

Model PA640
ELECTRONIC SIREN/LIGHT CONTROL



INSTALLATION, PROGRAMMING, AND OPERATING INSTRUCTIONS

LIMITED WARRANTY

The Signal Division, Federal Signal Corporation (Federal), warrants each new product to be free from defects in material and workmanship, under normal use and service, for a period of two years on parts replacement and one year on labor from the date of delivery to the first user-purchaser.

During this warranty period, the obligation of Federal is limited to repairing or replacing, as Federal may elect, any part or parts of such product which after examination by Federal discloses to be defective in material and/or workmanship.

Federal will provide warranty for any unit which is delivered, transported prepaid, to the Federal factory or designated authorized warranty service center for examination and such examination reveals a defect in material and/or workmanship.

This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor charges for removal and re-installation of the product. Lamps, flash tubes, or batteries are not covered under warranty.

This warranty does not extend to any unit which has been subjected to abuse, misuse, improper installation or which has been inadequately maintained, nor to units which have problems relating to service or modification at any facility other than the Federal factory or authorized warranty service centers.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL FEDERAL BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIAL OR WORKMANSHIP.



FEDERAL SIGNAL CORPORATION
Emergency Products

SECTION I

GENERAL DESCRIPTION



Figure 1-1. Model PA640.

The Federal Signal Model PA640 (figure 1-1) is a precision built, efficient and economical full-featured electronic siren and light control system. The siren provides wail, yelp, and priority or high-low siren tones as well as the horn ring transfer Tap II feature, public address (PA), radio rebroadcast and an air horn sound.

On-board relays in the unit allow centralized control and wiring of primary, secondary, alley lights, and auxiliary circuits with a lighted rubberized membrane switch assembly. A convenient four-position Mode slide switch allows simplified and rapid selection of most common siren and lighting functions and changes the horn ring function accordingly to provide the Tap II feature.

The unit may be installed in negative ground vehicles with 12-volt electrical systems. The siren circuits are protected against failure by user-supplied fuses. The audio power amplifier contains circuitry that protects the output transistor stages against speaker and wiring short circuits. The relay outputs are protected against failure by user-supplied fuses. No components protrude from the bottom of the siren to interfere with mounting arrangements.

A noise-canceling microphone is provided. It provides high quality voice reproduction without feedback squeal. The microphone push-to-talk switch overrides any siren sound for instant Public Address use. PA volume is adjustable by means of a front panel VOLUME control.

The PA640 is designed to drive one 11-ohm impedance, high power (100W) speaker.

The horn ring transfer feature allows the driver to change the siren sound from wail to yelp to priority/high-low to wail... via the vehicle's horn ring. This feature provides especially effective traffic clearing capability. Each slide switch position can be individually programmed for siren dependency, transfer of the

horn ring, and selection of the no siren tone to be either airhorn or peak and hold.

To reduce standby power consumption the power output audio and pre-amplifiers are not powered when not in use.

Other special features include:

- High degree of reliability is achieved through the use of a crystal controlled microprocessor, integrated circuits and silicon output transistors.
- Programmable rubberized pushbuttons with inserts. Each pushbutton can be programmed to be either: inactive, momentary, push on/push off, 8 second timer, simultaneous, or alternate flasher. The flash rate is selectable, either 75 or 120 flashes per minute. Relay pushbuttons can be attached to slide switch positions 1, 2, or 3.
- The control panel is illuminated with non-glare backlighting.
- Printed circuit boards using surface mount technology provide improved performance and durability under a wide range of environmental conditions.
- Park-Siren Deactivator can deactivate siren tones when the vehicle is shifted into PARK.
- The wail and yelp siren tones comply with SAE J1849 JUL2002 and CCR Title 13 Class 'A' specifications.
- Siren tones can be programmed to be dependent or independent of the slide switch.
- An electronic beeper chirps upon function selection. The beeper is dip switch selectable to chirp every 10 seconds if a function is active.
- The siren tones can be selected by dip switch to cut-out or coast down when deactivated.

SECTION II

SPECIFICATIONS

Input Voltage	11 Vdc to 16 Vdc
Polarity	Negative ground electrical systems only
Standby Current	0mA (ignition off) 150mA (ignition on)
Operating Current	9.25A (at 13.6V with 11-ohm load, amplifier in wait, K1,2,3 energized)
Frequency Range	750 to 1500 Hz
Cycle Rate	Wail - 12.7 cycles/min. 4.7sec/cycle Yelp - 165 cycles/min. 363mS/cycle
Voltage Output (approx.)	64V peak-to-peak
Audio Frequency Response	330 to 3000Hz \pm 3dB
Harmonic Audio Distortion	10% max. all power levels from 1/2 to 50 watts (330-3000Hz)
Operating Temperature Range	-30°C to +65°C
Dimensions (HWD)	2.75" x 6.63" x 8.00"
Net Weight	4.4 lbs.
Shipping Weight (approx.)	6.0 lbs.
Current Ratings for Relays	
Total Output	80A Combined Total all relays
Slide Switch Outputs	
Mode 1	30A
Mode 2	30A
Mode 3	30A per individual terminal 40A Combined Total for Mode 3
Pushbutton Switch Outputs	
A-F	20A Each

SECTION III

PROGRAMMING

SAFETY MESSAGE TO OPERATORS OF FEDERAL SIGNAL ELECTRONIC SIRENS AND LIGHT/SOUND SYSTEMS

WARNING

The lives of people depend on your safe operation of Federal products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Qualifications

- To properly use an electronic siren and speaker(s): you must have a good understanding of general vehicle operation, a high proficiency in the use of safety warning equipment, and thorough knowledge of state and federal UNIFORM TRAFFIC CODES.

Sound Hazards

- Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposures to very loud sounds, or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 offers guidance on "Permissible Noise Exposure."
- All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound, roll up your windows and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound. Only use the siren for emergency response situations.

Sound Limitations

- Before using the vehicle, check to see if the siren speakers are concealed from view. If the siren speaker is not in clear view on the front of the vehicle, use extra caution when operating the vehicle. A concealed siren speaker installation is less effective at warning others.
- Maximum sound output will be severely reduced if any objects are in front of the speaker. If your installation has obstructions in front of the speaker, drive even more cautiously.
- Frequently inspect the speaker to ensure that it is clear of any obstruction, such as mud or snow, which will reduce maximum sound output.

Signaling Limitations

- Be aware that the use of your visual and audible signaling devices does not give you the right to force your way through traffic. Your emergency lights, siren, and actions are REQUESTING the right-of-way.
- Although your warning system is operating properly, it may not alert everyone. People may not hear, see, or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Situations may occur which obstruct your warning signal when natural or man-made objects are between your vehicle and others. This can also occur when you raise your hood or trunk lid. If these situations occur, be especially careful.
- The LED indicators on the siren control switches simulate the light pattern(s) being executed by the warning system. The display is intended ONLY as a guide and NOT as an indication of proper warning system operation. Before using the warning system, its operation should be observed from outside the vehicle.

Driving Limitations

- At the start of your shift, you should ensure that the light/sound system is securely attached to the vehicle and operating properly.
- If the unique combination of emergency vehicle equipment installed in your vehicle has resulted in the siren controls being installed in a position that does not allow you to operate them by touch only, OPERATE CONTROLS ONLY WHILE YOUR VEHICLE IS STOPPED.
- If driving conditions require your full attention, you should avoid operating the siren controls while the vehicle is in motion.

Continuing Education

- File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees.

Failure to follow these safety precautions may result in property damage, serious injury, or death to you, to passengers, or to others.

3-1. DEFAULT CONFIGURATION.

The PA640 siren is operational right out of the box. It comes preconfigured according to the listing that follows. All operation instructions on this page are in reference to the default configuration.

Many of these functions, as well as some not listed, can be changed to meet the user's specific needs. Make sure to take the time to read through this manual to understand the full versatility of this product. All warnings and cautions that appear in the other sections of this manual also apply to information given in this section. Make sure you are aware of these warnings and cautions before you begin using this section to reconfigure the PA640 siren.

DEFAULT CONFIGURATION LISTING:

Slide Switch Position OFFOutputs 1, 2 & 3 are off.

Slide Switch Position 1Output 1 is energized.

Slide Switch Position 2Output 1 & 2 are energized.

Slide Switch Position 3Output 1, 2 & 3 are energized.

Horn Ring Transferred, enabling TAPII function.
No Siren Tone is Peak and Hold.

Rotary Switch Position PRTY..... Enabled,
Priority tone selected

Pushbutton Switch APush On /
Push Off

Pushbutton Switch BPush On /
Push Off

Pushbutton Switch CPush On /
Push Off

Pushbutton Switch DPush On /
Push Off

Pushbutton Switch EPush On /
Push Off

Pushbutton Switch FPush On /
Push Off

Audible Function Active Indicator... Chirp
disabled

Siren mode.....Standard, no
coast down.

Siren dependency.....Siren depen-
dent on slide switch 3

Pushbutton dependency.....all pushbuttons
independent of slide switch positions.

3-2. PROGRAMMING.

Two factors control how the PA640 will operate, DIP switch settings and EEPROM memory configuration. Both can be accomplished in the field with simple hand tools and the following instructions.

3-3. PREPARE UNIT FOR PROGRAMMING.

To change the operation of the PA640 proceed as follows (see figure 3-1, 3-2 and 3-3):

A. Insure all power is turned off.

B. Place slide switch in the OFF position and rotary switch in MANUAL.

C. Open unit by removing the four torx head screws holding the cover to the chassis. With the front of the siren facing you, place the relay board (mounted in cover) to the right of the amplifier board. Insure that the ribbon cable and ground cable are connecting the two PCB assemblies. (See figure 3-1.)

3-4. DIP SWITCH PROGRAMMING.

The DIP switch SW3 on the amplifier PCB assembly (see figure 3-2) is used to configure the following siren functions:

A. Audible Function Active Indicator SW3-1
ON ... A brief chirp will be heard every 10 seconds if any output function is active.
OFF ... function is disabled.

B. Siren Mode SW3-2
ON ... When turned off the siren will continue its current cycle and coast down before turning off.
OFF ... Upon deactivation the siren will shut off immediately.

C. Siren Dependency SW3-3
ON ... Rotary switch siren functions independent of slide switch programming.
OFF ... Siren functions dependent on slide switch programming.

D. EEPROM programming SW3-4
ON ... Powering up the siren with SW3-4 in the ON position will cause the siren to enter EEPROM programming mode.
OFF ... Turning SW3-4 OFF while powered up will save the current EEPROM settings. Powering up with SW3-4 OFF will begin normal siren operation.

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

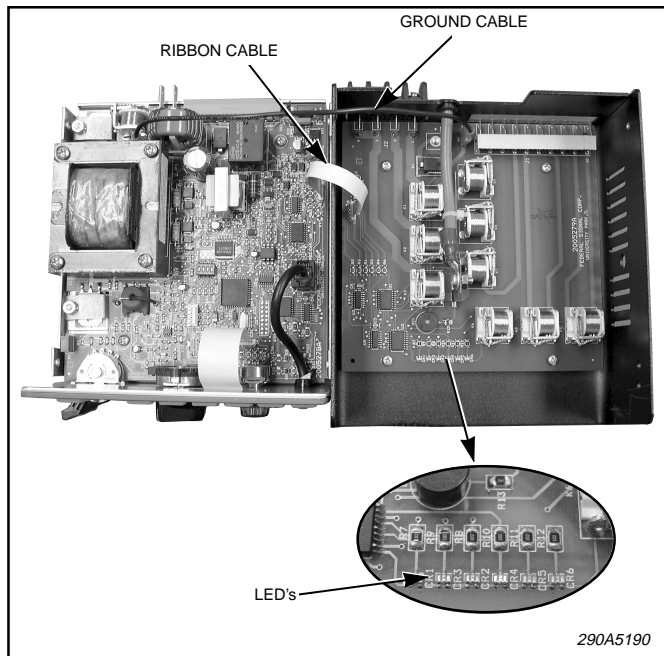


Figure 3-1.

3-5. EEPROM PROGRAMMING.

EEPROM programming allows the operation of the slide switch, rotary switch and pushbutton switches to be changed to better fit the end users requirements.

Open the siren as described in paragraph 3-3. Prepare unit for programming. Place dip switch SW3-4 in the ON position.

Turn on the power. Unit chirps. The siren is now in programming mode.

A. Pushbutton Programming.

As supplied, the pushbutton switches operate in a push-on/push-off mode. If desired, the

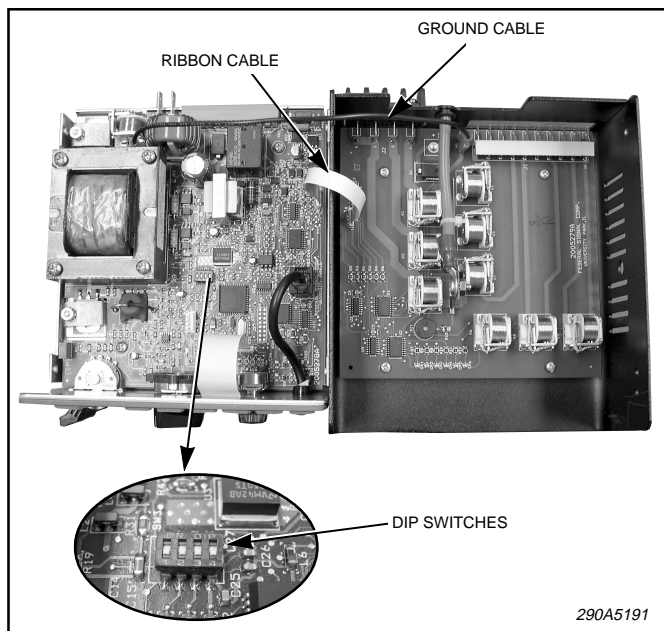


Figure 3-2.

pushbutton switches can operate in an inactive mode, momentary mode, timer mode, or simultaneous or alternating flasher mode. To change pushbutton switch operation proceed as follows (see figure 3-3):

1. If not already done, place the rotary switch in the MANUAL position and the slide switch in the OFF position.

2. Press and release the pushbutton switch you wish to program. The unit chirps and the pushbutton's LED will illuminate signifying which switch is being programmed. LED's on the relay board illuminate a code specifying how the switch is currently operating.

3. Continue to depress and release the pushbutton until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
Inactive	OFF	OFF	OFF
Momentary	ON	OFF	OFF
Push-On/Push-Off	OFF	OFF	ON
Timer	ON	OFF	ON
Flasher-A-Phase	OFF	ON	OFF
Flasher-B-Phase	ON	ON	OFF

4. Repeat steps B and C for the other pushbuttons until all pushbuttons have been programmed.

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

B. Slide Switch Off Programming.

As supplied, the slide switch OFF position operates as follows:

- The horn ring is not transferred.
- The siren is disabled if dependent on slide switch position.
- The no siren tone is Air Horn.
- Rotary switch position PRTY is enabled.
- The PRTY tone is Priority.
- Flasher set at 120 flashes per minute.

Pushbutton #7 (A/H) is used to change the operation of 1, 2 & 3. Pushbutton #8 (MAN) is used to change the operation of 4 & 5. To change slide

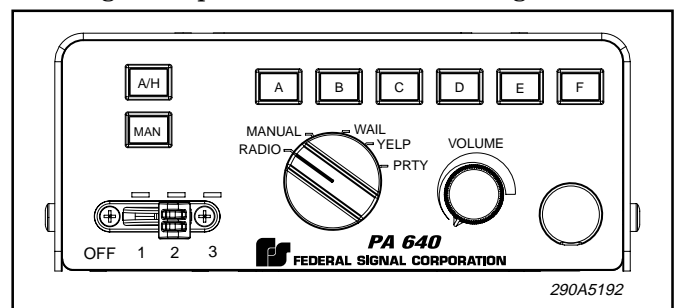


Figure 3-3. Front View.

switch OFF position operation proceed as follows (see figure 3-3):

1. If not already done, place the rotary switch in the MANUAL position and the slide switch in the OFF position.

2. Press and release pushbutton #7 (A/H) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

3. Continue to depress and release the pushbutton #7 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Horn Ring not transferred	OFF	xxx	xxx
a. Horn Ring transferred	ON	xxx	xxx
b. Siren disabled if dependent	xxx	xxx	OFF
b. Siren enabled if dependent	xxx	xxx	ON
c. No Siren Tone is Air Horn	xxx	OFF	xxx
c. No Siren Tone is Peak and Hold	xxx	ON	xxx

4. Press and release pushbutton #8 (MAN) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

5. Continue to depress and release pushbutton #8 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Rotary Switch position PRTY enabled	OFF	xxx	xxx
a. Rotary Switch position PRTY disabled	ON	xxx	xxx
b. PRTY tone is priority	xxx	xxx	OFF
b. PRTY tone is High Low	xxx	xxx	ON
c. Flashers at 120 Flashes per minute	xxx	OFF	xxx
c. Flashers at 75 Flashes per minute	xxx	ON	xxx

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

C. Slide Switch 1 Programming.

As supplied, the slide switch 1 position operates as follows:

- The horn ring is not transferred.
- The siren is disabled if dependent on slide switch position.
- The no siren tone is Air Horn.
- Relay Output #1 is active.
- No auxiliary relays are attached to slide switch 1.

Pushbutton #7 (A/H) is used to change the operation of 1, 2 & 3. Pushbutton #8 (MAN) is used to change the operation of 4 & 5. To change slide switch 1 position operation, proceed as follows (see figure 3-3):

1. Place the rotary switch is in the MANUAL position and the slide switch in the 1 position.

2. Press and release pushbutton #7 (A/H) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switch's functions are currently operating.

3. Continue to depress and release the pushbutton #7 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Horn Ring not transferred	OFF	xxx	xxx
a. Horn Ring transferred	ON	xxx	xxx
b. Siren disabled if dependent	xxx	xxx	OFF
b. Siren enabled if dependent	xxx	xxx	ON
c. No Siren Tone is Air Horn	xxx	OFF	xxx
c. No Siren Tone is Peak and Hold	xxx	ON	xxx

4. Press and release pushbutton #8 (MAN) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

5. Continue to depress and release pushbutton #8 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Relay Output #1 is inactive.	OFF	xxx	xxx
a. Relay Output #1 is active.	ON	xxx	xxx
b. Relay Output #2 is inactive.	xxx	xxx	OFF
b. Relay Output #2 is active.	xxx	xxx	ON
c. Relay Output #3 is inactive.	xxx	OFF	xxx
c. Relay Output #3 is active.	xxx	ON	xxx

6. To attach an auxiliary relay to slide switch 1, press the push button corresponding to the relay you want to attach until the LED on relay board illuminates. To release the relay, press until the LED is off.

Function:	Code:					
Pushbutton:	PB1	PB3	PB2	PB4	PB5	PB6
LED:	CR1	CR3	CR2	CR4	CR5	CR6
Relay:	K4	K6	K5	K7	K8	K9
Output:	A	C	B	D	E	F
Relay is not attached.	OFF	OFF	OFF	OFF	OFF	OFF
Relay is attached.	ON	ON	ON	ON	ON	ON

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

D. Slide Switch 2 Programming.

As supplied, the slide switch 2 position operates as follows:

- The horn ring is not transferred.
- The siren is disabled if dependent on slide switch position.
- The no siren tone is Air Horn.
- Relay Output #1 and #2 are active.
- No auxiliary relays are attached to slide switch 2.

Pushbutton #7 (A/H) is used to change the operation of 1, 2 & 3. Pushbutton #8 (MAN) is used to change the operation of 4 & 5. To change slide switch 2 position operation, proceed as follows (see figure 3-3):

1. Place the rotary switch in the MANUAL position and slide switch in the 2 position.

2. Press and release pushbutton #7 (A/H) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

3. Continue to depress and release the pushbutton #7 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Horn Ring not transferred	OFF	xxx	xxx
a. Horn Ring transferred	ON	xxx	xxx
b. Siren disabled if dependent	xxx	xxx	OFF
b. Siren enabled if dependent	xxx	xxx	ON
c. No Siren Tone is Air Horn	xxx	OFF	xxx
c. No Siren Tone is Peak and Hold	xxx	ON	xxx

4. Press and release pushbutton #8 (MAN) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

5. Continue to depress and release pushbutton #8 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Relay Output #1 is inactive.	OFF	xxx	xxx
a. Relay Output #1 is active.	ON	xxx	xxx
b. Relay Output #2 is inactive.	xxx	xxx	OFF
b. Relay Output #2 is active.	xxx	xxx	ON
c. Relay Output #3 is inactive.	xxx	OFF	xxx
c. Relay Output #3 is active.	xxx	ON	xxx

6. To attach an auxiliary relay to slide switch 2, press push button corresponding to the relay you want to attach until the LED on the relay

board illuminates. To release the relay press until the LED is off.

Function:	Code:					
Pushbutton:	PB1	PB3	PB2	PB4	PB5	PB6
LED:	CR1	CR3	CR2	CR4	CR5	CR6
Relay:	K4	K6	K5	K7	K8	K9
Output:	A	C	B	D	E	F
Relay is not attached.	OFF	OFF	OFF	OFF	OFF	OFF
Relay is attached.	ON	ON	ON	ON	ON	ON

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

E. Slide Switch 3 Programming.

As supplied, the slide switch 3 position operates as follows:

- The horn ring is transferred.
- The siren is enabled if dependent on slide switch position.
- The no siren tone is Pear and Hold.
- Relay Output #1 #2 & #3 are active.
- No auxiliary relays are attached to slide switch 3.

Pushbutton #7 (A/H) is used to change the operation of 1, 2 & 3. Pushbutton #8 (MAN) is used to change the operation of 4 & 5. To change slide switch 3 position operation proceed as follows (see figure 3-3):

1. Place the rotary switch in the MANUAL position and the slide switch in the 3 position.
2. Press and release pushbutton #7 (A/H) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switches functions are currently operating.

3. Continue to depress and release the pushbutton #7 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Horn Ring not transferred	OFF	xxx	xxx
a. Horn Ring transferred	ON	xxx	xxx
b. Siren disabled if dependent	xxx	xxx	OFF
b. Siren enabled if dependent	xxx	xxx	ON
c. No Siren Tone is Air Horn	xxx	OFF	xxx
c. No Siren Tone is Peak and Hold	xxx	ON	xxx

4. Press and release pushbutton #8 (MAN) switch. The unit chirps and the pushbutton's LED will illuminate signifying which functions are being programmed. LED's on the relay board illuminate a code specifying how the switch's functions are currently operating.

5. Continue to depress and release pushbutton #8 until the code matches the operation you wish that switch to perform.

Function:	Code:		
	CR1	CR3	CR2
a. Relay Output #1 is inactive.	OFF	xxx	xxx
a. Relay Output #1 is active.	ON	xxx	xxx
b. Relay Output #2 is inactive.	xxx	xxx	OFF
b. Relay Output #2 is active.	xxx	xxx	ON
c. Relay Output #3 is inactive.	xxx	OFF	xxx
c. Relay Output #3 is active.	xxx	ON	xxx

6. To attach an auxiliary relay to slide switch 3, press the pushbutton corresponding to relay you want to attach until the LED on the relay board illuminates. To release the relay, press until the LED is off.

Function:	Code:					
Pushbutton:	PB1	PB3	PB2	PB4	PB5	PB6
LED:	CR1	CR3	CR2	CR4	CR5	CR6
Relay:	K4	K6	K5	K7	K8	K9
Output:	A	C	B	D	E	F
Relay is not attached.	OFF	OFF	OFF	OFF	OFF	OFF
Relay is attached.	ON	ON	ON	ON	ON	ON

If programming is complete, continue to section 3-6 EXIT PROGRAMMING.

3-6. EXIT PROGRAMMING.

After programming is completed, proceed as follows:

If only DIP switch programming was performed, insure SW3-4 is in the OFF position and proceed to siren reassembly.

If EEPROM programming was performed:

- A. Place dip switch 4 in the OFF position. Unit chirps.
- B. Cycle power off then on. This can be accomplished by removing and replacing jumper J6. Unit chirps.
- C. Test unit operation.
Test **ALL** operational modes of the siren to insure that it is working properly.
- D. Reassemble the siren.

SECTION IV INSTALLATION

SAFETY MESSAGE TO INSTALLERS OF ELECTRONIC SIRENS



WARNING

The lives of people depend on your proper installation and servicing of Federal products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Before Installation

Qualifications

- To properly install an electronic siren: you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment. Always refer to the vehicle's service manuals when performing equipment installations on a vehicle.

Sound Hazards

- Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposures to very loud sounds, or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 offers guidance on "Permissible Noise Exposure."
- All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.
- Federal Signal siren amplifiers and speakers are designed to work together as a system. Combining a siren and speaker from different manufacturers may reduce the warning effectiveness of the siren system and may damage the components. You should verify or test your combination to make sure the system works together properly and meets federal, state and local standards or guidelines.

During Installation

- DO NOT get metal shavings inside the product. Metal shavings in the product can cause the system to fail. If drilling must be done near the unit, place an ESD approved cover over the unit to prevent metal shavings from entering the unit. Inspect the unit after mounting to be sure there are no shavings present in or near the unit.
- DO NOT connect this system to the vehicle battery until ALL other electrical connections are made, mounting of all components is complete, and you have verified that no shorts exist. If wiring is shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.
- Be sure the siren amplifier and speaker(s) in your installation have compatible wattage ratings.
- In order for the electronic siren to function properly, the ground connection must be made to the NEGATIVE battery terminal.

- Sound output will be severely reduced if any objects are in front of the speaker. If maximum sound output is required for your application, you should ensure that the front of the speaker is clear of any obstructions.
- Install the speaker(s) as far forward on the vehicle as possible, in a location which provides maximum signaling effectiveness and minimizes the sound reaching the vehicle's occupants. Refer to the National Institute of Justice guide 500-00 for further information.
- Mounting the speakers behind the grille will reduce the sound output and warning effectiveness of the siren system. Before mounting speakers behind the grille, make sure the vehicle operators are trained and understand that this type of installation is less effective for warning others.
- Sound propagation and warning effectiveness will be severely reduced if the speaker is not facing forward. Carefully follow the installation instructions and always install the speaker with the projector facing forward.
- DO NOT install the speaker(s) or route the speaker wires where they may interfere with the operation of air bag sensors.
- Never attempt to install aftermarket equipment, which connects to the vehicle wiring, without reviewing a vehicle wiring diagram - available from the vehicle manufacturer. Insure that your installation will not affect vehicle operation and safety functions or circuits. Always check vehicle for proper operation after installation.
- DO NOT install equipment or route wiring or cord in the deployment path of an air bag.
- Locate the siren controls so the vehicle, controls, and microphone can be operated safely.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.

After Installation

- After installation, test the siren system and light system to ensure that it is operating properly.
- Test all vehicle functions, including horn operation, vehicle safety functions and vehicle light systems, to ensure proper operation. Ensure that installation has not affected vehicle operation or changed any vehicle safety function or circuit.
- After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.
- File these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

4-1. UNPACKING.

After unpacking the Model PA640, examine it for damage that may have occurred in transit. If the equipment has been damaged, file a claim immediately with the carrier stating the extent of damage. Carefully check all envelopes shipping labels and tags before removing or destroying them.

4-2. MOUNTING BRACKET.

WARNING

When installing equipment inside air bag equipped vehicles, the installer MUST ensure that the equipment is installed ONLY in areas recommended by the vehicle manufacturer.

Failure to observe this warning will reduce the effectiveness of the air bag, damage the air bag, or potentially damage or dislodge the equipment, causing serious injury or death to you or others.

The unit comes equipped with a 'U' shaped bracket that enables it to be mounted in a variety of positions. Positioning the bracket above the unit allows mounting to the underside of a surface. Positioning the bracket below the unit will permit mounting on any horizontal surface.

The unit should be mounted in a position that is both comfortable and convenient to the operator. The mounting position must allow the vehicle, controls, and microphone to be operated safely at all times. Keep visibility and accessibility of controls in mind. To install the unit using the bracket, determine the mounting location and proceed as follows (see figure 4-1).

CAUTION

The unit must be installed in an adequately ventilated area. Never install near heater ducts.

A. Use the mounting bracket as a template and scribe two drill positioning marks at the selected mounting location.

CAUTION

Before drilling holes in ANY part of a vehicle, be sure that both sides of the mounting surface are clear of parts that could be damaged; such as brake lines, electrical wiring or other vital parts.

B. Drill two, 1/4-inch diameter holes at the position marks.

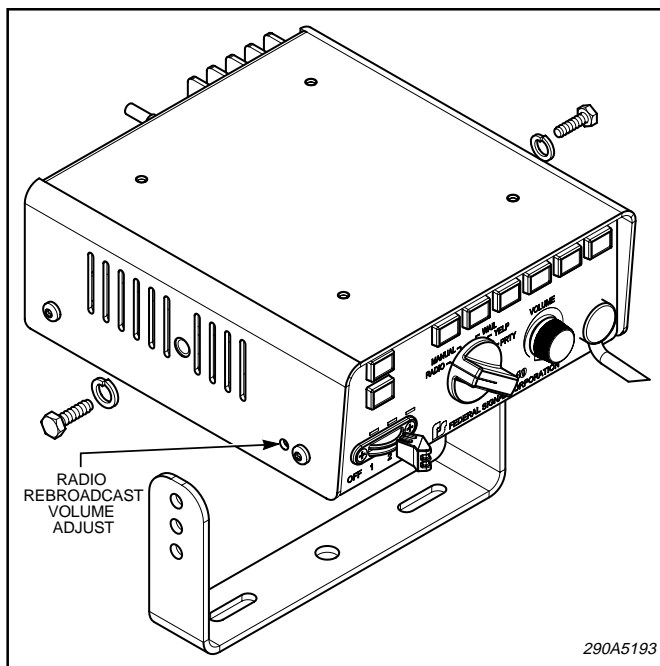


Figure 4-1.

C. Secure the mounting bracket to the surface with (2 each) 1/4-20 x 3/4 hex head screws, 1/4 split lockwashers and 1/4-20 hex nuts as shown in figure 4-1. The unit will be secured to the mounting bracket after wiring is completed.

4-3. ELECTRICAL INSTALLATION.

A. Siren Connections.

The unit is supplied with an eleven-position connector to perform the electrical installation. User-supplied 18-gauge red and black wires are required for the ignition (+) and ground (-) connections. 18-gauge wires are also required for the speaker (COM & HI), horn ring and horn, radio, park (SOL & BCM), and chassis ground connections.

To install a wire in the eleven-position connector, strip 1/4" of insulation from the end of the wire. Then insert the wire into the connector and tighten the screw at the appropriate connector position.

1. Speaker.

The unit is designed to operate with one 11-ohm impedance speaker (100W). See figure 4-2.

NOTE

If desired, the PA640 can be modified at the factory to operate with 58W speakers.

Using 18 gauge wire, connect the speaker leads to positions 10 and 11 of the eleven-position connector as shown in figure 4-2.

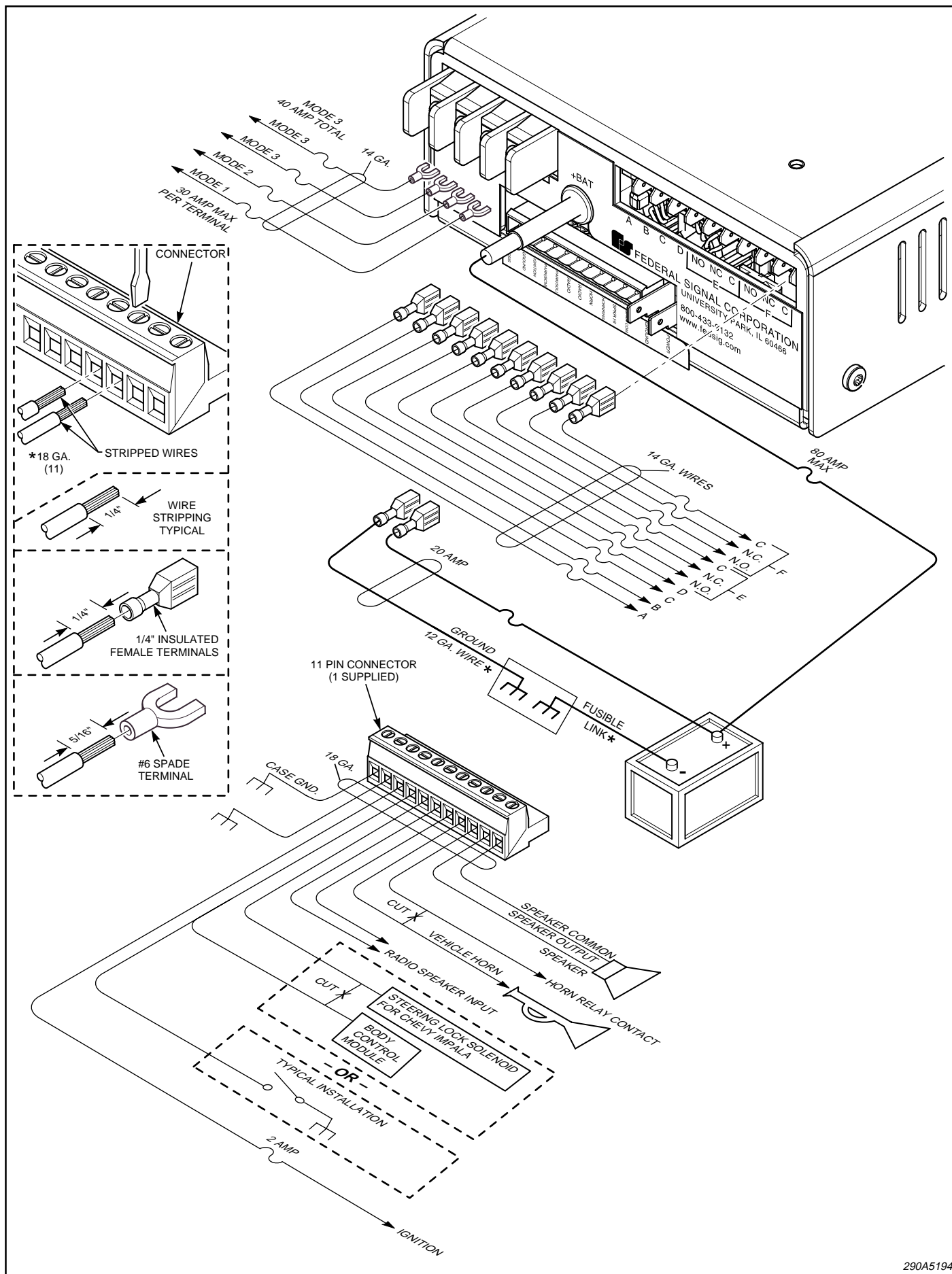


Figure 4-2.

2. Radio.

See figure 4-2. To allow incoming radio messages to be rebroadcast over the outside speakers, connect user-supplied 18 gauge wires to positions 6 and 7 of the eleven-position connector. Connect the other end of the 18 gauge wires across the two-way radio's speaker.

3. Horn Ring.

CAUTION

The horn ring transfer circuit of the siren is capable of switching a maximum of 10-amperes.

In order to utilize the horn ring transfer features of the siren, the following procedure must be performed.

- a. Locate the wire that connects the vehicle horn relay to the horn. Cut this wire.
- b. See figure 4-2. Connect a user-supplied 18 gauge wire to position 8 of the eleven-position connector. Connect the other end of the wire to the horn side of the cut wire. Insulate the connection.
- c. See figure 4-2. Connect a user-supplied 18 gauge wire to position 9 of the eleven-position connector. Connect the other end of the wire to the horn relay side of the cut wire. Insulate the connection.

4. Park-Siren Deactivator.

IMPORTANT

It is the installer's responsibility to determine an appropriate location in the vehicle circuitry to connect this wire.

This feature automatically deactivates siren tones when the vehicle is shifted into PARK.

See figure 4-2. Typical installations connect a user-supplied 18 gauge wire to position 4 (BCM) of the eleven-position connector. Connect the other end of the wire to a vehicle circuit that is GROUNDED when the vehicle is shifted into PARK. This is normally the transmission neutral safety switch. Position 5 of the eleven-position connector is not used.

WARNING

Test all vehicle functions, including horn operation, vehicle safety functions and vehicle light systems, to ensure proper operation. Ensure that installation has not affected vehicle operation or changed any vehicle safety function or circuit.

For Chevy Impala installations locate and cut the wire from the shift interlock solenoid to the Body Control Module. Connect a user-supplied 18 gauge wire to position 4 (BCM) of the eleven-position connector. Connect the other end of the wire to the Body Control Module. Connect a user-supplied 18 gauge wire to position 5 (SOL) of the eleven-position connector. Connect the other end of the wire to the Shift Interlock Solenoid.

WARNING

Test all vehicle functions, including horn operation, vehicle safety functions and vehicle light systems, to ensure proper operation. Ensure that installation has not affected vehicle operation or changed any vehicle safety function or circuit.

5. Power Source Connections.

The PA640 can operate from any 12-volt negative ground vehicle electrical system. Power for the unit can be obtained from the vehicle's power distribution center or directly from the vehicle battery. If power is going to be obtained directly from the vehicle battery, drill a hole in the vehicle firewall for the power lead to enter the engine compartment. Place a grommet or similar device in the hole to protect the wire against damage from rough edges.

Using figure 4-2 as a guide, proceed as follows:

CAUTION

Before drilling holes in ANY part of the vehicle, ensure that both sides of the surface are clear of parts that could be damaged; such as brake lines, fuel lines, electrical wiring or other vital parts.

a. Connect a user-supplied 18 gauge green wire to position 1 (case ground) of the eleven-position connector. Connect the other end of the wire to the vehicle chassis as close as practical to the unit. Scrape paint away from the selected bolt hole to ensure a good electrical connection to the chassis.

b. Connect a user-supplied 18 gauge black wire to position 2 of the eleven-position connector. Connect the other end of the wire to a common ground, located near the vehicle battery, that is connected directly to the negative battery terminal.

c. Connect a user-supplied 12 gauge black wire to the GROUND terminal. Connect the other end of the wire to a common ground, located near the vehicle battery, that is connected directly to the negative battery terminal.

CAUTION

Damage to unit will occur if not properly fused. Ensure that an in-line fuse (20A) and fuseholder are installed in the red wire connected to the POWER terminal and that an in-line fuse (2A) and fuseholder are installed in the red wire connected to position 3 of the eleven-position connector.

d. Connect a user-supplied 18 gauge red wire to position 3 of the eleven-position connector. Route the wire toward the power source. To protect the wire, use an in-line fuseholder and 2-ampere fuse (not supplied). The fuseholder should be installed as close as practical to the power source. Do not connect to the power source at this time.

e. Connect a user-supplied 12 gauge red wire to the POWER terminal. Route the wire toward the power source. To protect the wire, use an in-line fuseholder and 20-ampere fuse (not supplied). The fuseholder should be installed as close as practical to the power source. Do not connect to the power source at this time.

B. *Light Bar and Auxiliary Light Connections* (see figure 4-2).

IMPORTANT

The total combined current maximum for all outputs, 1 through 3 and A through D, must not exceed 80-amperes. Also, individual maximum current for 1 through 3 must not exceed 30-amperes per terminal, 40-amperes maximum combined in mode 3 and, individual maximum currents for A through F must not exceed 20-amperes.

The PA640 provides connections for control of light bars, auxiliary lights and accessories. A total of nine relay-controlled outputs are available.

Each output switches a nominal +12-volts to the controlled device. DO NOT use the PA640 ground circuit to ground the switched device(s). Ground each switched device SEPARATELY.

Refer to the installation instructions provided with the light bar or auxiliary light for additional precautions and details.

When connecting light bar and auxiliary light wires to the PA640, each wire must be terminated with an appropriate 1/4" female, insulated, quick-connect terminal or #6 spade or ring terminal. Complete the wiring to the light bar or accessories as follows:

1. Using a user-supplied butt connector, connect an 8 gauge red wire to the 8 gauge red wire that exits the unit. Since this wire provides the power source for all switched lighting functions, good mechanical and electrical connections are important.
2. Route the 8 gauge red wire to the power source. DO NOT make any connections to the power source until all wiring is complete.
3. To protect the 8 gauge red wire, install a user-supplied system appropriate circuit breaker of sufficient amperage (80 ampere maximum) as close as practical to the positive (+) power source terminal.
4. Connect wires from the light bar or accessories to terminals 1 through 3. Refer to the instructions supplied with the light bar or accessory for current requirement, proper wire gauge, and any additional instructions. Remember, each output can supply 30 amperes and the total combined current available is 80-amperes. Install appropriate user-supplied in-line fuses in each wire as close to the PA640 as possible.

NOTE

Output E and F are isolated from the +12-volt battery supply for switching other POSITIVE or NEGATIVE voltages. See figure 4-3.

WARNING

DO NOT connect any relay to brake light circuit of ANY vehicle.

DO NOT connect any relay to the head-light circuit of any vehicle.

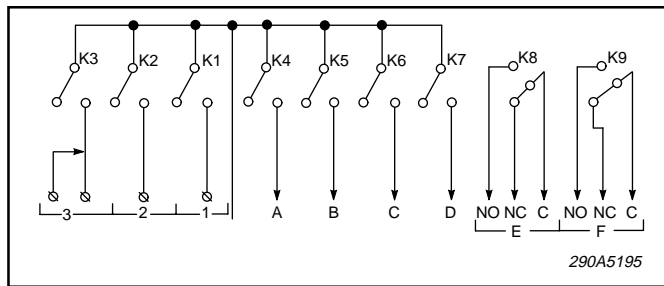


Figure 4-3.

5. Connect wires from the accessories to terminals A through F. Refer to the instructions supplied with the accessories for current requirement, proper wire gauge, and any additional instructions. Remember, each output can supply 20-amperes and the total combined current available is 80-amperes including outputs 1 through 3. Install appropriate user-supplied in-line fuses in each wire as close to the PA640 as possible.

4-4. PUSHBUTTON SWITCH OPTION.

As supplied, the pushbutton switches operate in a push-on/push-off mode. If desired, the pushbutton switches can operate in an inactive mode, momentary mode, timer mode, or simultaneous or alternating flasher mode. To change a pushbutton's operation, see Section III PROGRAMMING of this manual.

4-5. FUNCTION LABEL INSTALLATION.

See figure 4-4. Replaceable function labels identify the auxiliary switches. A sheet of applicable function legends is supplied.

To install the function legends, proceed as follows:

Select the appropriate labels from the supplied sheet of function legends. Peel the labels from the sheet and apply to the area provided in the rubberized switches.

4-6. SIREN FUNCTION SELECT.

As received from the factory, the unit produces wail, yelp, or priority tones *ONLY* if the slide switch is set to position 3. The siren tone/activation is *dependent* on the slide switch position.

If desired, the siren tones can sound immediately when the desired tone is selected with the selector switch. The siren tones can be *independent* of the slide switch position.

To change the siren tones to independent operation refer to Section III PROGRAMMING in this manual.

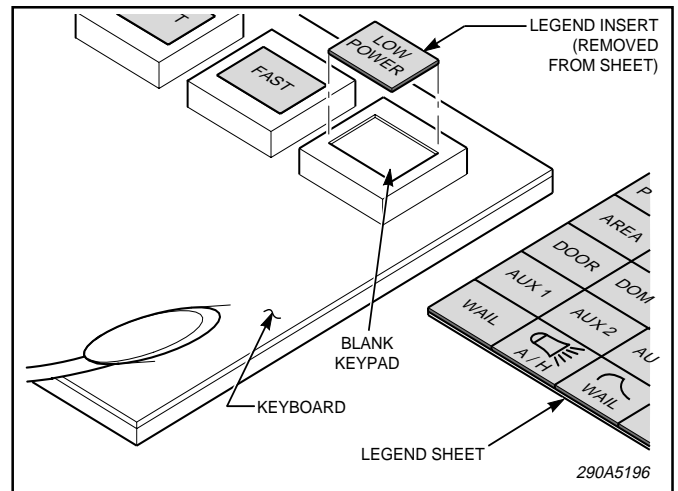


Figure 4-4.

NOTE

Inform the operator whether the siren operates dependently or independently of the slide switch.

4-7. RADIO REBROADCAST VOLUME ADJUSTMENT.

After the unit is completely installed in the vehicle, set the siren function selector switch to **RADIO**. First, adjust the radio receiver volume for a comfortable listening level inside the vehicle. Next, stand outside of the vehicle and note the radio rebroadcast loudness. If the sound volume is too loud or too soft, adjust the radio rebroadcast level control through the hole on the side of the siren (see figure 4-1) to the desired sound level.

4-8. INSPECTION AND FINAL INSTALLATION.

A. Plug the eleven-position connector into the mating connector on the unit, and apply pressure until it locks into place.

CAUTION

To avoid damage to the unit, the **BLACK** 1/4-20 x 7/16 hex head cap screws and the 1/4 split lockwashers **MUST** be used as shown in figure 4-1.

B. Secure the unit to the mounting bracket with the black 1/4-20 x 7/16 hex head screws and 1/4 split lockwashers.

C. Tilt the unit to the desired position. Tighten the 1/4-20 x 7/16 hex head screws.

D. Before connection to the power source, perform a visual check of all connections and wiring.

E. Ensure that there are no loose wire strands or other bare wire which may cause a short circuit.

Also, all wires must be protected from any sharp edges which could eventually cut through the insulation.

F. Use an ohmmeter to verify that a short circuit does NOT exist between the positive (+) leads and the vehicle chassis.

⚠ WARNING

If wires are shorted to the vehicle frame or each other, high current conductors can cause hazardous sparks resulting in electrical fires and molten metal.

Verify that no short circuits exist before connecting to the Positive (+) battery terminal.

DO NOT connect this system to the vehicle battery until ALL other electrical connections are made and mounting of all components is complete.

Failure to observe this WARNING will result in fire, burns and blindness.

G. Connect all red (+) wires to the positive (+) terminal of the power source. Secure mechanical and electrical connections are required.

4-9. WIRE MANAGEMENT.

The hardware kit for the PA640 includes cable ties and cable tie holders. These parts enable the installer to quickly and easily manage the wires that make the connections to the PA640. After installation, these components help secure the connections, greatly reducing the chance of accidental disconnection. Additionally, wires may be disconnected by simply cutting the cable tie and then rebundling with standard cable ties. To install, proceed as follows:

A. See figure 4-5. Insert the cable tie holder into one of the two .250" diameter holes provided in the back of the unit.

B. Feed a cable tie through the opening in the cable tie holder.

C. When all connections are made, route wires in a manner that allows convenient bundling with the cable tie.

D. Tighten the cable tie and trim the excess tie material.

4-10. TESTING AFTER INSTALLATION.

⚠ WARNING

All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.

After installation; test the electronic siren, including horn operation, to ensure that it is operating properly.

After testing is complete, provide a copy of this manual to all operating personnel.

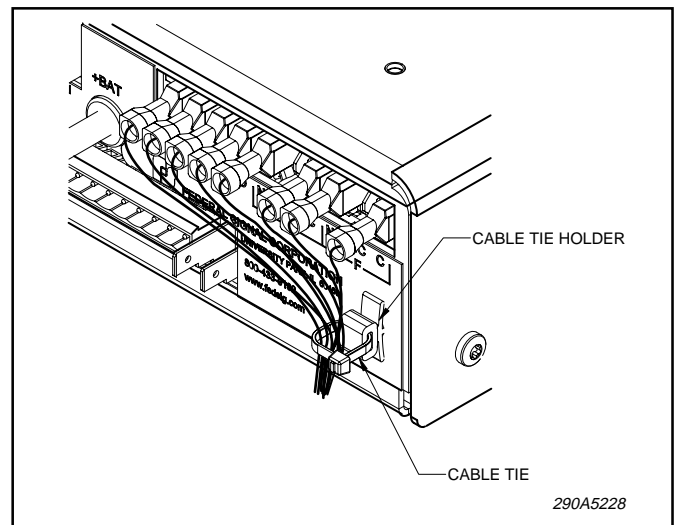


Figure 4-5.

SECTION V OPERATION

SAFETY MESSAGE TO OPERATORS OF FEDERAL SIGNAL ELECTRONIC SIRENS AND LIGHT/SOUND SYSTEMS

WARNING

The lives of people depend on your safe operation of Federal products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Qualifications

- To properly use an electronic siren and speaker(s): you must have a good understanding of general vehicle operation, a high proficiency in the use of safety warning equipment, and thorough knowledge of state and federal UNIFORM TRAFFIC CODES.

Sound Hazards

- Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposures to very loud sounds, or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 offers guidance on "Permissible Noise Exposure."
- All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound, roll up your windows and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound. Only use the siren for emergency response situations.

Sound Limitations

- Before using the vehicle, check to see if the siren speakers are concealed from view. If the siren speaker is not in clear view on the front of the vehicle, use extra caution when operating the vehicle. A concealed siren speaker installation is less effective at warning others.
- Maximum sound output will be severely reduced if any objects are in front of the speaker. If your installation has obstructions in front of the speaker, drive even more cautiously.

- Frequently inspect the speaker to ensure that it is clear of any obstruction, such as mud or snow, which will reduce maximum sound output.

Signaling Limitations

- Be aware that the use of your visual and audible signaling devices does not give you the right to force your way through traffic. Your emergency lights, siren, and actions are REQUESTING the right-of-way.
- Although your warning system is operating properly, it may not alert everyone. People may not hear, see, or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Situations may occur which obstruct your warning signal when natural or man-made objects are between your vehicle and others. This can also occur when you raise your hood or trunk lid. If these situations occur, be especially careful.

Driving Limitations

- At the start of your shift, you should ensure that the light/sound system is securely attached to the vehicle and operating properly.
- If the unique combination of emergency vehicle equipment installed in your vehicle has resulted in the siren controls being installed in a position that does not allow you to operate them by touch only, OPERATE CONTROLS ONLY WHILE YOUR VEHICLE IS STOPPED.
- If driving conditions require your full attention, you should avoid operating the siren controls while the vehicle is in motion.

Continuing Education

- File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees.

Failure to follow these safety precautions may result in property damage, serious injury, or death to you, to passengers, or to others.

5-1. GENERAL.

All controls utilized during operation of the Model PA640 are located on the front panel of the unit (see figure 5-1). They comprise:

1. A five-position rotary type siren function Selector switch.
2. A four-position mode selector slide switch.
3. Six lighted (A, B, C, D, E, F) push-on/push-off pushbuttons.
4. A public address volume control.
5. A momentary AIR HORN pushbutton switch.
6. A momentary MANUAL pushbutton switch.

The five-position rotary siren Function selector switch determines what siren sound is generated when the siren is enabled in mode 3.

NOTE

As received from the factory, the siren tones are dependent on the slide switch position.

If desired, the siren tones can sound immediately when the desired tone is selected with the selector switch. The siren tones can be independent of the slide switch position.

To change the siren tones to independent operation, see Section III PROGRAMMING in this manual.

The four-position Mode selector switch controls the operation of the warning lights and enables the siren in Mode 3. In modes OFF, 1, and 2; only the MANUAL and AIR HORN pushbutton siren sounds are available.

5-2. SIREN FUNCTION SELECTOR SWITCH.

See figure 5-1. This five-position rotary switch determines what siren function / sound is generated when the siren is enabled. This switch does not effect any light operation. The five switch positions are described below:

A. RADIO.

In this position, incoming radio messages are amplified by the siren and rebroadcast over the outside speaker.

B. MAN.

In this position, it is possible to operate the siren by activating the AIR HORN or MANUAL pushbutton switches. The siren can also be activated by means of the vehicle horn ring if the horn ring transfer relay is enabled.

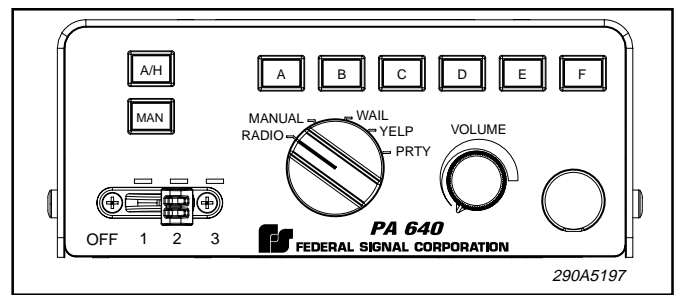


Figure 5-1.

C. WAIL.

In this position, the siren produces a continuous “wailing” sound, up and down in frequency.

D. YELP.

In this position, a continuous rapid “warbled” tone is generated.

E. PRIORITY.

In this position, a continuous extremely rapid “warbled” tone is generated.

NOTE

Pressing the microphone push-to-talk switch will override any siren sound and provide instant public address operation.

5-3. VEHICLE HORN RING SWITCH.

The horn ring transfer relay determines the function of the vehicle horn ring switch. With the siren powered off, the horn ring will operate the vehicle horn. In slide switch position OFF, 1, and 2 the horn ring is not transferred and, the horn ring will operate the vehicle horn. In slide switch position 3 the horn ring transfer relay is energized and the siren activates the Tap II function and changes the audible siren sound if the siren is active. If the siren selector switch is in the MANUAL position the peak-and-hold siren will sound.

The horn ring transfer relay operation can be programmed based on slide switch position. See slide switch programming in Section III PROGRAMMING in this manual.

5-4. AIR HORN / MANUAL SIREN PUSHBUTTON SWITCHES.

The AIR HORN pushbutton switch activates the air horn sound in any selected position. Only public address mode, the microphone’s Press To Talk switch overrides the air horn.

The MANUAL pushbutton switch activates the peak-and-hold sound in any selected position. Only

public address mode, the microphone's Press To Talk switch overrides the peak-and-hold.

5-5. VOLUME CONTROL.

The VOLUME control is used to control the volume when the siren is used for public address. Clockwise rotation of the knob increases voice volume in the public address mode. The VOLUME control does not control the volume of the siren signals or radio.

5-6. AUXILIARY PUSHBUTTONS A, B, C, D, E, AND F.

These switches are active in all modes and are illuminated when pushed 'on'. Battery power is switched 'on' to activate auxiliary devices A, B, C, D, E, and F, respectively.

5-7. PARK-SIREN DEACTIVATOR.

If installed, shifting the vehicle into PARK will silence the siren tones. Move the shift lever to another position to sound the siren tone. AIR HORN and MANUAL pushbuttons are not affected by the park-siren deactivator.

5-8. RADIO REBROADCAST VOLUME ADJUSTMENT.

If the radio rebroadcast sound volume is too loud or too soft, it can be readjusted. First, adjust the radio receiver volume for a comfortable listening level inside the vehicle. Next, use a small screwdriver and adjust the radio rebroadcast level control on the left side of the unit (see figure 4-1) to the desired sound level.

SECTION VI

SERVICE AND MAINTENANCE

SAFETY MESSAGE TO PERSONNEL SERVICING FEDERAL SIGNAL ELECTRONIC SIRENS

WARNING

The lives of people depend on your proper servicing of Federal products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other safety instructions and precautions you should follow:

- Read and understand all instructions in this manual before servicing the electronic siren or speaker.
- To properly service an electronic siren or speaker: you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment. Always refer to the vehicle's service manuals when performing service on a vehicle.
- Electronic circuit and speaker repairs must be performed by a qualified and competent electronic technician.
- Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposures to very loud sounds, or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 offers guidance on "Permissible Noise Exposure."
- All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.
- DO NOT connect this system to the positive terminal of the battery until servicing is complete, and you have verified that there are no short circuits to ground.
- In order for the electronic siren to function properly, the ground connection must be made to the NEGATIVE battery terminal.
- After repair, test the electronic siren and speaker system to ensure that it is operating properly.
- Federal Signal siren amplifiers and speakers are designed to work together as a system. Combining a siren and speaker from different manufacturers may reduce the warning effectiveness of the siren system and may damage the components. You should verify or test your combination to make sure the system works together properly and meets both federal, state and local standards or guidelines.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

6-1. GENERAL.

For warranty service, contact your local Distributor.

The factory can and will service your equipment or assist you with technical problems that cannot be handled satisfactorily and promptly locally.

Communications and shipments should be addressed to:

Service Department
Federal Signal Corporation
2645 Federal Signal Drive
University Park, IL 60466

1-800-433-9132

Copyright 2004 Federal Signal Corporation

6-2. REPLACEMENT PARTS LIST.

Description	Part No.
Chassis	8623109
Cover	8623110
Keypad	8623100
Slide Switch Knob	8536C1041
Slide Switch Bezel	8573060
Screw, Slide Switch, Flat Head	7000A259-06
Knob, Rotary Switch	141A111
Knob, Volume Control	141A102
Mounting Kit	8623113
Plug, Right Angle	140338-11
Terminal 14-16GA	224A216-04
Terminal 12-10GA	224A216-05
Terminal, Spade #6 14-16GA	224A204A-01
Screw, Mounting	7000A323-07
Lockwasher, Split	7074A015
Amplifier PCB Assembly	2005278
Relay PCB Assembly	2005279
Jumper, Flat Flex Cable	1461570-01
Microphone Assembly	258B577-03
Microphone Strain Relief	231A148
Power Cable	T300108-02-006
Power Cable Grommet	8108A014

