



# INSTALLATION AND OPERATING INSTRUCTIONS

## MS4000/MS4000U Mini-Siren



## 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

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# SECTION I GENERAL DESCRIPTION



MS4000



MS4000U

The Federal Signal MS4000 siren series is an advanced, efficient, and economical Mini-Siren. It offers value packed performance for those who do not require a full-featured siren. It provides WAIL, YELP, PRIORITY, MANUAL siren and AIR HORN functions.

This siren series incorporates the latest solid-state designs for superior reliability and sound quality plus a delayed five-second timer for override tones.

The siren is designed for use in negative grounded vehicles with 12-volt electrical systems. No components protrude from the bottom of the siren to interfere with mounting arrangements.

The MS4000U is an undercover version of the MS4000. A remote switch panel, as pictured above, allows the base unit to be mounted in a hidden location.

## Features:

- Economical small and compact - mounts virtually anywhere.
- Easy to operate – new, built-in intersection clearing feature.
- High reliability – advanced circuitry and FET design.
- 100-watt output – meets Class A with just one Federal Signal speaker.
- Output short circuit protected – replaceable fuse protection.
- Tones included – WAIL, YELP, PRIORITY, MANUAL siren (peak and hold) and AIR HORN.
- In states where the PRIORITY tone is not allowed, the JMP1 shunt can be added to eliminate the PRIORITY tone (see PRIORITY SOUND ELIMINATION, section IX, page 12).

## Applications:

- Police vehicles
- Fire chief vehicles
- Volunteer vehicles

## SECTION II SPECIFICATIONS

|                             |  |
|-----------------------------|--|
| Input voltage               | 9 Vdc to 15 Vdc  |
| Input current, operating    | 10 amps max  |
| Polarity                    | Negative grounded systems only                                   |
| Standby current             | 60mA nominal   |
| Operating temperature range | -30°C to +65°C   |
| Frequency ranges            | 725 to 1575 Hz   |
| Cycle range                 | WAIL 12 cycles/min<br>YELP 240 cycles/min<br>MANUAL 1425 Hz peak |
| Output voltage              | 64V (nominal) peak-to-peak                                       |
| Output Power                | 100 watts  |
| Output current              | 3 amps   |
| Dimensions (HWD)            | 1.3" (3.4925cm) X 6.3" (15.575cm) X 5.7" (14.478cm)              |
| Shipping Weight             | 3 lbs. (1.4kg)   |

# SECTION III

## SAFETY MESSAGE TO INSTALLERS OF FEDERAL SIGNAL LIGHT AND SOUND SYSTEMS

### WARNING

The lives of people depend on your safe 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.

##### *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 and 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, which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

#### *During Installation*

- 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.
- Be sure the siren amplifier and speaker in your installation have compatible wattage ratings.
- In order for this 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 in a location which provides maximum signaling effectiveness and minimizes the sound reaching the vehicle's occupants.
- Never attempt to install aftermarket equipment which connects to the vehicle wiring, without reviewing a vehicle wiring diagram – available from the manufacturer. Insure that your installation will not affect vehicle operation or mandated safety functions or circuits.
- DO NOT install equipment, route wiring or cord in the deployment path of an air bag.
- Locate the siren so the vehicle controls 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.
- If wiring is shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.

#### *After Installation*

- After installation, test the electronic siren and speaker system to ensure that it is operating properly.
- Test all vehicle functions, including horn operation and vehicle light systems, to ensure proper operation. Ensure that installation has not affected vehicle operation or changed any mandated 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.

# SECTION IV INSTALLATION

## 4-1 INSPECTION OF UNIT

After unpacking the MS4000 series siren, 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 PHYSICAL INSTALLATION

Both electronic sirens come equipped with two mounting brackets, which enables them to be mounted in a variety of positions. Positioning the bracket above the unit allows mounting to the underside of the dash.

The unit should be mounted in a position that is both comfortable and convenient to the operator. Keep visibility and accessibility of controls in mind. To install the unit under the dash, determine the mounting location and proceed as follows. (See figures 4-1 and 4-2).

A. Use one of the mounting brackets as a template and scribe two drill position marks at the selected mounting location under the dash, 7.0" apart. Positioning the bracket below the unit will permit mounting on any horizontal surface.

## 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.

## CAUTION

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

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 four mounting holes at the position marks.

Figure 4-1. MS4000 Mounting location

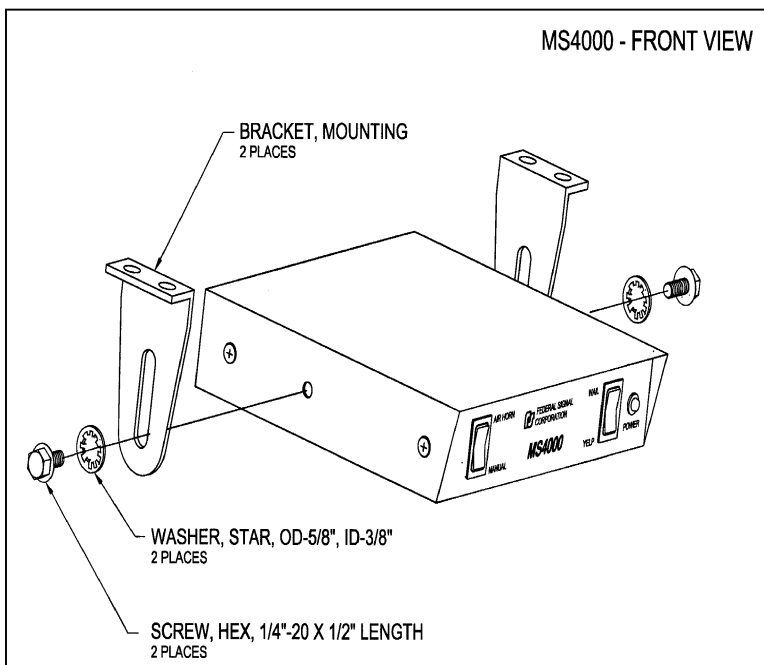
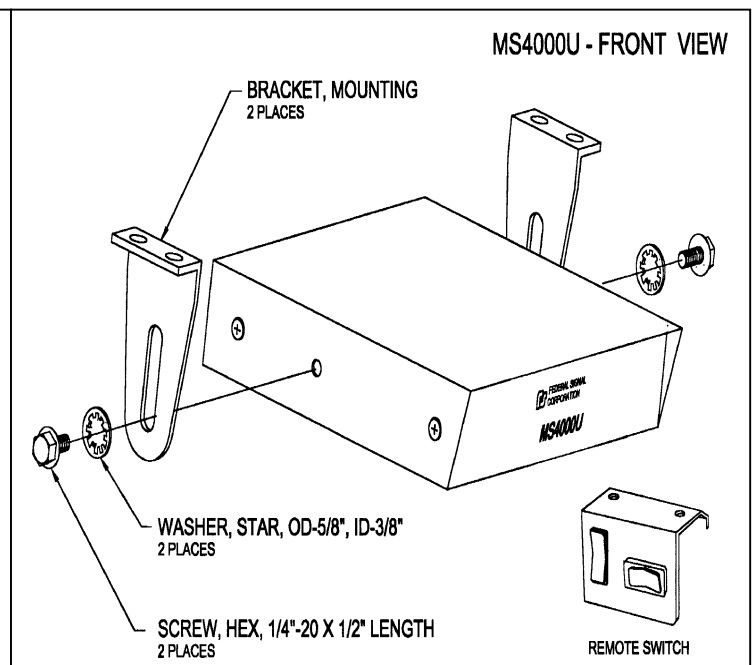


Figure 4-2. MS4000U Mounting location



C. Secure the mounting brackets to the dash with (4 each unsupplied) 10-32 x 3/4 hex head screws, 10-32 split lock washers and 10-32 hex nuts.

D. Secure the electronic siren to the mounting brackets with 1/4" self tapping machine screws and 3/8-ID" internal tooth washers (supplied).

E. Tilt the unit to the desired position. Tighten the 1/4- 20 x 3/8 hex head screws.

### 4-3 ELECTRICAL CONNECTIONS

#### WARNING

Failure to observe this WARNING may result in fire, burns or blindness.

If shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or molten metal.

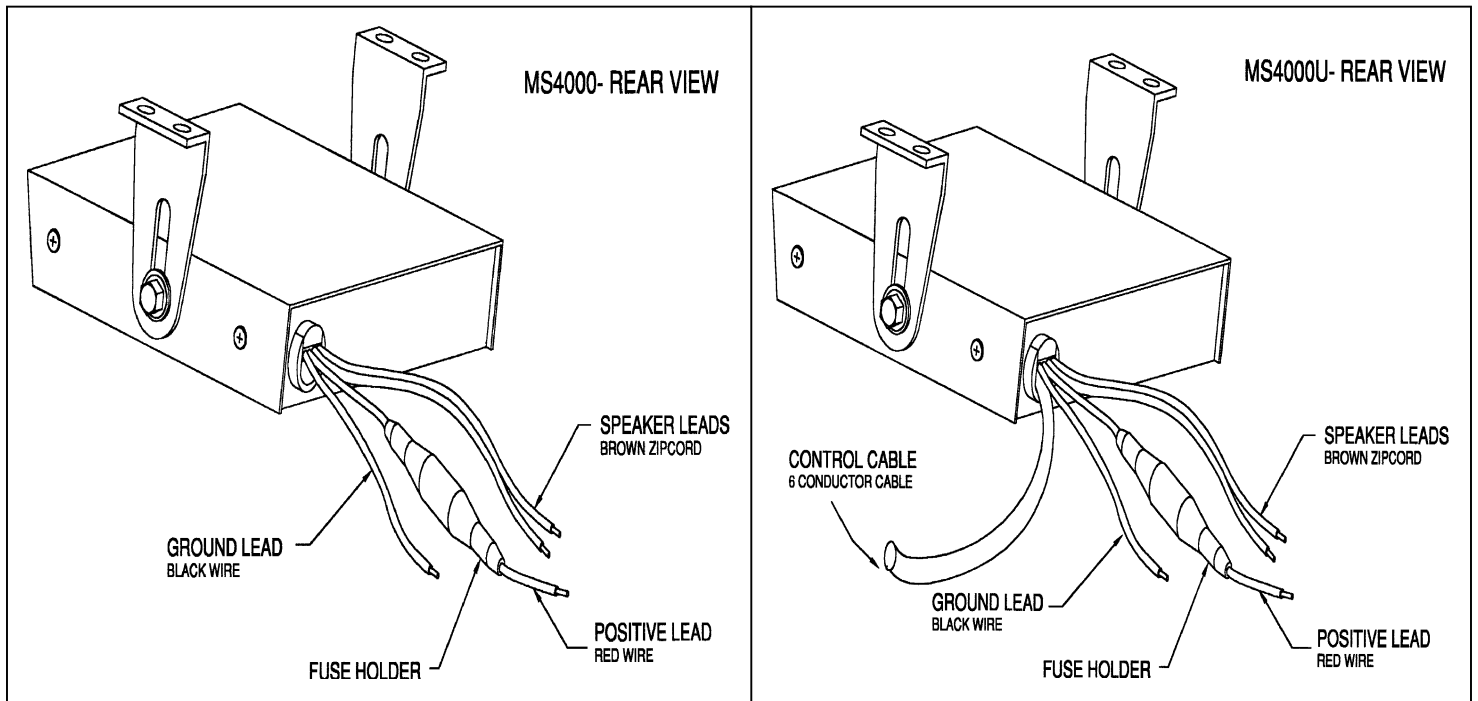
DO NOT connect this system to vehicle battery until ALL other electrical connections are made and mounting of all components is complete.

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

The power and speaker cables are included on the siren (see figures 4-3 and 4-4). The various wires must be connected as indicated below.

Figure 4-3. MS4000 Wire location

Figure 4-4. MS4000U wire location



A. *Speaker.*

The unit is designed to operate with one 11-ohm impedance speaker.

A speaker is not included as part of the electronic siren. FEDERAL speakers are weatherproof and may be installed in any convenient location; on the fender, behind the grill, etc. Any special mounting instructions applicable to the type of speaker you have selected will be found in the speaker carton.

Using 18-gauge wire, connect the speaker leads (brown zip cord) to the speaker. Ensure that exposed connections are properly insulated (see figures 4-3 and 4-4).

B. *Switch Assembly (MS4000U ONLY).*

Identify the mounting location of the MS4000U switch bracket assembly (see figure 4-5).

1. Route and install the control cable into the vehicle.

2. Trim the cable to fit the desired length. Strip the outer plastic coating of the control cable back approximately 3 inches and strip the individual wires back approximately ¼ inch.

3. Crimp the remaining end of the 5" black wire into the quick-disconnect terminal with the black wire from the control cable. Crimp the quick-disconnect terminals (provided) onto the ends of the remaining wires.

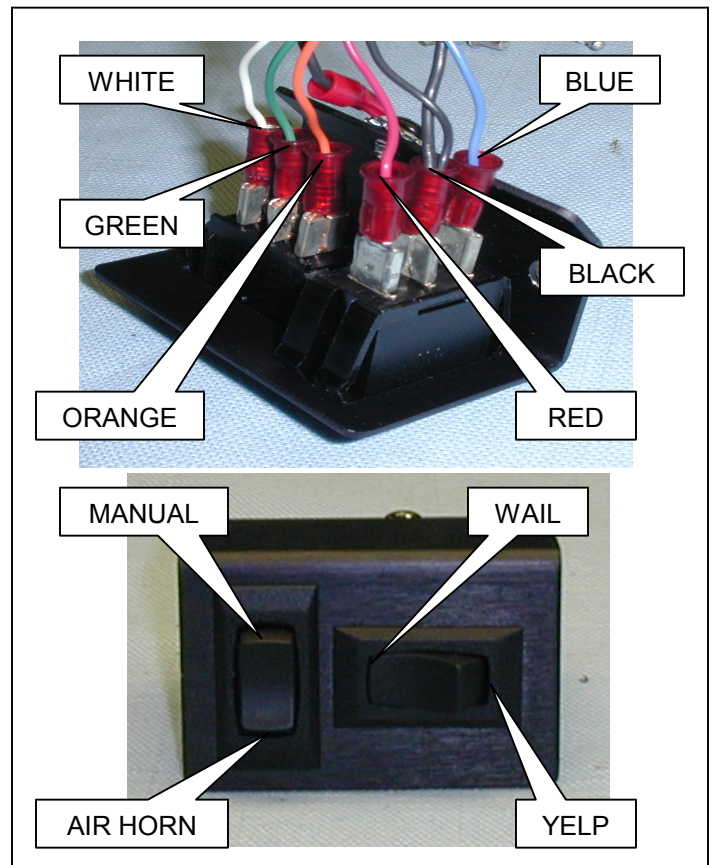
4. Using the tie wrap provided, secure the cable onto the rear of the switch bracket. **Do not cinch down at this time.**

5. Mount the switch bracket into the vehicle, in the desired location.

6. Thread the wires through the switch bracket for the desired switch configuration. Connect the quick disconnect connectors to the rear of the switches in the following manner:

- a. BLACK wire to the CENTER pole of the momentary switch.
- b. BLUE wire to the AIR HORN pole of the momentary switch.
- c. RED wire to the MANUAL pole of the momentary switch.
- d. GREEN wire to the CENTER pole of the 3-position switch.
- e. WHITE wire to the WAIL pole of the 3-position switch.
- f. ORANGE wire to the YELP pole of the 3-position switch.
- g. Snap the switches into the bracket.
- h. Tighten down the tie wrap holding the control cable.

*MS4000U Figure 4-5  
Typical wiring and switch configuration*



### C. Power Connections.

The MS4000 Siren Series can operate from any 12-volt NEGATIVE ground vehicle electrical system. Therefore, before making any electrical connections, determine the polarity of the vehicle electrical system ground.

#### **CAUTION**

The MS4000 Series Sirens do not have an on-off switch. If power is obtained directly from the vehicle battery, it will continuously draw approximately 0.060A. Since this will eventually discharge the vehicle's battery, it is recommended that the power for the system be obtained from the switched side of the ignition switch circuit.

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

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.

1. Using 14 gauge wires, route the red and black wires through the existing hole, into the engine compartment. The wires should be routed through existing clamps and holders toward the battery.

2. Connect the black lead to the vehicle battery negative (-) terminal.

3. Connect the red in-line fuse holder lead to the selected 12-volt source.

#### **4-4 TESTING AFTER INSTALLATION**

After installation, test the electronic siren to ensure that it is operating properly.

#### **CAUTION**

Damage to the unit will occur if not properly fused. Ensure that an in-line fuse (15A) and fuse holder are installed in the red power lead.

The siren is designed to blow the fuse under reverse polarity conditions. If the fuse fails when power is supplied, check and correct the power lead wiring. Install a 15A in-line fuse and reapply power.

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

# SECTION V

## SAFETY MESSAGE TO OPERATORS OF FEDERAL SIGNAL 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 which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

#### Sound Limitations

- 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 do 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, such as 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 light/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 light/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.

# SECTION VI OPERATION

## 6-1 GENERAL

All controls utilized during normal operation of the MS4000 are located on the front panel (see figure 6-1) or on the remote switch panel for the MS4000U.

Two rocker switches operate the siren. The HORN/MANUAL switch provides a momentary action while the WAIL/YELP switch locks into each position. ON/OFF/ON: With the control switches in their center positions, the siren is in standby mode (refer to Figure 6-2).

## 6-2 WAIL/YELP

Activating the siren switch in either WAIL or YELP will produce the respective siren tones. Return the switch to the center position to turn off the siren tone.



Figure 6-1. MS4000 Switch Function

## 6-3 AIR HORN/MANUAL

If the WAIL tone is selected and the MANUAL switch is depressed, a 5-second YELP tone is generated. The unit then returns to the WAIL mode (see chart in Figure 6-2).

If the YELP tone is selected and the MANUAL switch is depressed, a 5-second PRIORITY tone is generated. The unit then returns to the YELP mode.

Depressing the AIR HORN switch will interrupt the present operation of the siren with the AIR HORN tone. The AIR HORN tone is removed upon releasing the switch. The unit will return to WAIL or YELP or Standby dependent on the positioning of the WAIL/YELP switch.

With no tone selected, activation of the MANUAL switch will generate a PEAK and HOLD tone.

|             | WAIL-on                         | Off               | YELP-on                                |
|-------------|---------------------------------|-------------------|--|
| AIR HORN-ON | AIR HORN                        | AIR HORN          | AIR HORN                               |
| OFF         | WAIL                            | STANDBY           | YELP                                   |
| MANUAL-ON   | 5-sec YELP<br>Return to<br>WAIL | PEAK<br>&<br>HOLD | 5-sec<br>PRIORITY<br>Return to<br>YELP |

Figure 6-2. MS4000/MS4000U Function Chart

## SECTION VII

# SAFETY MESSAGE TO PERSONNEL SERVICING FEDERAL SIGNAL ELECTRONIC SIRENS

### WARNING

The lives of people depend on your safe servicing of 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.
- To properly service 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.
- Electronic circuit 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, which may cause, in certain situations, permanent hearing loss. You should take appropriate safety precautions such as wearing hearing protection.
- 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.

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

## SECTION VIII SERVICE

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

Servicing, other than cosmetic features, should be performed by a qualified Federal Signal service center. If the unit is not working properly, disconnect all electrical connections. Remove the unit from the mounting bracket. Send the unit to the nearest authorized service center or the Federal Signal service department.

Communications and shipments should be addressed to either service location:

Service Department:  
FS/Unitrol  
1108 Raymond Way  
Anaheim, CA 92801

714-871-3336  
1-800-854-3375

or

Service Department:  
Federal Signal  
2645 Federal Signal Dr.  
University Park, IL 60466

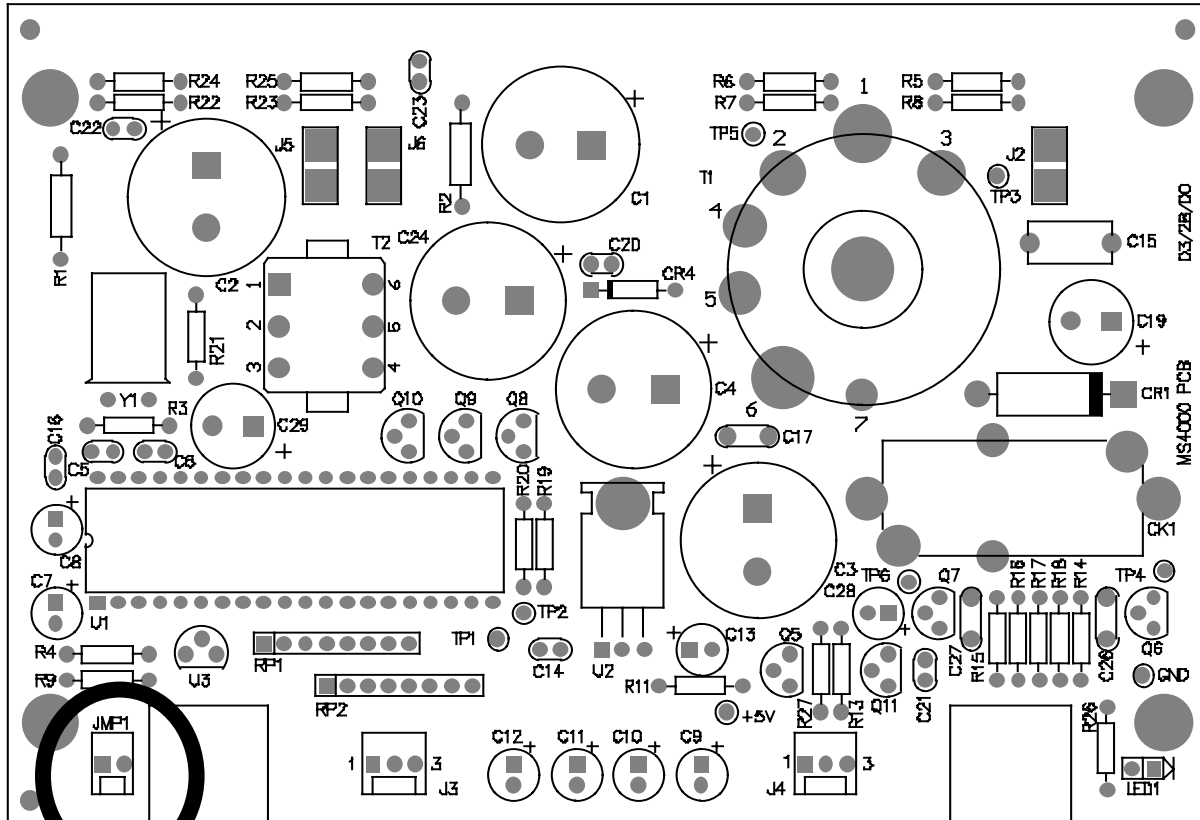
1-800-433-9132

After servicing is complete, perform a test of all functions to ensure the control unit is operating properly.

# SECTION IX

## Priority Sound Elimination

### MS4000/MS4000U



For agencies that operate in areas where the PRIORITY sounds are not authorized we are providing a shunt to be placed on the circuit board at location JMP1. If the end user installs this shunt, the unit will not produce the PRIORITY sounds.

