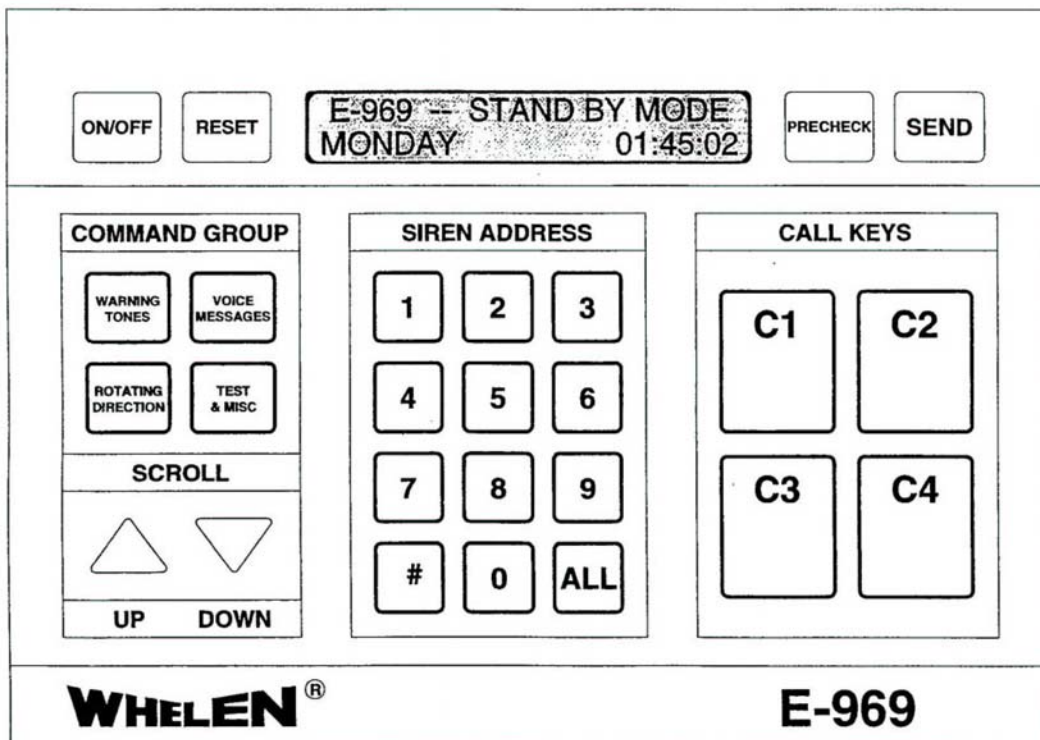


## E-969 ENCODER

### BASIC DESCRIPTION AND OPERATION OF THE E-969 ENCODER





**WHELEN ENGINEERING CO., INC.**

**E-969 ENCODER**

**OPERATION & INSTALLATION MANUAL**

The purpose of this manual is to provide operation and installation information about the use of a Whelen Engineering Company, Inc. Model E-969 Encoder.

Prior to reading this manual or using this product you should be familiar with Whelen Engineering Company's family of High Power Voice and Siren Systems.

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All materials and specifications contained in this document are subject to change without notice.

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## **Introduction**

The E-969 Encoder is a full function, easy to use activation unit for Whelen's family of High Power Voice and Siren System products. The E-969 output is Whelen's standard, reliable 10 digit DTMF protocol.

The E-969 is an attractive, desktop unit designed for simple connection to a base station transmitter. The E-969 has a sealed membrane keypad and low power liquid crystal display. The warning activation sequence consists of:

1. Select a **Command Group**.
2. **Scroll** to the desired function.
3. Enter the four digit **Address**.
4. Press the **Send** button.

The user may select from 35 different command or control functions. In addition, the E-969 supports up to 10,000 unique addresses.

There are also eight Call Keys, which allow the user to program and execute predefined scenarios. Four of the Call Keys are switch accessible, while the other four are accessed through Time Of Day inputs or Remote Activation inputs (as described on pages 6 – 7.)

The liquid crystal display (LCD) is a 2 line by 24 character configuration. The display is backlit for easy reading in low ambient light. When the E-969 is not in use, a running 24 hour clock, day of the week and a stand by message are displayed.

Internal batteries are continuously “trickle” charged to provide long life. The E-969 will maintain its internal clock for up to 3 months after being unplugged. The E-969 comes with a UL listed plug in AC adaptor.

A rear panel, two-piece, screw terminal connector is available for field wiring to a base station transceiver. This connector supports transformer coupled audio, a Push To Talk closure, Squelch monitor input (active high or low), and Channel Grant input for trunking systems.

# Operation

## General

**NOTE:**

Remember the E-969 must be ON, as indicated by the Stand By message on the display!

Operation of the E-969 is a 3 step procedure, as described on the following pages. The basic flow is from left to right. RESET returns operation to the Stand By mode.

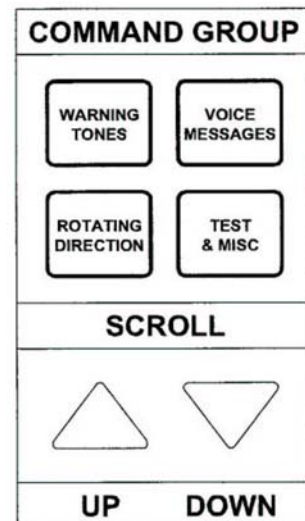
**Step 1** and **Step 2** involve the left hand portion of the keypad, as shown. Select the Command Group by pressing the appropriate button. The display will show the first entry in the selected group. Use the Up or Down arrows to scroll through the functions, within the selected group stopping at the desired function.

## WARNING TONES

CANCEL	Terminates all siren activity.
WAIL	Activates the Wail Tone.
ATTACK	Activates the Attack Tone.
ALERT	Activates the Alert Tone.
PUBLIC ADDRESS	Enables the Public Address mode.
AIR HORN	Activates the Air Horn Tone.
HI-LO	Activates the HI-Lo Tone.
WHOOOP	Activates the Whoop Tone.
NOON TEST	Activates the NOON Test function.

## VOICE MESSAGES

MSG 1	Activates Digital Voice Message 1.
MSG 2	Activates Digital Voice Message 2.
MSG 3	Activates Digital Voice Message 3.
MSG 4	Activates Digital Voice Message 4.
MSG 5	Activates Digital Voice Message 5.
MSG 6	Activates Digital Voice Message 6.
MSG 7	Activates Digital Voice Message 7.
MSG 8	Activates Digital Voice Message 8.
MSG 9	Activates Digital Voice Message 9.
MSG 10	Activates Digital Voice Message 10.
MSG 11	Activates Digital Voice Message 11.
MSG 12	Activates Digital Voice Message 12.
MSG 13	Activates Digital Voice Message 13.
MSG 14	Activates Digital Voice Message 14.
MSG 15	Activates Digital Voice Message 15.
MSG 16	Activates Digital Voice Message 16.



## ROTATING DIRECTION

NORTH	Positions a 4000 Series Siren to North.
EAST	Positions a 4000 Series Siren to East.
SOUTH	Positions a 4000 Series Siren to South.
WEST	Positions a 4000 Series Siren to West.
CLOCKWISE	Increments a 4000 Series Siren 45° CW.
COUNTER CLOCKWISE	Increments a 4000 Series Siren 45° CCW.

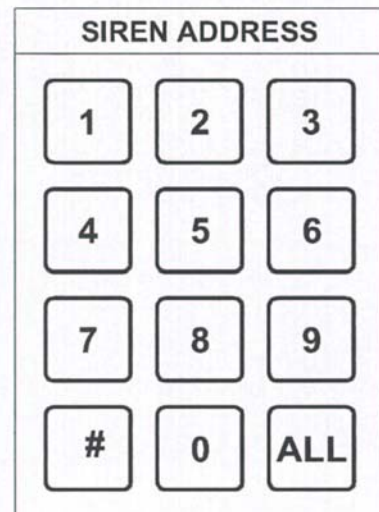
## TEST & MISC

SILENT TEST	Initiates the Silent Test function.
TEST CLEAR	Clear LEDs.
STROBE ON	Activates an external strobe light.
STROBE OFF	De-activates an external strobe light.
PROGRAM ENCODER	Enters E-969 programming mode.

**Step 3** involves the center portion of the keypad, as shown. Enter the four digit address of the target siren. The address is entered with the most significant bit first. The # sign represents a “wildcard” or all values 0 to 9. ALL is a quick way to enter four # signs, to select all sirens in the system.

Example: To enter the address 1234, the user presses 1 first, then 2, then 3, and 4 at last. The display will change as shown below.

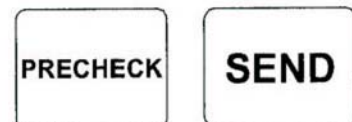
ADDR = 1???  
ADDR = 12??  
ADDR = 123?  
ADDR = 1234



### NOTE:

Entering more than four values will “bump” the address to the left. For instance, assume the user presses key 5 at the end of the previous example, the address will change to 2345.

**Step 4** consists of deciding whether or not to send the selected command. Pressing the SEND key will send the command.

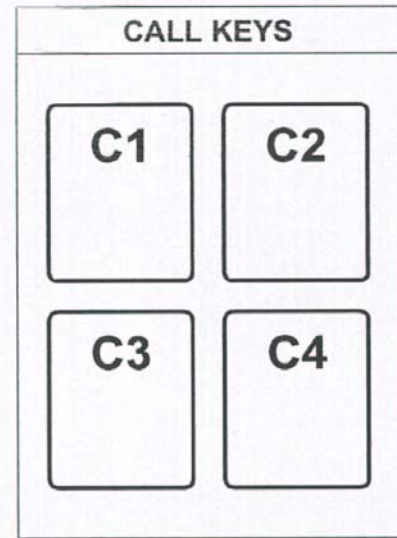


**There is NO second chance!**

The user may select PRECHECK instead of SEND. Refer to page 8 for using the PRECHECK function.

## Call Keys

There are 8 Call Keys. Call Keys 1-4 are located on the right side of the keypad as shown. C1 is Call Key 1, C2 is Call Key 2 and so on. Call Keys 5-8 are “hidden” keys that can be accessed by the remote inputs and timed transmissions. Each Call Key may have up to 100 sequences (00-99). All of the Call Keys combined can use a maximum of 256 sequences. When a Call Key is selected and sent, it starts with sequence 00 and continues until the next sequence can not be found. A Call Key can not activate another Call Key. When a Call Key is active, the key number, active sequence, command that was sent, the address and the amount of time until the next sequence is sent, are displayed.



Refer to the Call Key Programming section on page 5 for more information about Call Keys.

## Parameter Programming

There are two ways to program the E-969. It may be programmed through a personal computer or through the E-969 keypad. The following few pages cover programming through a computer serial communications port. The section called “Keypad Programming” on page 9 covers parameter programming through the E-969 itself. Programming the E-969 through a computer requires a serial communication port set up as follows:

Baud Rate	9600
Number of Bits	8
Parity	None
Number of Stop Bits	1

Use PROCOMM PLUS or any other modem communications program to communicate with the E-969.

To program the various parameters of the E-969, type in the variable designation and the variables followed by a single press of the “Enter” key.

The following list shows all of the variables that may be programmed. In the list, the variable name is followed by the possible variable values, as shown in parentheses. The next item shows the format for entering the variable. The format consists of a variable designation, in upper case, an equal sign and the variable values. Last is a description of the variable.

Area Code	(0-9)	AC=nnn	These are the first three digits in the 10 digit DTMF data string.
Transmitter Warm Up	(0.0-9.9)	TW=n.n	Specifies the time from when the transmitter is keyed up until the DTMF data string is sent.

Base ID	(0-7)	ID=n	Specifies the 8 <sup>th</sup> DTMF digit for multiple encoder systems.
Precheck Digit	(0-9, A-F)	PD=n	Specifies the 3 <sup>rd</sup> area code digit when the precheck key is used.
Precheck Duration	(0-9)	PT=n	The time in seconds, the last DTMF digit will be transmitted when precheck is used.
Channel Grant Wait	(1-9)	CW=n	The time, in seconds, the encoder will wait after it has keyed up the transmitter until it aborts the transmission, if the channel grant signal is not received.
Channel Grant Delay	(.0-.9)	CD=.n	Specifies the time, in seconds. The encoder will hold off from sending the DTMF data string after the channel grant signal has been received.

.... where n is the variable value.

## **Call Key Programming**

Call Key Programming consists of entering a series of operations. Each operation consists of a Call Key designation, an equal sign, a two digit Sequence number, a two digit Command number, a four digit Siren address and a three digit Time value. Press "Enter" after the last Time digit to enter the string. A Command Number Table is shown on page 8. Always use three digits when entering the time. Time may be from 000 to 255 seconds.

Example: Create a simple 2 sequence Call Key to broadcast a 30 seconds Wail tone at siren 1002, followed by a 15 second broadcast of Voice Message 1.

Type: C1=00-01-1002-030 and press "Enter".  
C1=01-31-1002-015 and press "Enter".

"C1" specifies Call Key 1. The "00" indicates the Sequence number. The "01" specifies the command number (Wail). The "1002" specifies the address. The "030" is time, in seconds, until the next sequence is processed.

"C1" specifies Call Key 1. The "01" indicates the Sequence number. The "31" specifies the command number (Voice Message 1). The "1002" specifies the address. The "015" is time, in seconds, until the next sequence is processed.

A Call Key may be erased by typing En=, where n is the Call Key number. The entire Call Key is erased.

Example: Erase Call Key 2.

Type: E2= and press “Enter”.

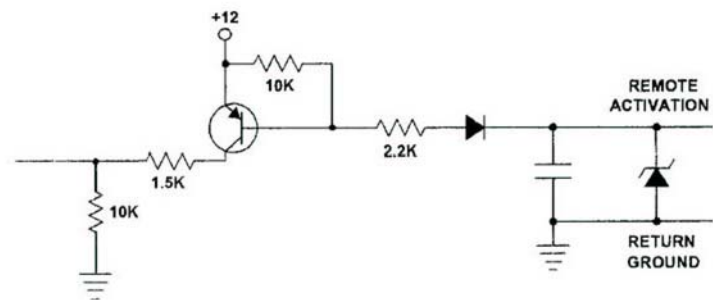
A Call Key may be viewed by typing DCn=, where n is the Call Key number. The data that is programmed for the call key is transmitted from the serial port for viewing on a monitor. All sequences are displayed until sequence is not found.

Example: Display Call Key 2.

Type: DC2= and press “Enter”.

## **Remote Inputs**

The E-969 may be activated from two remote inputs. The typical remote input circuit is shown. A contact closure to ground or a low sequence signal, capable of sinking more than 5 mA, will activate the E-969. The closure must remain active for a minimum of ½ a second.



The remote input may be programmed two different ways. It may activate a predefined Call Key or it may be set for an individual command and address.

Example: Start Call Key 7 when Remote 1 is activated (low).

Type: R1=K7 and press “Enter”. This assumes that Call Key 7 is programmed.

Example: Send the Alert Command to Siren Address 3456 when Remote 1 is active (low).

Type: R1=03-3456 and press “Enter”. The first digits (03) are the command number. The last digits (3456) are the address. A dry contact closure from “Remote #1” and “Return Ground” located in the back of the E-969 will start this transmission.

Example: Send Silent Test to All Sirens when Remote 2 is active (low).

Type: R2=0F-##### and press “Enter”.

## Time of Day Transmissions

The E-969 may be programmed for two different time of day activations. When the internal time clock matches a programmed activation time, the E-969 can either activate a predefined Call Key or it can activate an individual command and address. Note that time is 24 hour time.

The E-969 also allows the user to program “skip” days. These are days when the timed activation will NOT occur. The last digits in the entry are the “skip” days. This number is derived by entering the numbers of the days to be skipped. Sunday = 1, Monday = 2, Tuesday = 3, Wednesday = 4, Thursday = 5, Friday = 6, Saturday = 7. The number 17 indicates that the timed transmit will not occur on Sunday & Saturday. To skip Monday (2), Wednesday (4) & Friday (6), enter 246. For no skip days, enter nothing.

Example: Activate Call Key 5 at noon, seven days a week.

Type: T1=12:00:00-K5 and press “Enter”. Call Key 5 starts at 12 o’clock, seven days a week.

Example: Activate Voice Message 2 at 4:30 PM for all Sirens, Monday through Friday.

Type: T2=16:30:00-32-####-17 and press “Enter”. The first digits are the time the DTMF data string is to be transmitted. The second digits are the command number (32 = Voice Message 2). The third digits are the address (All Call). The 17 means that the timed transmit will not occur on Sunday & Saturday.

## Custom Text

The user may change the display text for Call Keys. Remote activations, Time of Day activations and Voice Messages. This provides the user with a clearer picture about the command that has been selected. For instance, instead of seeing Message 1 on the display, the user could see “Tornado Warning”. Each custom message may have up to 15 characters. Remember, the space is a character. The default message, normally E-969 – Stand By Mode, may also be replaced. In this case, the custom message may be 24 characters.

As with other programmed parameters, the convention is: Type the function designation, an equal sign, the message (upper case letters are recommended), and press “Enter”. Examples are shown below.

Call Key 2 comment: CM2 = TORNADO WARNING

Remote Input 1 comment: RM1 = CHEMICAL SPILL

Time of Day 1 comment: TM1 = NOON TEST

Voice Message 8 comment: M08 = FLASH FLOOD

Default Message comment: DM1 = ANY TOWN, USA

The custom programmed comments may be displayed by typing the first four programming characters and pressing “Enter”. For example CM5= or M02=.

## **Defaults**

All of the programmable data may be erased with the Reset Encoder function, which is R= followed by “Enter” or by scrolling to the Reset Programming function and pressing Precheck.

## **Precheck**

Precheck is a Whelen High Power Voice & Siren System function which allows the user some flexibility in operating their warning system. Certain Whelen products, such as the System Status Map, use the Precheck digit to preview a command without actually activating any sirens. Refer to other hss Engineering product manuals or contact hss Engineering for additional information on the use of the Precheck function.

**NOTE:**

In the E-969 Keypad Programming mode, the Precheck key acts like a personal computer “Enter” button.

COMMAND NUMBER TABLE

00 = Cancel	31 = Voice Message 1	09 = North	0F = Silent Test
01 = Wail	32 = Voice Message 2	0A = East	1E = Test Clear
02 = Attack	33 = Voice Message 3	0B = South	39 = Strobe On
03 = Alert	34 = Voice Message 4	0C = West	3A = Strobe Off
04 = Public Address	35 = Voice Message 5	0D = Clockwise	
05 = Air Horn	36 = Voice Message 6	0E=Counter Clockwise	
06 = Hi-Lo	37 = Voice Message 7		
07 = Whoop	38 = Voice Message 8		
08 = Noon Test	3B = Voice Message 9		
	3C = Voice Message 10		
	3D = Voice Message 11		
	3E = Voice Message 12		
	11 = Voice Message 13		
	12 = Voice Message 14		
	13 = Voice Message 15		
	14 = Voice Message 16		

## **Keypad Programming**

All of the parameters discussed in the previous sections may also be programmed via the E-969 keypad, instead of a personal computer. Review the previous sections before attempting to program.

**NOTE:**

During Keypad Programming the Precheck key acts like a personal computer "Enter" button.

To enter the Keypad Programming mode, select Test & Misc. Scroll to the Program Encoder screen and press Precheck. The display will show the word "Clock". Use the Scroll arrows to select a parameter. The list of parameters are:

Clock  
Call Key  
Timed Trans. 1  
Timed Trans. 2  
Remote Input 1  
Remote Input 2  
Tmx Warm Up  
Area Code  
Base I.D.  
Precheck Digit  
Precheck Duration  
Channel Grant Wait  
Channel Grant Delay  
Reset Programming

Press Precheck after scrolling to the desired parameter to select that parameter. Not all parameters are programmed the same way. The following describes programming for each parameter.

**Clock:** First enter the day of the week. Use the numeric keys to select the day as follows: 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. Next enter the time, in military time. Enter hours first (use leading zeroes), then minutes, then seconds. Press Precheck to enter. Press Reset to return to the Stand By display.

**Call Key:** Use the numeric keypad to select the Call Key number (0-7) and press Precheck to enter. Next use the numeric keypad to select a two digit sequence number (00-99) and press Precheck to enter. Now select the command or function by using the Command Group keys and the Scroll arrows. Press Precheck when the desired function appears on the display. Use the numeric keypad to select the Address and press Precheck to enter. Finally use the numeric keypad to select a delay time (000 to 255 seconds) and press Precheck to enter. Press Precheck to save.  
Repeat for each sequence of the Call Key.

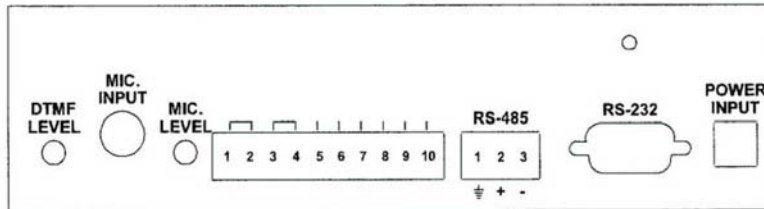
- Timed Trans. 1 or 2:** Use the numeric keypad to select the time and press Precheck to enter. Now select the command or function by using the Command Group keys and the Scroll arrows. Press Precheck when the desired function appears on the display. Use the numeric keypad to select the Address and press Precheck to enter. Finally use the numeric keypad to select the days to be skipped by this activation. As described earlier, 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. Note that the day changes to lower case if it is a skipped day. Press Precheck to enter. Press Precheck to save.
- Remote Input 1 or 2:** Select the command or function by using the Command Group keys and the Scroll arrows. Press Precheck when the desired functions appears on the display. Use the numeric keypad to select the Address and press Precheck to enter. Press Precheck to save.
- To set the Remote Input equal to a Call Key, press Call Key C1 at the command prompt. Then enter the appropriate Call Key number through the numeric keypad. Press Precheck to enter. Press Precheck to save.
- Tmx Warm Up:** Use the numeric keypad to select a value (0.0-9.9). The decimal point is fixed. Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Area Code:** Use the numeric keypad to select a value (000-999). Enter three digits. Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Base I.D.:** Use the numeric keypad to select a value (0-7). Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Precheck Digit:** Use the numeric keypad to select a value (0-9). Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Precheck Duration:** Use the numeric keypad to select a value (0-9). Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Channel Grant Wait:** Use the numeric keypad to select a value (1-9). Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Channel Grant Delay:** Use the numeric keypad to select a value (.0-.9). Press Precheck to enter. Press Reset to return to the Stand By Display or Scroll to a different parameter.
- Reset Programming:** Press Precheck to reset all of the programmable parameters.

# Installation

**NOTE:**

This step-by-step procedure for installing the E-969 is intended for use by a qualified radio technician.

1. Inspect the E-969 for any physical damage.



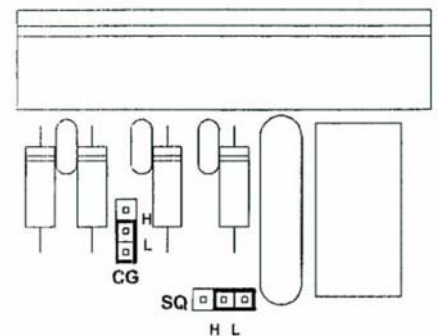
2. Look at the rear panel. From left to right are the following:

DTMF output level adjustment.  
 Microphone input jack.  
 Microphone level adjustment.  
 Input/output connector J4.  
 RS-485 connector.  
 RS-232 connector.  
 AC/DC wall adaptor power input plug.

3. Make the transceiver connections at J4, pins 1 through 6. Channel Grant applies to trunking systems only. Note that there may be more than one wire per Ground input depending on the use of the inputs. The pinouts are as follows:

<u>Pin</u>	<u>Signal</u>	
1	Push to Talk	Output
2	Push to Talk	Output
3	Audio	Output
4	Audio	Output
5	Squelch In	Input
6	Ground	
7	Channel Grant	Input
8	Remote Input 1	Input
9	Ground	
10	Remote Input 2	Input

4. The Squelch signal and the Channel Grant signal (Channel Grant is for trunking radio transceiver only) may be active high or active low. The active states must be set by two jumpers inside of the E-969. Remove four Phillips Head screws from the bottom of the unit to access the circuit board. Determine the active state of the radio transceiver Squelch signal and the Channel Grant signal (if applicable) and set the jumpers as shown to the right. Place the jumper in the "H" position for active high or "L" for active low. Factory settings are active high.



5. Ping the AC wall adaptor into a 115 volt AC source. Press the ON/OFF button to turn the E-969 on. Program the desired parameters. The DB-9 (J1) pinouts are listed below:

<u>Pin</u>	<u>Signal</u>	
2	Transmit Data	Output
3	Receive Data	Input
5,6	Ground	
7	Clear to Send	Output
8	Request to Send	Input
9	Port Connected	Input

6. Locate the recessed DTMF LEVEL and MIC VOL adjustments on the E-969. A small flat bladed screwdriver is needed for adjustment.
7. Set the DTMF Tone level. With the E-969 on, send the CANCEL Command to siren address 0001. While the tone is transmitting, adjust the DTMF LEVEL potentiometer for 2.5 KHz deviation. Repeat this step as needed to adjust the level.
8. Set the microphone level. Plug the microphone into the MIC jack. Key up the microphone and adjust the MIC VOL potentiometer for 4 KHz deviation, while speaking into the microphone.

**NOTE:**

The microphone is not included. Refer to Model WPSMIC, part #01-0245719-00.

### **Optional Automotive (or 12 VDC) Installation**

Follow the procedure as described above with the following exception at Step 4.

Instead of plugging into AC, cut the cable from the wall mount transformer or supply a cable with the appropriate plug. The white stripped wire is the positive DC lead. Connect the positive DC lead to a nominal 12 VDC source through a 1 Amp fuse. Connect the ground wire to the 12 VDC Ground. The VDC range may be 11 to 15 VDC.

## Specifications

### General –

<b>Input Power:</b>	12 volt DC nominal, 85 mA typ., 300 mA max. UL listed wall mounted transformer.
<b>Physical:</b>	Desktop design, almond color. 4.3” H x 10.0” W x 8.0” L. 1.1 pounds.
<b>Environmental:</b>	Operating temperature, 0°C to +60°C. Storage temperature, -20°C to +60°C. Humidity, 0-95%, non-condensing.
<b>Audio:</b>	2 wire, 600 $\Omega$ transformer balanced, adjustable.
<b>Control:</b>	Normally open relay for Push To Talk. Contact rating ½ A @ 120 VAC, 1 A @ 24 VDC.
<b>Signaling:</b>	DTMF format, 2 of 8, Whelen 10 digit protocol.

### Rear Panel –

<b>DTMF Tone Level:</b>	Variable, 0-4 Vpp.
<b>Microphone Volume:</b>	Variable, 0-6 Vpp.
<b>Microphone Jack:</b>	Ground, Signal, PTT.
<b>Connectors:</b>	Two part, screw terminal, Phoenix brand or equivalent.