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Installation Guide
Siren Amplifier Models:
295HFSA1, 295HFSB1, 295HFSC1, 295HFSD1, 295HFSE1, 295HFSF1, 295HFSJ1, 295HFSM1, 295HFSW1

Automotive: Sirens/Switches

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 product is mounted with 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 owners 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 that 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!**

Form No.13379J (102605)

Installation:

Although technologically advanced, this unit is simple to install. 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-type mount is not possible, a bail strap mounting kit is included for over or under dash mounting.

READ BEFORE INSTALLING!!!

Do not install this product or route any wires in the deployment area of your airbag. Equipment mounted or located in the airbag deployment area will damage or reduce the effectiveness of the airbag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners 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. Whelen Engineering Company assumes no liability or responsibility for determining individual applications or exact installation location criteria.

Connecting the Power & Ground Wires (Red & Black):

RED (Power) and BLACK (Ground)

1. Insert the wiring harnesses into it's port as shown in Fig. 1.
2. Extend the 2 RED and 2 BLACK wires toward the firewall. Follow the same path as the factory wire harness.
3. Continue to follow the factory harness through the firewall. To pass the RED and BLACK wires through, 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.

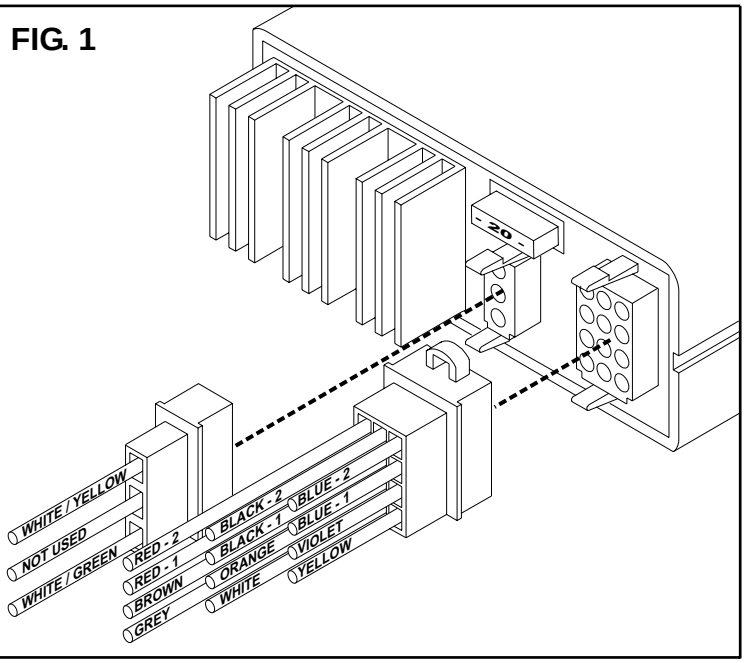
***WARNING:* All customer supplied wires that connect to the POSITIVE (+) terminal of the battery must be sized to supply at least 125% of the maximum operating current & be fused "at the battery" to carry that load!**

4. Route the RED and BLACK wires along the factory harness towards the battery.
5. Install a 30 amp fuse block (15 amp for a 24 volt unit) (user supplied) on the end of the RED wire.

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

6. Connect the fuse block wire to the POSITIVE (+) terminal on the battery. There must not be more than 2 ft. 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 any other wires.
7. Connect the BLACK wire to the factory chassis ground, adjacent to the battery.

FIG. 1



Connecting the Speaker Wires (Yellow, Orange & Brown):

1. Route the YELLOW, ORANGE and BROWN wires along the factory wire harness and through the firewall at the same point as the RED and BLACK wires.
2. Route these wires toward the vehicle siren speakers.
3. Connect the YELLOW wire to the POSITIVE speaker connection on speaker #1.
4. Connect the ORANGE wire to the POSITIVE speaker connection on speaker #2.
5. Connect the BROWN wire to the NEGATIVE speaker connection on speaker #2.
6. Splice a wire from the NEGATIVE speaker connection on speaker #1 to the NEGATIVE speaker connection on speaker # 2.

Connecting the Horn Relay Wires (White & Grey):

1. Route the WHITE and GREY wires along the factory wire harness and through the firewall at the same point as the RED and BLACK wires.
2. Locate your vehicle's horn relay and route the WHITE and GREY wires to this. If possible, follow the factory wire harness to this relay.
3. Locate the wire that connects the vehicle horn to the horn relay and cut it.
4. Connect the WHITE wire to the wire coming from the horn relay.
5. Connect the GREY wire to the wire coming from the horn.

Note:*The two (2) remaining BLUE wires are used to connect your two-way radio's external speaker for radio re-broadcast. This is an optional connection and will not effect the other operations.*

Note:*Radio re-broadcast will <u>NOT</u> work with amplified remote speakers! If your remote speaker is amplified (I.E.: contains a power amp circuit in the speaker assembly), do not enable the radio re-broadcast feature.*

6. Locate the two wires that connect the external speaker to the two-way radio.
7. Cut one of these wires and splice one of the BLUE wires into this circuit.
8. Cut the remaining speaker wire and splice the remaining BLUE wire into this circuit.

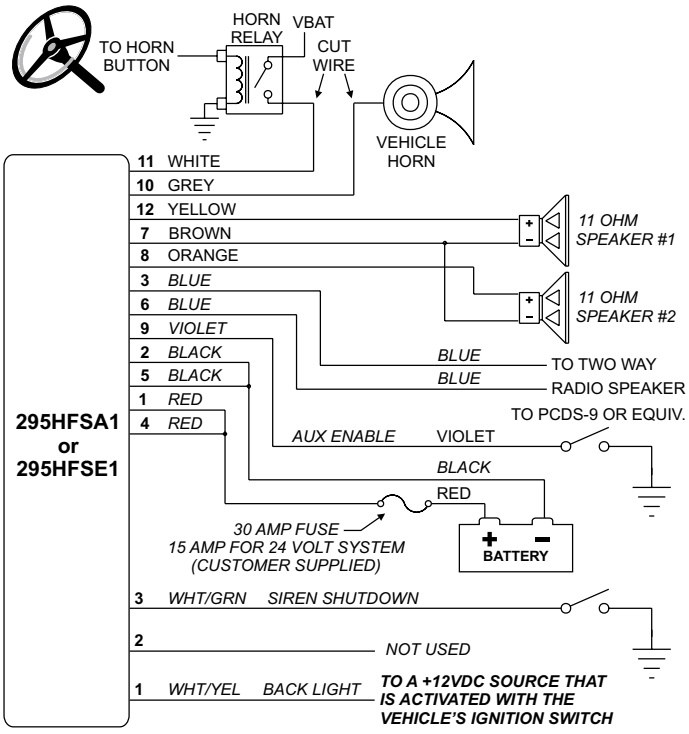
Connecting to a Remote Control-head / Optional:

This unit may be connected to an existing control-head, such as the Whelen PCDS-9 or equivalent. This is an optional connection that enables the WAIL tone to be activated through the use of a PCDS-9 button or switch. If this connection is not chosen, cut the VIOLET wire and cap it to prevent accidental grounding of the wire.

Siren Shutdown (Optional Connection):

This unit can be configured to cease all automatic siren tones whenever the WHITE/GREEN wire is connected to ground through a switch. If this feature is used, model 295HFSM1 will simulate a "siren brake"; siren tones in all other models will stop immediately. If this feature is not desired, cut and cap the WHITE/GREEN wire (see wiring diagram).

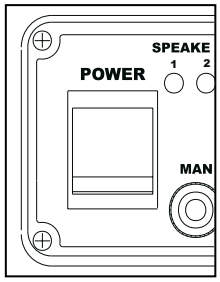
WIRING DIAGRAM



Back Lighting (White/Yellow wire):

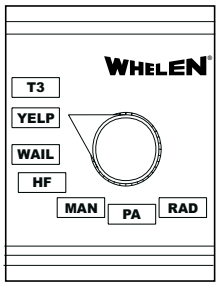
When the power switch is on, the 295HFS backlighting is activated. When the power switch is off, backlighting can be turned on by connecting the WHITE / YELLOW wire to a +12VDC source that is activated with the vehicle's ignition switch.

Operating the Controls:



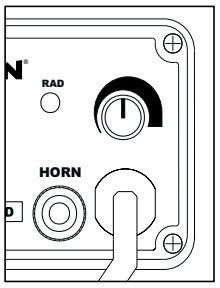
POWER SWITCH

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. ***Note:*** *If the unit is connected to the vehicle's horn ring circuit, the vehicle horn is disabled when the power switch is in the ON position.*



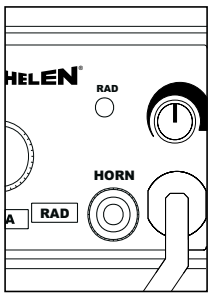
ROTARY SWITCH

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



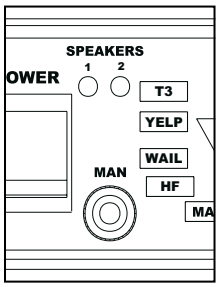
VOLUME KNOB

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.



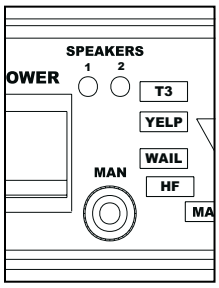
RADIO REPEAT VOLUME

Before using this unit, 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 it's 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.



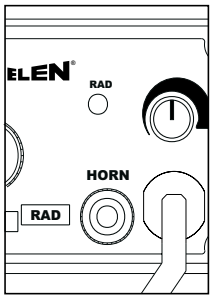
MAN BUTTON

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.



SI-TEST® & DIAGNOSTIC INDICATORS

SI-TEST® is a diagnostic feature and allows the operator to confirm the proper operation of the siren speakers connected to the unit without activating an audible siren tone. To initiate the 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 inspected by a qualified technician. *<u>WARNING:</u> Installed speakers are tested by generating an ultra-high frequency tone through each speaker. Although these tones are inaudible to humans, be sure there is nobody within 5 feet of the speakers when SI-TEST® is running.*



HORN BUTTON

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

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 SITEST (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. This position is often 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 295HFSM1 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.**
  NOTE: Model 295HFSM1 will produce mechanical wail.
- **Activating the SIREN SHUTDOWN input has no effect.**
  NOTE: Model 295HFSM1 will initiate 'Siren Brake'.
- **Activating the AUX ENABLE 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 will result in a repeating WAIL tone.**

HF (Hands Free Operation) - When the rotary knob is in the HF position, the siren functions are placed in a stand-by mode. Siren tones are activated by a single tap on the MAN button or a single tap 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 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 pattern. 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 / LO 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 SIREN 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.**
  NOTE: Model 295HFSM1 will initiate 'Siren Brake'.
- **Activating the AUX ENABLE will have no effect.**

NOTE:
Models 295HFSA1 / 295HFSE1 and 295HFSC1 / 295HFSH1 produce the PIERCER tone when T3 is selected.

Models 295HFSB1 / 295HFSF1 and 295HFSD1 / 295HFSJ1 produce the HI / LO tone when T3 is selected.

Model 295HFSM1 produces mechanical wail when T3 is selected.

Model 295HFSW1 produces a WHOOP tone when T3 is selected (with WARBLE as the override tone).

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 & enable public address operation regardless of the rotary switch position or any other switch or input.

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)

SPECIFICATIONS / 24 Volt Models

INPUT VOLTAGE . . . . . 25.5 VDC ±20%
INPUT CURRENT @28 VDC @ 5.5 OHMS . . . . 8 AMPS MAX.
INPUT FUSE . . . . . .10 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)

Diagnostic Indicators:

This 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	Diagnostic Indicators Response
Under Voltage	*Speaker L.E.D. #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 L.E.D. #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 L.E.D. # 1 will be in a single flash mode (the L.E.D. will be on and off an equal amount of time) and the siren tones will not operate.*
Speaker #2 Short Circuit	*Speaker L.E.D. #2 will be in a single flash mode (the L.E.D. will be on and off an equal amount of time) and the siren tones will not operate.*
Speaker #1 Open Circuit	*Speaker L.E.D. #1 will be off (having a single speaker system will always cause this condition for the speaker output not in use) all tones will continue to operate.*
Speaker #2 Open Circuit	*Speaker L.E.D. #2 will be off (having a single speaker system will always cause this condition for the speaker output not in use) all tones will continue to operate.*