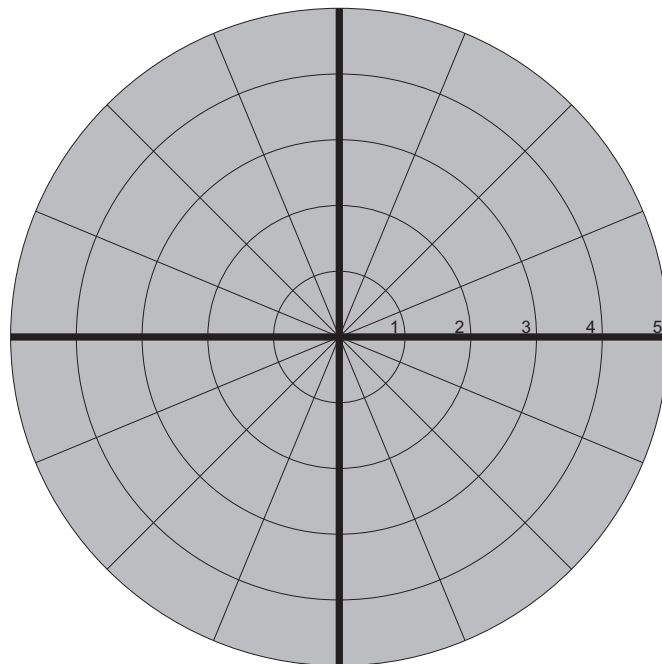**Quadrant:**   **# All Quadrants**

Sector: **# All sectors of all Quadrant**

Radial: **# All radials of all sectors of all Quadrants**

Station: **# All stations defined by above**

This "All Call" is illustrated as shown.

Central Point (6)

GROUP SELECTION-"ALL-CALL"
GROUP ####

b) Zones

For this next type of address structure, assume that the siren system in question is used primarily for warnings throughout a large manufacturing complex. This complex is comprised of three regions with each region having no more than ten areas. Two areas contain more than 50 high-power voice and siren stations.

The following represents a Zoned System 4-digit address configuration, allowing activation by "All Call", regional group activations, area group activations and individual station activations:

```
X            X            X            X
:            :            :..........:.......... Individual Siren Station (0 - 99)
:            :
:            :.................................. Area (0 - 9)
:
:.......................................... Region (0 - 9)
```

An address of 2 - 5 - 4 - 5 would indicate the following individual station:

    Region 2, in Area 5, Siren Station 45.

The Wild Card (#) permits the use of several different types of group activations. Three samples follow:

    Sample 1: Regional Activation (1 - # - # - #)
    All Siren Stations in all Areas in Region 1 will be activated by this transmission.

    Sample 2: Area Activation (1 - 5 - # - #)
    All Siren Stations in Area 5 of Region 1 will be activated by this transmission.

    Sample 3: System All Call (# - # - # - #)
    All Siren Stations in all Area in all Regions will be activated by this transmission.