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**Installation Guide:
 Radio Repeat / Airhorn
 (P/N# 01-0864480-05)**

DANGER! Sirens produces extremely loud emergency warning tones! Exposure to these tones without proper and adequate hearing protection, could cause ear damage and/or hearing loss! The Occupational Safety & Health Administration (www.osha.gov) provides information necessary to determine safe exposure times in Occupational Noise Exposure Section 1910.95. Until you have determined the safe exposure times for your specific application, operators and anyone else in the immediate vicinity should be required to wear an approved hearing protection device. **FAILURE TO FOLLOW THIS RECOMMENDATION COULD CAUSE HEARING LOSS!**

Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.
- If mounting this product requires drilling holes, the installer **MUST** be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro®, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.
- Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.
- For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the **NEGATIVE (-)** battery post.
- If this product uses a remote device to activate or control this product, make sure this control is located in an area that allows both the vehicle and the control to be operated safely in any driving condition. **DO NOT ATTEMPT TO ACTIVATE OR CONTROL THIS DEVICE IN A HAZARDOUS DRIVING SITUATION.**
- It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

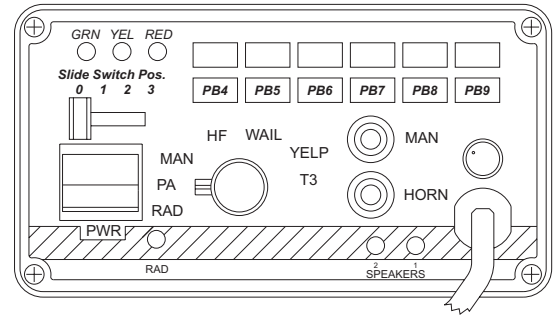
| | |
|--|---|
| ACTIVATION OF THIS SIREN MAY DAMAGE UNPROTECTED EARS! | |
|  Wear Protection! | CAUTION Loud siren noise can cause hearing damage and/or loss. Refer to OSHA Section 1910.95 prior to putting ANY siren into service! |

For warranty information regarding this product, visit www.whelen.com/warranty

READ BEFORE INSTALLING!!!

Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area.

The User/Installer assumes full responsibility to determine the proper mounting location, based on providing ultimate safety to all passengers inside the vehicle. Whelen Engineering Co. assumes no liability or responsibility for determining individual applications or exact installation location criteria.



Mounting...

An aftermarket center console is recommended for the mounting location. This not only allows the driver to reach the controls easily, but also keeps the unit safely out of the path of the vehicle's SRS air bag. Follow the console manufacturer's instructions for mounting information. If a console mounting is not possible, a bail strap mounting kit for over or under dash mounting is included. The following steps will guide you through the installation process.

Wiring...

WARNING! All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and FUSED at the battery to carry that load. DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!

Power Wires (Heavy Gage Wires)

1. Extend the 2 heavy gage RED wires along the vehicle factory wire harness towards the battery. It may be necessary to drill a hole in the firewall. If so, be absolutely sure that there are no components that could be damaged by drilling. After the hole is drilled, insert a grommet to protect the wires.
2. Install a 60 amp fuse block (user supplied) on the ends of each of these wires.

NOTE: Remove the fuse from the fuse block before connecting any wires to the battery!

3. Connect each fuse block wire to the POSITIVE (+) terminal on the battery. There must not be more than 2 feet of wire between the fuse blocks and the battery. As the wire between the fuse and the battery is "unprotected", do not allow this wire to come in contact with any other wires!

Power Wires (Input Connector)

1. Insert the Siren Input Connector into its port.
2. Connect the 2 RED wires together and extend them toward the battery. Repeat for the 2 BLACK wires.
3. Install a 20 amp fuse block (user supplied) on the end of the RED wire from the siren connector.

NOTE: Remove fuse from fuse block before connecting any wires to the battery!

4. Connect the fuse block wire to the POSITIVE (+) terminal on the battery. There must not be more than 2 feet of wire between the fuse block and the battery. As the wire between the fuse and the battery is "unprotected." Do not allow this wire to come in contact with any other wires!
5. Connect the BLACK wire to the factory chassis ground typically adjacent to the battery.

Speaker Wires (Yellow, Orange & Brown Wires)

NOTE: This section outlines a two-speaker installation. If a one-speaker installation is used, cut and cap the ORANGE wire, skip steps 3 & 4.

1. Extend the YELLOW, ORANGE and BROWN wires to the vehicle siren speakers and connect as follows.
2. SPEAKER 1 -YELLOW wire to the POSITIVE speaker connection and BROWN to the NEGATIVE speaker connection.
3. SPEAKER 2 - ORANGE wire to the POSITIVE speaker connection.
4. Splice a wire from the NEGATIVE speaker connection on SPEAKER 1 to the NEGATIVE speaker connection on SPEAKER 2.

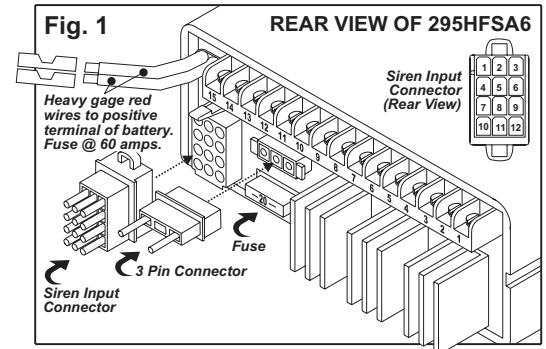
Radio Rebroadcast (Blue Wire (Optional))

NOTE: Radio rebroadcast will NOT work with amplified remote speakers! If your remote speaker is amplified (contains a power amp circuit in the speaker assembly), do not enable the radio rebroadcast feature.

1. Locate the two wires that connect the external speaker to the vehicle's two-way radio.
2. Cut one of these wires and splice one of the BLUE wires into this circuit.
3. Cut the remaining speaker wire and splice the remaining BLUE wire into this circuit.

Backlight (White/Yellow wire):

Connect this wire to a +12VDC source that is activated with the vehicle's ignition switch (see wiring diagram).



| SIREN INPUT CONNECTOR | | |
|-----------------------|--------------|-------------|
| PIN | COLOR & GAGE | FUNCTION |
| 1 | RED 14GA | + BATTERY |
| 2 | BLACK 14GA | GROUND |
| 3 | BLUE 18GA | RADIO |
| 4 | RED 14GA | + BATTERY |
| 5 | BLACK 14GA | GROUND |
| 6 | BLUE 18GA | RADIO |
| 7 | BROWN 16GA | SPEAKER COM |
| 8 | ORANGE 16GA | +SPEAKER #2 |
| 9 | VIOLET 18GA | Not Used |
| 10 | GREY 18GA | Not Used |
| 11 | WHITE 18GA | Not Used |
| 12 | YELLOW 16GA | +SPEAKER #1 |

Terminal Operation...

The unit contains 15 screw terminals located in the upper rear panel of the housing. These terminals have been designed to activate components that do not exceed specific load ratings (current draw). It is important that any components connected to these terminals do not exceed the maximum current rating for that terminal. The terminals are rated as follows:

| Terminal #'s | Max. Load | Fuse Designation |
|--------------|-----------------|------------------|
| #1 | 20 Amps | F1 |
| #2 | 20 Amps | F2 |
| #3, #4 & #5* | 20 Amps (Total) | F3 |
| #6 | 10 Amps | F4 |
| #7 | 10 Amps | F5 |
| #8 | 10 Amps | F6 |
| #9 | 10 Amps | F7 |
| #11** | 10 Amps | |
| #12 | 10 Amps | F8/F8A |
| #14** | 10 Amps | |
| #15 | 10 Amps | F9/F9A |

* Terminals #3, #4 & #5 can not be individually activated.

** Terminals 11 & 14 are always on unless otherwise noted.

Dip Switches...

In the default dip switch/fuse configuration the terminal outputs are enabled as follows:

Slide Switch Positions -

- 0 = Terminals OFF
- 1 = Terminal #1 ON
- 2 = Terminals #1 & 2 ON
- 3 = Terminals #1, 2, 3, 4 & 5 ON

Push-button Switches -

- 4 = Terminal #6 ON
- 5 = Terminal #7 ON
- 6 = Terminal #8 ON
- 7 = Terminal #9 ON
- 8 = Terminal #12 ON / Terminal #11 OFF
- 9 = Terminal #15 ON / Terminal #14 OFF

See the "Custom Dip Switch Configurations" section for information on changing default terminal control

Custom Dip Switch Configurations (Bank 1):

Slide Switch Functionality

In the default configuration the slide switch controls terminals 1 thru 5 (see the *Terminal Specifications* section for details). This configuration can be altered so that any combination of these five terminals may be active or inactive in any of the 3 functioning slide switch positions. The slide switch configurations are controlled by a dip switch bank which is located on the top circuit board. Access is gained by removing 4 Torx-head screws located at the 4 corners of the face plate. With these screws removed, slide the chassis housing cover towards the rear of the unit. It is not necessary to slide this cover more than a few inches, as the dip switch banks are located behind the control panel.

To help illustrate how to change default slide switch control, the following will outline how configure the slide switch so that in position 2, only terminal 2 is enabled, while position 3 will only enable terminal 3.

SLIDE SWITCH POSITION 1 is controlled by dip switches 1, 2 & 3 on bank 1. Dip switch 1 (which controls Terminal 1) is in the on position, while dip switch 2 (which controls Terminal 2) & dip switch 3 (which controls Terminals 3, 4 & 5) are in the off position. This means that when the slide switch is in position 1, Terminal 1 alone becomes active.

SLIDE SWITCH POSITION 2 is controlled by dip switches 4, 5 & 6 on bank 1. Dip switch 4 (Terminal 1) is off, dip switch 5 (Terminal 2) is on and dip switch 6 (Terminals 3, 4 & 5) is off. This means that when the slide switch is moved to position #2, Terminal 2 alone is active, while Terminals 1, 3, 4 & 5 are inactive.

SLIDE SWITCH POSITION 3 is controlled by dip switches 7, 8 & 9 on bank 1. Dip switch 7 (Terminal 1) is off, dip switch 8 (Terminal 2) is off and dip switch 9 (Terminals 3, 4 & 5) is on. This means that when the slide switch is moved to position 3, Terminals #3, 4 & 5 are active, while Terminals 1 & 2 are inactive.

Enabling Siren Tones through Slide Switch Position #3: Slide switch position 3 can be configured to automatically activate siren tones, as described in *Rotary Switch Operations*. If this is not desired, make sure that Dip Switch 1 on Bank 2 is in the OFF position. Please note that siren activation through Slide Switch Position 3 is only available when the power switch is in the ON position.

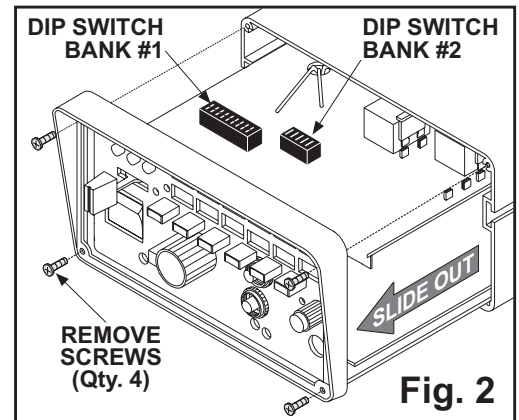


Fig. 2

DIP SWITCH CHART / DEFAULT POSITION

The side of the dip switch that is depressed is indicated as black.

| Slide Switch | SLIDE SWITCH POSITION #1 | | | SLIDE SWITCH POSITION #2 | | | SLIDE SWITCH POSITION #3 | | |
|----------------------------|--------------------------|---|---|--------------------------|---|---|--------------------------|---|---|
| ON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| OFF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Output Terminals Activated | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | | | 4 | | | 4 | | | 4 |
| | | | 5 | | | 5 | | | 5 |

DIP SWITCH CHART (Modified for example)

The side of the dip switch that is depressed is indicated as black.

| Slide Switch | SLIDE SWITCH POSITION #1 | | | SLIDE SWITCH POSITION #2 | | | SLIDE SWITCH POSITION #3 | | |
|----------------------------|--------------------------|---|---|--------------------------|---|---|--------------------------|---|---|
| ON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| OFF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Output Terminals Activated | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | | | 4 | | | 4 | | | 4 |
| | | | 5 | | | 5 | | | 5 |

Custom Dip Switch Configurations (Bank 2):

Push-button 9 (a momentary-type switch) has the ability to function in four different modes. These modes are defined by the five-position dip switch (Bank 2).

Mode 1 (default) - In this configuration, the output is activated for as long as push-button 9 is depressed.

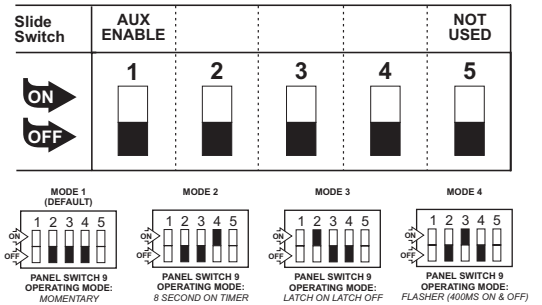
Mode 2 - In this configuration, when push-button 9 is pressed, the output is activated for a period of 8 seconds.

Mode 3 - In this configuration, when push-button 9 is pressed, the output is activated. When pressed again, the output is deactivated.

Mode 4 - In this configuration, when push-button 9 is pressed, the output is activated for a period of 400 ms. After 400 ms, the output is deactivated for 400 ms. This cycle will continue until push-button 9 is pressed again.

DIP SWITCH CHART / 5 POSITION / BANK 2

Dip Switches are shown below in their default (factory) setting. The side of the dip switch that is depressed is indicated as black.



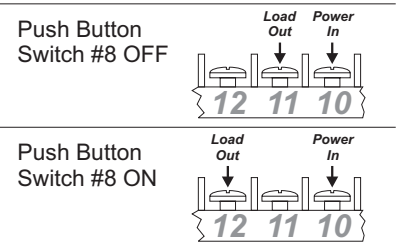
Custom Fuse Configurations: Push-buttons 8 & 9 Functionality

Terminals #10 & 13 do not function as output terminals and are not used in the default configuration. By changing the positions of specific fuses, these terminals can be configured to control auxiliary circuits. These auxiliary circuits can not exceed 10 amps each.

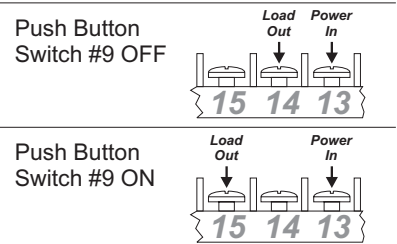
Moving Fuse #8 from its default position (F8) to its optional position (F8A) allows push-button 8 to control an auxiliary circuit. Connect *Power In* from the aux. circuit to Terminal #10 and *Load Out* to Terminal #12. Push-button 8 will now open and close this circuit.

Moving Fuse #9 from its default position (F9) to its optional position (F9A) allows push-button 9 to control an auxiliary circuit. Connect *Power In* from the aux. circuit to Terminal #13 and *Load Out* to Terminal #15. Push-button 9 will now open and close this circuit.

Fuse F8 moved to F8A position



Fuse F9 moved to F9A position



Backlighting

Backlighting for the six push-buttons may be controlled in one of two manners: In the default (as shipped) mode, the 3-position connector controls the backlighting. The WHITE/YELLOW wire may be connected to a 12VDC source that is activated with the vehicle's ignition switch. For vehicles utilizing a battery disconnect switch an internal jumper may be moved, allowing the backlighting to be controlled by power applied to the number 10 AWG input wires, saving an additional connection.

Diagnostic Indicators

The unit has two diagnostic indicators on the front panel which are used to indicate fault conditions with your siren system. The following table lists the type of fault and the indicators response. If the indicator is on steady while a tone is in use, this implies that there is no fault with the associated speaker output.

Fault Condition and Diagnostic Indicators Response

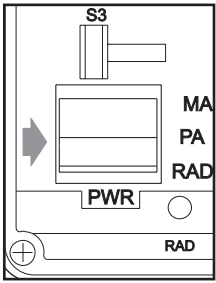
Over Voltage -

Speaker LED #1 will be in a DoubleFlash mode (2 quick flashes followed by a pause).

Under Voltage -

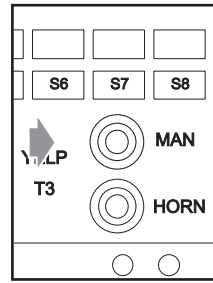
Speaker LED #2 will be in a DoubleFlash mode (2 quick flashes followed by a pause).

Control Head Component Identification:



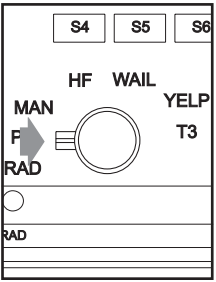
POWER SWITCH

This switch has two positions: Down (Off) & Up (On). When this switch is Off, the unit will not function. When the switch is On, the siren is functional and may be activated at the operator's discretion.



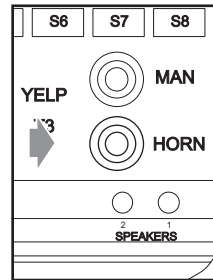
MAN BUTTON

The Manual button is not used.



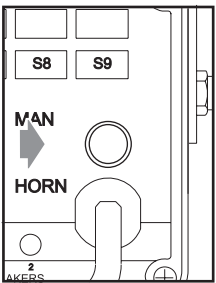
ROTARY SWITCH

The Rotary Knob controls the Radio Repeat and PA (Public Address) functions of the unit.



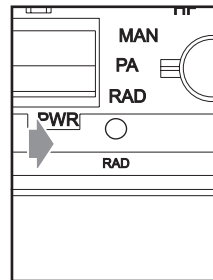
HORN BUTTON

The HORN button is not used.



VOLUME KNOB

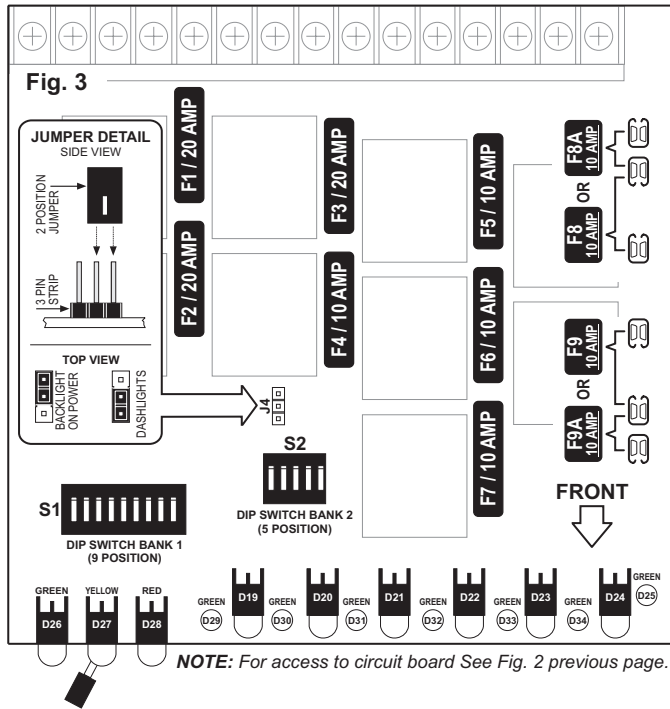
The Volume Knob controls the volume of Public Address function. Volume is increased by rotating the knob in a clockwise direction. Rotating the volume knob in a counter-clockwise direction decreases the volume produced by these features.



RADIO REPEAT VOLUME

Before use, the Radio Repeat output volume must be adjusted to satisfactory operating levels. To adjust this level, a small, flat-blade screwdriver is needed. Locate the Radio Repeat adjustment port (potentiometer) to the right of the Rotary Knob on the face of the control head. Set the volume level of the vehicle's two-way radio to its normal operating volume. Turn the Rotary Knob on the control head to RAD to activate Radio Repeat. Insert the screwdriver in the Radio Repeat adjustment port and turn in clockwise direction to increase the sound level.

UPPER CIRCUIT BOARD: Fuse, Jumper and Dip Switch Identification



Rotary Switch Operations:

RAD (Radio Repeat) - When the rotary knob is in the RAD position, any signal that is received by the vehicle's two-way radio will be simultaneously broadcast over the vehicle's loudspeaker (the unit must be connected to the two-way radio as outlined in this manual).

When the rotary switch is in any other position, the siren is in a standby state where no tones have been activated, but is waiting for another action to be taken by the operator. These positions are the best choice when public address is required.

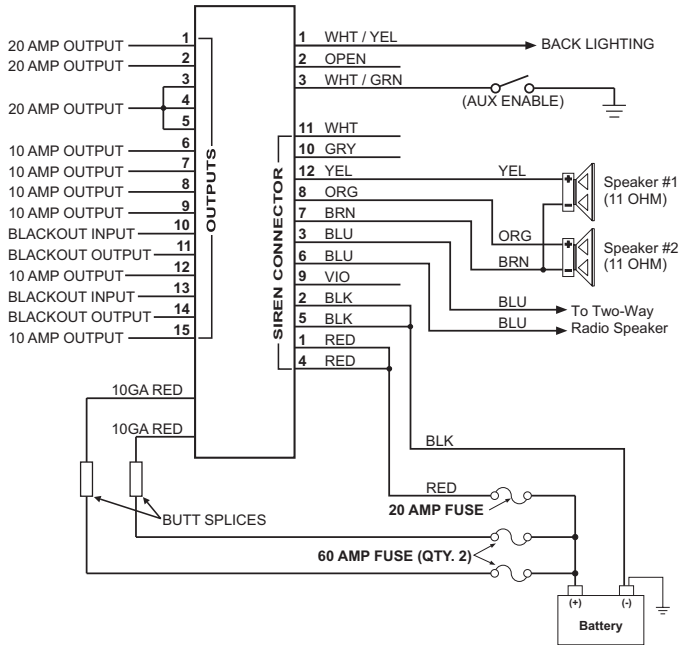
Microphone

Whenever the unit is powered on, activating the microphone (pressing the switch on the side of the mic.) will shut down any other siren functions and enable public address operation regardless of the rotary switch position or any other switch or input.

295HFSA6 Specifications

- INPUT VOLTAGE 12.5 VDC ±20%
- INPUT CURRENT @15 VDC @ 5.5 OHMS 16 AMPS MAX.
- INPUT FUSE 20 AMPS
- SPEAKER IMPEDANCE..... 5.5 OHMS MIN.
- OPERATING TEMPERATURE -30° C. TO +60° C.
- STORAGE TEMPERATURE..... -40° C. TO +70° C.
- HUMIDITY 99% (NON CONDENSING)
- OUTPUT VOLTAGE @ 15 VDC @ 11 OHMS..... 32 V RMS MAX.
- OUTPUT POWER @ 15 VDC @ 11 OHMS 105 WATTS MAX.
- OUTPUT POWER @ 15VDC @ 11 OHMS 185 WATTS MAX.

WIRING DIAGRAM



Recommended Sizes for Customer Supplied Wires:

- Switch Power**
- 10 AWG 8 FT. MAX
 - 8 AWG 13 FT. MAX
 - 6 AWG 21 FT. MAX
- Siren Power & Ground**
- 12 AWG 18 FT. MAX
 - 10 AWG 30 FT. MAX

ACTIVATION OF THIS SIREN MAY DAMAGE UNPROTECTED EARS!



Wear Protection!

! CAUTION

Loud siren noise can cause hearing damage and/or loss. Refer to OSHA Section 1910.95 prior to putting ANY siren into service!