

WHELEN[®] ENGINEERING COMPANY INC.

51 Winthrop Road
 Chester, Connecticut 06412-0684
 Phone: (860) 526-9504
 Fax: (860) 526-4078
 Internet: www.whelen.com
 Sales e-mail: autosale@whelen.com
 Canadian Sales e-mail: autocan@whelen.com
 Customer Service e-mail: custserv@whelen.com

Installation Guide:
Siren/Power Control Center
Model(s) 295HFSA5
295HF5M5

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!



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

WARNING!

DISCONNECTING THE VEHICLE BRAKE LAMP CIRCUIT USING ANY SIRENS WITH RELAY OUTPUTS OR SWITCH CONTROLLERS COULD CAUSE VEHICLE OR PROPERTY DAMAGE, SERIOUS INJURY OR EVEN DEATH.

DISABLING THIS CIRCUIT IS A VIOLATION OF THE FEDERAL MOTOR VEHICLE SAFETY STANDARD FOR THE THIRD BRAKE LIGHT, AS WELL AS REAR BRAKE LIGHTS.

FUNCTIONS THAT BLACK OUT THE REAR BRAKE LIGHTS (SOMETIMES CALLED “BRAKE LIGHT CUT OUT”) MAY INTERFERE WITH THE BRAKE SHIFT LOCK MECHANISM, AND CAUSE THE VEHICLE TO MOVE UNEXPECTEDLY AND DANGEROUSLY.

DISCONNECTING THE BRAKE LIGHTS IN ANY WAY IS AT YOUR OWN RISK AND IS NOT RECOMMENDED BY WHELEN.

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. If console mounting is not possible, the unit includes a bail strap mounting kit for over or under dash mounting.

Wiring the 295HFS_5 (refer to wiring diagram on pg. 6):

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! (see customer wire chart)

Power Wires

1. Insert the Siren Input Connector (P4) into its port.
2. Splice the 2 RED wires together, then extend this single RED wire to the battery. Install a 20 amp fuse block (customer supplied) to the end of the wire and connect it to the POSITIVE (+) terminal on the battery (remove the fuse before connecting any wires to the battery).

IMPORTANT: There must not be more than 2 feet of wire between the fuse block and the battery. The wire between the fuse and the battery is "unprotected." Do not allow this wire to come in contact with other wires.

3. Splice the 2 BLACK wires together and connect them to the negative terminal of the battery.
4. Run the RED wire from Output P1 to the battery and connect it to a 3 Amp fuse block, (customer supplied) then to the positive terminal of the battery.

Speaker Wires / Yellow, Orange & Brown Wires

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

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

Slide Switch Control Wires / Green, Grey & Blue

NOTE: The push-button and slide switch control wires are designed to activate relays with a coil rating no greater than 250 ma. Do not connect them to any circuit rated higher.

1. Route and connect the GREEN wire to the desired lightbar function control wire(s).
2. Route and connect the GREY wire to the desired lightbar function control wire(s).
3. Route and connect the BLUE wire to the desired lightbar function control wire(s).

Horn Relay Wires / White & Grey Wires

1. Run the WHITE and GREY wires to the vehicle's horn relay. If possible, follow the factory wire harness.
2. Cut the wire that connects the vehicle horn to the horn relay.
3. Connect WHITE wire to wire coming from horn relay.
4. Connect GREY wire to wire coming from horn.

Radio Rebroadcast / Blue Wires (Optional)

Radio rebroadcast will NOT work with amplified speakers. If your remote speaker contains a power amp in the speaker, do not enable the radio re-roadcast feature.

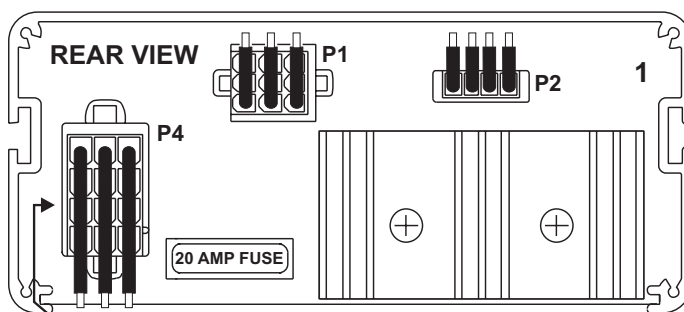
1. Locate the two wires that connect the external speaker to the vehicle's two-way radio.
2. Cut one of these wires and splice one of the BLUE wires into this circuit.
3. Cut the remaining speaker wire and splice the remaining BLUE wire into this circuit.

Siren Shut-Down / Violet Wire (Optional)

The 295HFS5A5 can be configured to cease all automatic siren tones whenever the VIOLET wire from P4 is grounded through a switch. If this is not desired, cut and cap the VIOLET wire.

Backlighting

When the power switch is on, the HFS5A5's backlighting is on. When the power switch is off, backlighting can be turned on by connecting the WHITE / RED wire from P2 to a +12VDC source that is activated with the vehicle's ignition switch.



12 POSITION SIREN INPUT CONNECTOR					
PIN #	COLOR & GAGE	FUNCTION	PIN #	COLOR & GAGE	FUNCTION
1	RED 14GA	+ BATTERY	7	BROWN 16GA	SPEAKER COM
2	BLACK 14GA	GROUND	8	ORANGE 16GA	+SPEAKER #2
3	BLUE 18GA	RADIO	9	VIOLET 18GA	REMOTE ACT.
4	RED 14GA	+ BATTERY	10	GRAY 18GA	HORN
5	BLACK 14GA	GROUND	11	WHITE 18GA	HORN/RING
6	BLUE 18GA	RADIO	12	YELLOW 16GA	+SPEAKER #1

Configuring the Slide Switch Functions:
 In the default dip switch setting, the P1 outputs are:

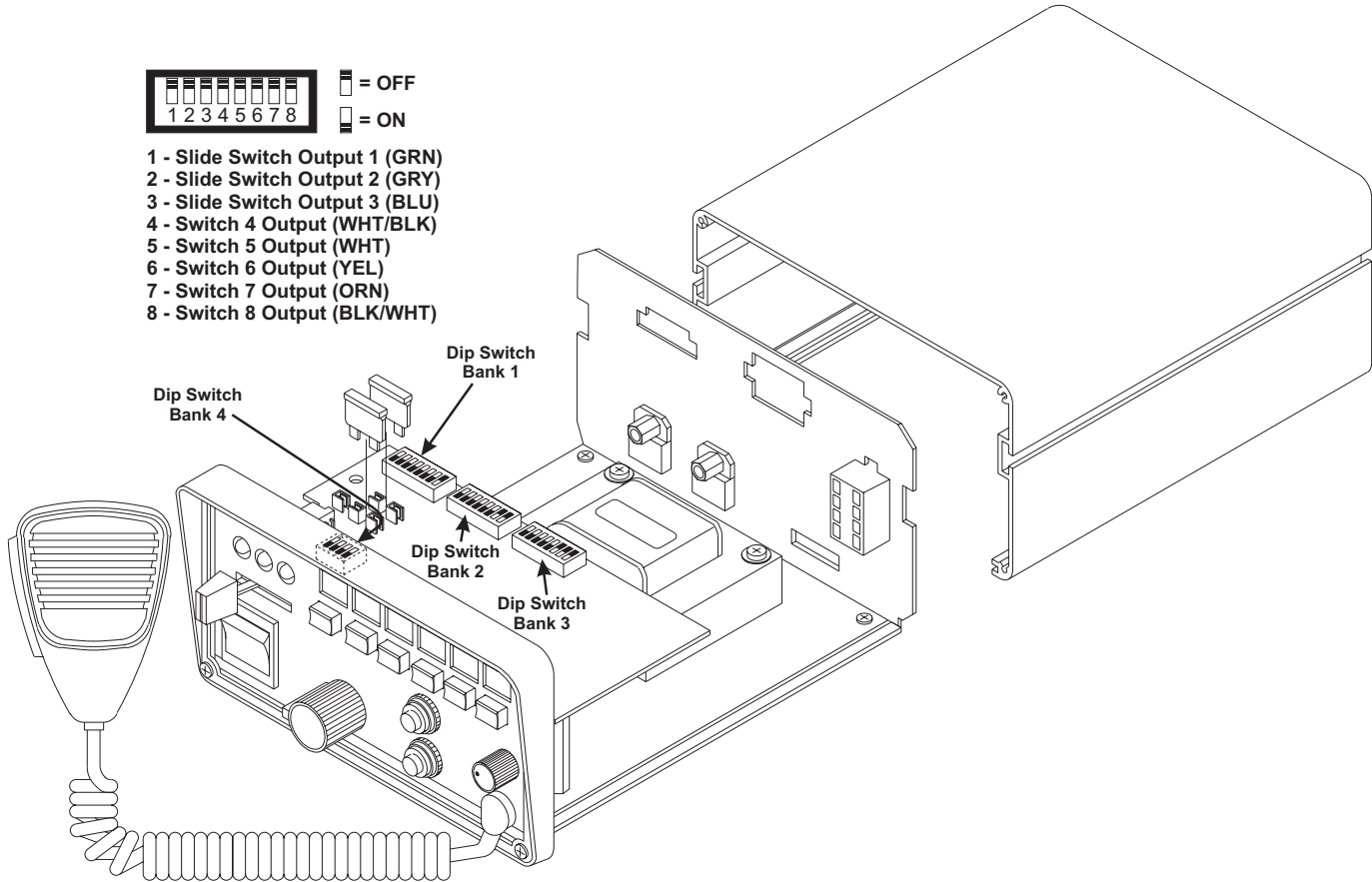
Slide Switch Positions:

- 0 = Terminals OFF
- 1 = Green
- 2 = Green / Grey
- 3 = Green / Grey / Blue

Push-Buttons:

- 4 = White / Black
- 5 = White
- 6 = Yellow
- 7 = Orange
- 8 = Black / White
- 9 = Violet

Changing Default Slide Switch Control:



Configuring Slide Switch Control:

The slide switch has four positions: 0 (off), 1, 2 & 3. When in position 0 (furthest to the left) the slide switch has not activated any outputs. In position 1, 2 or 3 the slide switch can activate any combination of outputs 1 through 8. Each active slide switch position uses a bank of dip switches to determine which outputs are to be active while the slide switch is in that position; position 1 uses dip switch bank 1, position 2 uses dip switch bank 2, and position 3 uses dip switch bank 3.

Each dip switch bank is comprised of 8 switches, each representing a corresponding output (switch 1 for output 1, switch 2 for output 2, etc.). If, for example, switches 1, 3, 4 & 6 on dip switch bank 1 are in the ON position, outputs 1, 3, 4 & 6 will be active when the slide switch is moved to position 1.

Slide switch configuration is as simple as deciding which outputs are to be active in a given position and then moving the corresponding dip switch on the appropriate dip switch bank to the ON position.

Custom Dip Switch Configuration (Dip Switch Bank 4):

Push-button 9 (momentary switch) can function in 4 different modes, defined by the 4-position dip switch bank 4. This bank is located on top of the circuit board and is only accessible with the cover removed from the PCCS9NP.

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.

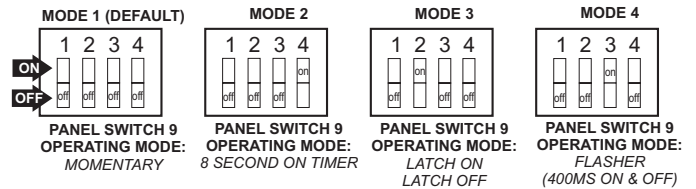
Enabling siren tones through slide switch pos. #3:

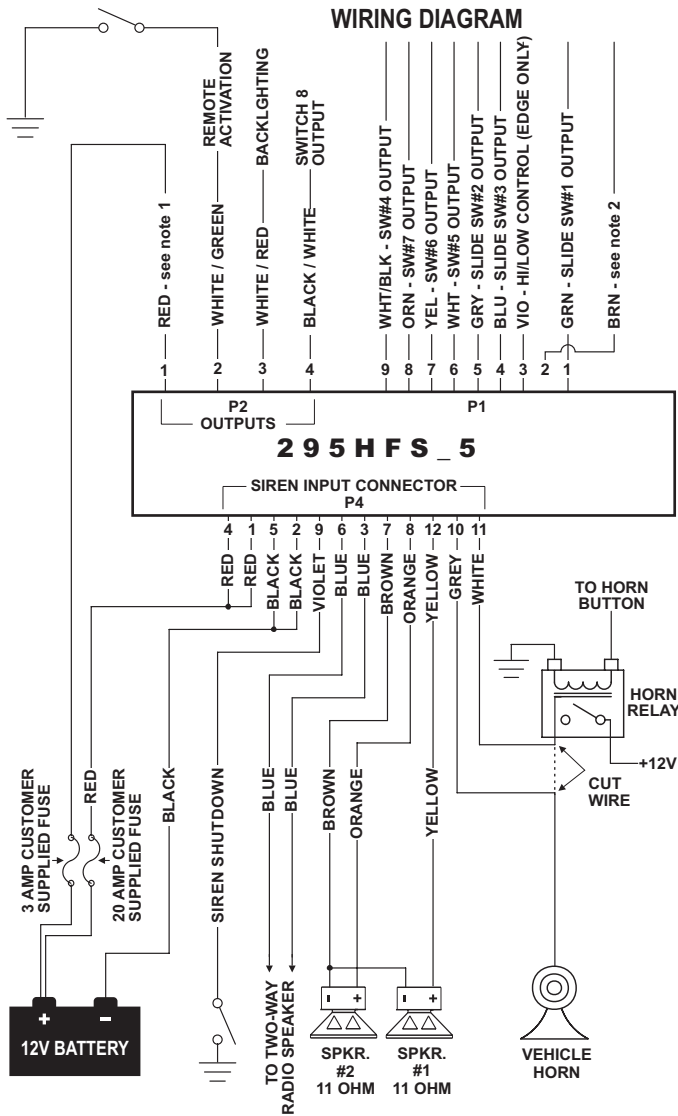
Slide switch position 3 can be configured to automatically activate siren tones, as described in "Rotary Switch Operations" (pg.6). If this is not desired, make sure that dip switch #1 on bank 4 is in the off position (the factory default position). Please note that siren activation through slide switch position 3 is only available when the power switch is in the ON position.

BANK 4 DIP SWITCH CHART, 4-POSITION
Default (factory) setting shown.

Switch 9 (momentary)				
	1	2	3	4
ON OFF	<input type="checkbox"/> Down (OFF)	<input type="checkbox"/> Down (OFF)	<input type="checkbox"/> Down (OFF)	<input type="checkbox"/> Down (OFF)

SWITCH 9 CAN TO OPERATE IN 4 DIFFERENT MODES, DEFINED BY THE 4-POSITION DIP SWITCH (Bank 4):





Note 1 - This RED wire provides power to the push-buttons. Fuse @ 3 amps and connect to switched +12VDC.
 Note 2 - This BROWN wire provides power to the slide switch. Fuse @ 3 amps and connect to +12VDC.

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@ 15 VDC @ 5.5 OHMS 185 WATTS MAX.

DIAGNOSTIC INDICATORS

There are 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 Indicator Response:

Under Voltage Speaker LED #2 will be in a double flash mode (2 quick flashes followed by a longer pause) and the siren tones will not operate.

Over Voltage Speaker LED #1 will be in a double flash mode (2 quick flashes followed by a longer pause) and the siren tones will not operate.

Speaker #1 Short Circuit Speaker LED # 1 will be in a single flash mode (the LED will be on and off an equal amount of time) and the siren tones will not operate.

Speaker #2 Short Circuit Speaker LED #2 will be in a single flash mode (the LED will be on and off an equal amount of time) and the siren tones will not operate.

Speaker #1 (Not Connected) Speaker LED #1 will be off, all tones will continue to operate.

Speaker #2 (Not Connected) Speaker LED #2 will be off, all tones will continue to operate.

RECOMENDED SIZE for CUSTOMER SUPPLIED WIRES:

Switch Power

- 18 AWG..... 13 FT. MAX
- 16 AWG..... 21 FT. MAX

Siren Power & Ground

- 12 AWG..... 18 FT. MAX
- 10 AWG..... 30 FT. MAX

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 (unit must be connected to the two-way radio as outlined in this manual).

With the Rotary Switch in this Position:

- Pressing the MAN switch will result in SI TEST® (see SI TEST section)
- Pressing the HORN switch will result in the AIRHORN tone until the HORN switch is released.
- Activating the HORN RING input results in the AIRHORN tone until the HORN RING input is released.
- Activating the SIREN SHUTDOWN input has no effect.
- Activating the AUX ENABLE input has no effect.

PA (Public Address) - When the rotary switch is in this 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. The best choice when public address is required.

With the Rotary Switch in this Position:

- Pressing the MAN switch will result in a WAIL tone ramping up to the peak frequency and ramping down to a stop at the lowest frequency when the MAN switch is released (model 295HFSM5 produces mechanical wail).
- Pressing the HORN switch will result in the AIRHORN tone until the HORN switch is released.
- Activating the HORN RING input will result in the AIRHORN tone until the HORN RING input is released (model 295HFSM5 produces mechanical wail).
- Activating the SIREN SHUTDOWN input has no effect (model 295HFSM5 will initiate 'Siren Brake').
- Activating the AUX ENABLE (or slide switch position 3, if selected) input will result in a repeating WAIL tone.

MAN (Manual Siren) - When the rotary switch is in this 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. This position is often the best choice when manual operation of the siren is desired.

With the Rotary Switch in this Position:

- Pressing the MAN switch will result in a WAIL tone ramping up to peak frequency and stopping when the MAN switch is released.
- Pressing the HORN switch will result in the AIRHORN tone until the HORN switch is released.
- Activating the HORN RING input will result in a WAIL tone ramping up to the peak frequency and stopping when the HORN RING switch is released.
- Activating the SIREN SHUTDOWN input has no effect.
- Activating the AUX ENABLE input (Or slide switch position 3, if selected) will result in a repeating WAIL tone.

HF (Hands Free Operation) - When the rotary knob is in the HF position, siren functions are placed in a stand-by mode. Siren tones are activated by a single "tap" on the MAN button or on the vehicle's steering wheel horn ring (if the vehicle's horn has been wired to the HORN RING input). The first tap produces a Wail tone (a steady rise and fall tone). A second tap produces a Yelp tone (a fast rise and fall tone.) A third tap produces a Piercer™ tone (an extremely fast rise and fall tone). The next tap returns the siren to a wail tone and the cycle repeats itself. Two quick successive taps will stop the siren.

With the Rotary Switch in this Position:

- Pressing the MAN switch will result in the HF cycle as described above.
- Pressing the HORN switch will result in the AIRHORN tone until the HORN switch is released.
- Activating the HORN RING input will result in the HF cycle as described above.
- Activating the SIREN SHUTDOWN input will shut the WAIL, YELP and PIERCER tones down. However the HORN and the HORN RING switch will activate an AIRHORN tone and the MAN switch will activate a momentary WAIL tone.
- Activating the AUX ENABLE input (or slide switch position 3, if selected) will start the HF cycle.

WAIL (Wail Tone) - When the rotary knob is in the WAIL position, a steady, rise and fall tone (Wail) is produced.

With the Rotary Switch in this Position:

- Pressing the MAN switch will change the siren tone to a yelp pattern. (a fast rise and fall tone).
- Pressing the MAN switch a second time returns it back to a Wail tone.
- Pressing the HORN switch will result in the Airhorn tone until the HORN switch is released.
- Activating the HORN RING input will change the siren tone to a Yelp pattern (a fast rise and fall tone).
- Activating the HORN RING input a second time returns it back to a Wail tone.
- Activating the SIREN SHUTDOWN input will shut the Wail, Yelp tones down. However the HORN and the HORN RING switch will activate an Airhorn tone, and the MAN switch will activate a momentary Wail tone.
- Activating the AUX ENABLE input has no effect.

YELP (Yelp Tone) - When the rotary knob is in the YELP position, a fast, rise and fall tone is produced.

With the Rotary Switch in this Position:

- Pressing the MAN switch will change the siren tone to a Piercer pattern (an extremely fast rise and fall tone).
- Pressing the MAN switch a second time returns it back to a Yelp tone.
- Pressing the HORN switch will result in the Airhorn tone until the HORN switch is released.
- Activating the HORN RING input will change the siren tone to a Piercer tone. Activating the HORN RING input a second time returns it back to a Yelp tone.
- Activating the SIREN SHUTDOWN input will shut the Yelp and Piercer tones down. However the HORN RING switch will activate an Airhorn tone and the MAN switch will activate a momentary Wail tone.
- Activating the AUX ENABLE input has no effect.

T3 (Piercer™ Tone) - When the rotary knob is in the T3 position, an extremely fast, rise and fall tone is produced. May be used for HI/LOW and mechanical wail in some applications.

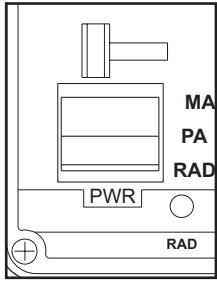
With the Rotary Switch in this Position:

- Pressing the MAN switch will result in the Airhorn tone until the MAN switch is released.
- Pressing the horn switch will result in the Airhorn tone until the HORN switch is released.
- Activating the HORN RING input will result in the Airhorn tone until the man switch is released.
- Activating the PARK SHUTDOWN input will shut the Piercer tone down. However the HORN and the HORN RING switch will activate an Airhorn tone, and the MAN switch will activate a momentary Wail tone (model 295HFSM5 will initiate 'Siren Brake').
- Activating the AUX ENABLE will have no effect.

Microphone

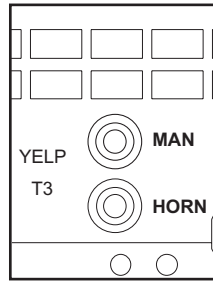
Whenever the power is on, activating the microphone (pressing the switch on the side of the mic.) will shut down any other siren functions and enable public address operation regardless of the rotary switch position or any other switch or input.

Siren Operations:



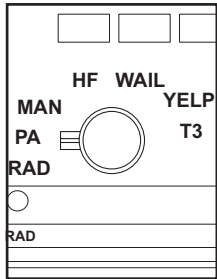
POWER SWITCH

This switch has two positions: Down / Off and 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. *NOTE: If this unit is connected to the vehicle's horn ring circuit, the vehicle horn is disabled when the power switch is in the ON position.*



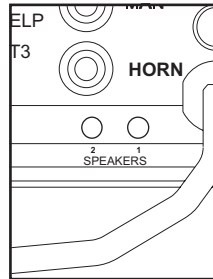
MAN BUTTON

The Manual button generates a variety of tones, depending on what position the rotary knob is in. For further explanation of this button's function, refer to Rotary Switch Operations.



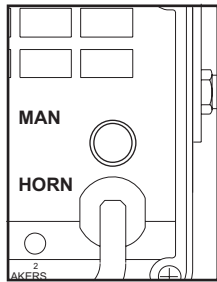
ROTARY SWITCH

The Rotary Knob control siren and PA (Public Address) functions. There are 7 positions that may be selected. Each position and its function is outlined under "Rotary Switch Operations".



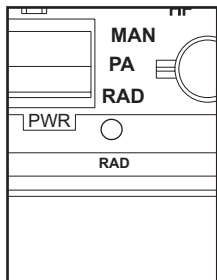
SI TEST® & DIAGNOSTIC INDICATORS

SI TEST is a diagnostic feature that allows the operator to confirm the proper operation of the siren speakers connected to the unit without activating an audible siren tone. To initiate SI TEST cycle, set the rotary knob to the RAD position. Now press and release the MAN button. As the siren is tested, its diagnostic indicator will turn on steady for about 1.5 seconds if no problems are detected. If the indicator flashes, or does not light at all, a problem with either the siren, speakers, or wiring has been detected. Check the wire connections of the failed speaker and repeat the SI TEST. If the speaker fails to test again, have the siren itself inspected by a qualified technician. *NOTE: Installed speakers are tested by generating an ultra-high frequency tone through each speaker. Although these tones are inaudible to humans, be sure that there is nobody within 5 feet of the speakers when SI TEST is running.*



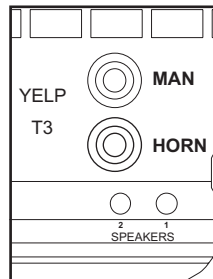
VOLUME KNOB

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. The volume knob has no effect on any siren tones produced.



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 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.



HORN BUTTON

Holding the HORN button on, generates an AIRHORN tone whenever the siren is powered up.