A Division of Star Headlight & Lantern Co., Inc.

INSTALLATION AND OPERATING INSTRUCTION MANUAL

SS650 SIREN AMPLIFIER

LCS652 SIREN AMPLIFIER and LIGHT CONTROLLER

455 Rochester Street Avon, NY 14414
Telephone Number: (585) 226-9025 Toll Free Fax: 888-478-2797
www.star1889.com

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INSTALLATION INFORMATION

MODEL: SS650-008___ or LCS652___
SERIAL NO: _____
PURCHASE DATE: _____
DEALER: _____
INSTALLATION DATE: _____
INSTALLER: _____

OPTIONS
_____ Phaser Disabled
_____ Two-Tone Enabled
_____ Negative Aux. Polarity

Model and serial number located on the bottom of the amplifier unit

TABLE OF CONTENTS

NOTICE

Due to continuous product improvements, we must reserve the right to change any specifications and information contained in this manual at any time without notice. Signal Vehicle Products, Inc. makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Signal Vehicle Products, Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Important: Improper installation and/or use of these products may result in vehicular collision, personal injury and/or death. Star Headlight & Lantern Co., Inc., and its subsidiaries shall not be held responsible for damages directly or indirectly caused by improper installation or use of this product.

GENERAL DESCRIPTION

The SS650 and LCS652 Siren Amplifiers are designed for single 100W speaker use. Each comes standard with the amplifier unit and switch panel all in one unit. The primary operating modes are Wail, Yelp, Standby, Manual, and Horn. Both the Horn and the Manual Control function will override all other functions, and can be utilized at any time via a rocker switch. The Phaser function can be optionally disabled entirely with a program jumper.

The siren amplifier has been designed with several protection features to provide exceptional field service. Excessively high voltage detection will disable the siren output to protect both the amplifier and the speaker. Fused inputs provide safety against reverse polarity. Speaker protection shuts down the speaker output if it becomes electrically shorted. CAUTION: These protection features will not guard against overloading the outputs.

In addition, the LCS652 also has two switches for controlling two external devices, typically warning lights.

SAFETY PRECAUTIONS

For the safety of the installer, vehicle operator, passengers and the community please observe the following safety precautions. **Failure to follow all safety precautions and instructions may result in property damage, injury or death.**

DO NOT mount in air bag deployment area.

Devices should be mounted only in locations listed in SAE standard J1849.

Controls should be placed within convenient reach of the driver.

Assure clearances before drilling in vehicle.

Sound levels produced by attached speakers can cause permanent hearing loss.

Never operate this unit without adequate hearing protection for you and others in the area. (OSHA 1910.95)

GENERAL INSTALLATION

Proper installation of the unit is essential for years of safe, reliable operation. Please read all instructions **before** installing the unit. Failure to follow these instructions can cause serious damage to the unit or vehicle and may void warranties.

Qualifications
The installer must have a firm knowledge of basic electricity, vehicle electrical systems and emergency equipment.

Keep These Instructions
Keep these instructions in the vehicle or other safe place for future reference. Advise the vehicle operator of the location.

Unpacking
Inspect contents for shipping damage. If any damage is found alert the carrier immediately. Contents should include: an amplifier box with wiring pigtail, a "U" bracket with screws for mounting, and these instructions. Please contact supplier immediately if any components are missing.

INSTALLER-SELECTABLE OPTIONS

The SS650 and LCS652 have Phaser disable, Two-Tone enable, and Auxiliary Horn Polarity options that can be selected during installation. An internal jumper on the printed circuit board inside the amplifier case allows the installer to select these options. These options should be set before installation of the unit.

Phaser Tone Disable – The Phaser function can be completely disabled by moving one of the option jumpers inside the amplifier unit from "Extra" position to the "TD" (Tone Disable) position. When Phaser is disabled, the Manual button (MAN or MANUAL) will not have any effect on the tone while the siren is in the YELP mode (in WAIL, it will still change the tone to YELP).

Two-Tone Enable - The Two-Tone function can be enabled by moving one of the option jumpers inside the amplifier unit from "Extra" to the "Two-Tone" position. When Two-Tone is enabled, a European Two-Tone (HI-LO) sound will replace the Phaser sound when the MAN or MANUAL button is pressed while the siren is in the YELP mode. (The tone will toggle between YELP and Two-Tone each time the MAN or MANUAL button is pressed).

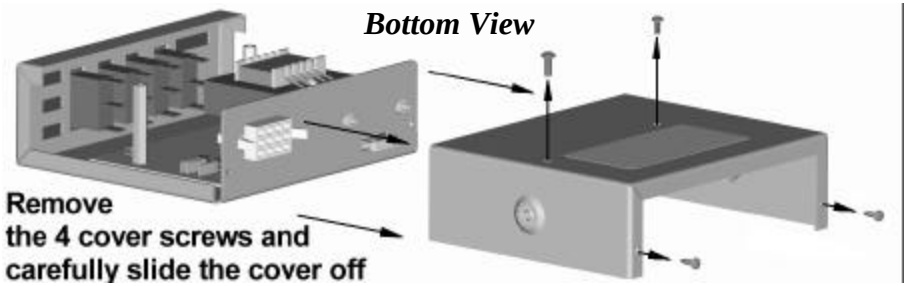
Auxiliary Horn Polarity - The Auxiliary Input allows activation by an external source of the Horn function. This input is usually wired into the vehicle horn switch. The wiring diagram on page 8 shows two connection examples. NOTE: Permanent disconnection of the vehicle horn is NOT recommended.

The auxiliary input is normally activated by applying a positive voltage to the wire. To activate by connecting to ground (negative), move the "AUX" option jumper from the "Pos." pins to the "Neg." pins. (See diagram on next page).

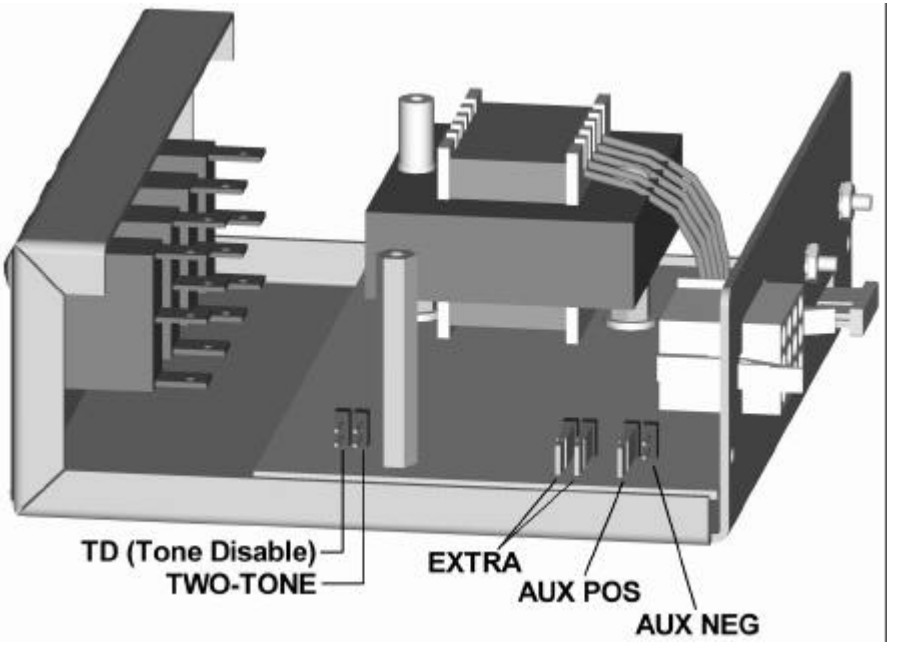
If you would like to disable the Phaser, enable Two-Tone, or change the Auxiliary polarity proceed with Amplifier Cover Removal below. If you do not need to set these options, proceed the MOUNTING section on the page 5.

AMPLIFIER COVER REMOVAL

If you need to change any of the three options listed above you will need to access the inside of the siren. Remove the two Philips head screws located on the bottom of the unit and the two Philips head screws from the rear, and slide the cover off the back of the unit.



Once the cover is removed, you may move the necessary jumpers over from the "Extra" slots.



MOUNTING

AMPLIFIER

The SS650 and LCS652 sirens may be mounted above the dash, below the dash, on a tunnel, or in a rack with the mounting u-bracket provided. Choose a mounting location convenient to the operator and away from any air bag deployment areas. Inspect behind mounting area for clearance. Assure adequate ventilation to prevent overheating. Consider wire routing and access to connections. Install mounting bracket to vehicle using 1/4" hardware (not supplied).

If mounting in a rack or console, make sure that mounting bolts do not enter case more than 1/4".

ELECTRICAL CONNECTIONS

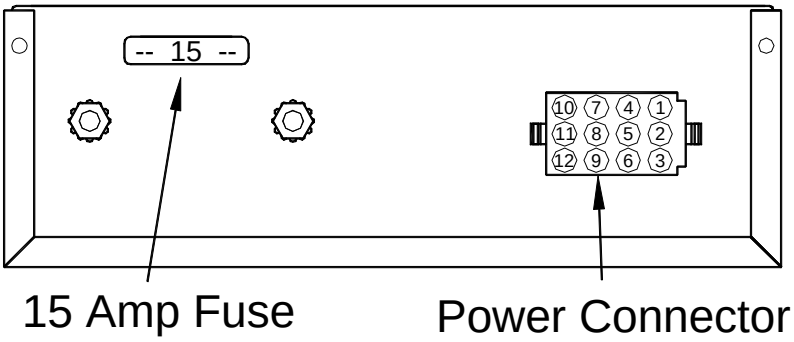
WIRE SIZE AND TERMINATION

When running your wires and making your connections, please adhere to the following guidelines:

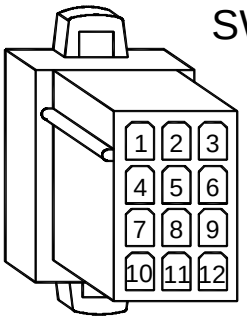
- RFI: Mount the siren at least 12” from any strobe lights and/or any two-way radios.
- The wiring diagram on pages 8 shows the minimum wire size used for each connection. If the wire is longer than 10 ft. we recommend the use of the next larger wire size.
- If using your own connectors, use only high quality crimp connectors.
- Make sure all connections are tight.
- Route wiring to prevent wear, overheating and interference with air bag deployment.
- Use grommets and sealant when passing through compartment walls.
- Minimize the number of splices to reduce voltage drop.
- Ground connections should only be made to substantial chassis components, preferably directly to the negative of the vehicle battery.
- Install and check all wiring before connection to the vehicle battery.

AMPLIFIER

All of the necessary electrical connections to the amplifier are made through a connector located on the back of the amplifier case.

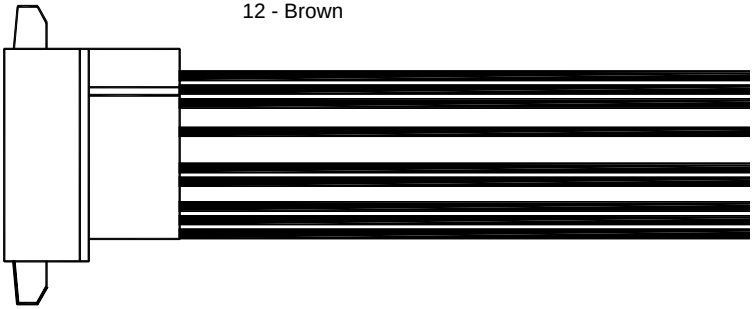


You should also find enclosed with your siren a wiring harness. The SWH-27 wiring harness is used in the SS650. The SWH-83 comes with the LCS652. They come with a 12-port connector using six or nine different colored leads.



SWH-27 or SWH-83

1 - Red
2 - Black
3 - White w/Brown Stripe (SWH-83/LCS652 Only)
4 - Red (SWH-83/LCS652 Only)
5 - OPEN
6 - White w/Orange Stripe
7 - Brown
8 - Red (SWH-83/LCS652 Only)
9 - OPEN
10 - Green
11 - OPEN
12 - Brown



You should make all electrical connections to the wiring harness before installing the connector on the amplifier. If the amplifier ever needs service, the connector can be easily removed from the amp without unwiring it.

Wiring Connections:

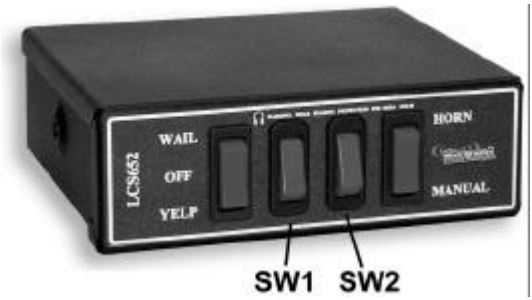
Black: *(Pin 2)* **Ground** - Connect the black wire to the negative of the battery, or to a good chassis ground. Be sure to use minimum size #16 AWG wire.

Red: *(Pin 1 for SS650 and Pins 1, 4 & 8 for LCS652)* **Power** - Connect the red wires to +12 VDC. It is strongly recommended that you connect to a +12 VDC source that is present only when the vehicle ignition is in the on position. A power relay may also be used. Be sure to use minimum size #16 AWG wire for Pin 1 and #14 AWG wire for Pins 4 and 8. Connect the red wires from Pins 4 & 8 through an appropriate user supplied fuse (up to 20 amps). It is ***highly recommended*** that you appropriately fuse these input wires. Damage to the siren caused by shorts in the devices connected to SW1 or SW2 will not be covered under warranty.

Brown: *(Pins 7 & 12)* **Speaker Leads** - Connect one lead to each terminal or lead of the speaker. Be sure to use minimum size #16 AWG wire.

White w/Orange Stripe: *(LCS652 Only - Pin 6)* **SW1 Output**
This lead supplies power to the device connected to SW1 (the second switch from the left). Be sure to use minimum size #14 AWG wire.

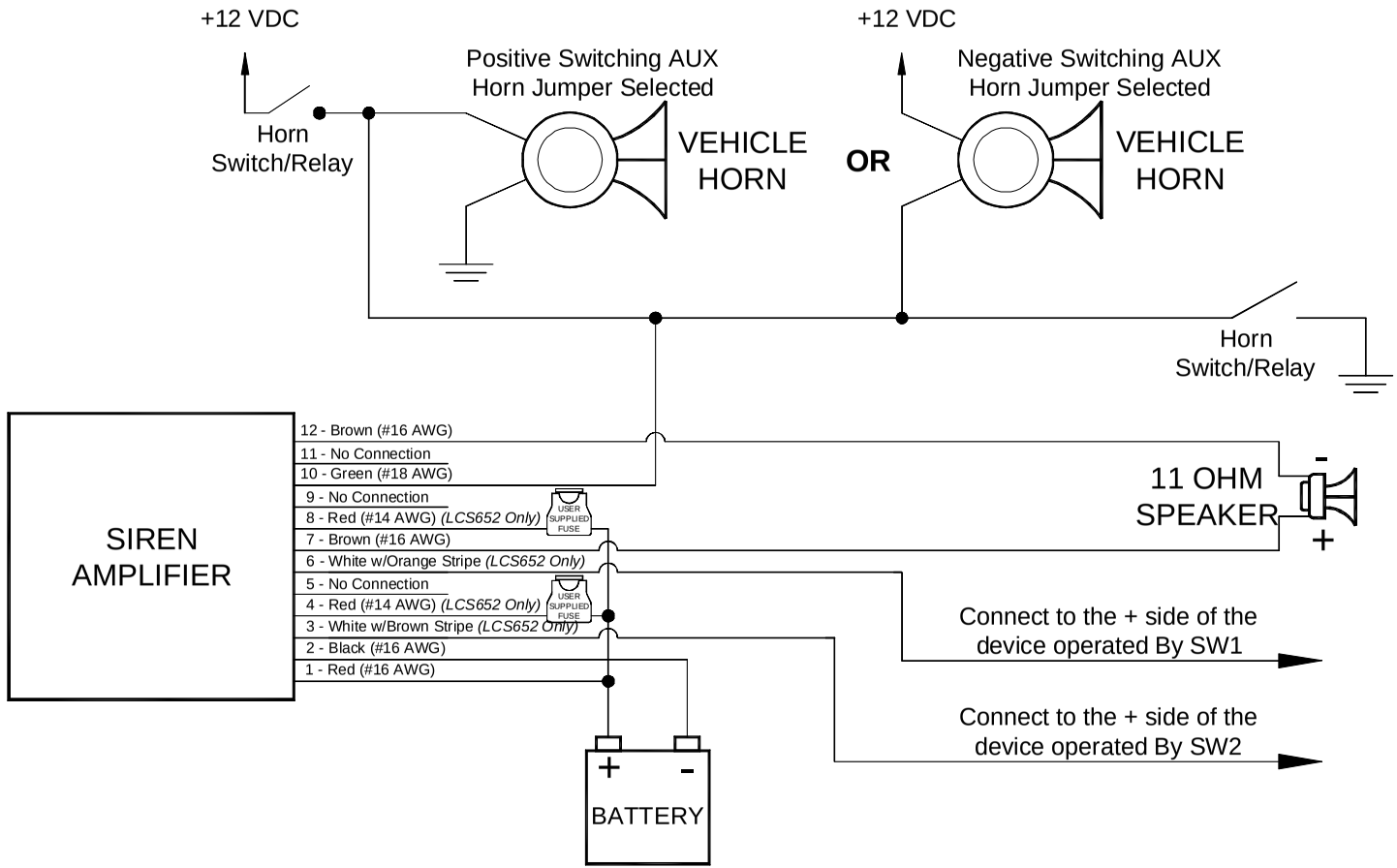
White w/Brown Stripe: *(LCS652 Only - Pin 3)* **SW2 Output**
This lead supplies power to the device connected to SW2 (the third switch from the left). Be sure to use minimum size #14 AWG wire.



Optional Connections:

Green: *(PIN 10)* **AUX or Horn Ring** - Used for remote (Aux.) HORN control. Connect to horn ring circuit or remote switch. Siren is shipped with positive voltage activation defaulted (apply +12VDC for activation). For vehicles with negative activation (connect to ground for activation), the unit must be opened up and have the Aux. Horn polarity jumper switched. Refer to pages 3 & 4 for further details.
NOTE: Cut this lead short if not used, and insulate with electrical tape.

Testing - *Test all siren and light functions after installation to assure proper operation. Test vehicle operation to assure no damage to vehicle.*


+12 VDC
Positive Switching AUX
Horn Jumper Selected
Horn
Switch/Relay
VEHICLE
HORN
+12 VDC
OR
Negative Switching AUX
Horn Jumper Selected
VEHICLE
HORN
Horn
Switch/Relay
SIREN
AMPLIFIER
12 - Brown (#16 AWG)
11 - No Connection
10 - Green (#18 AWG)
9 - No Connection
8 - Red (#14 AWG) (LCS652 Only)
7 - Brown (#16 AWG)
6 - White w/Orange Stripe (LCS652 Only)
5 - No Connection
4 - Red (#14 AWG) (LCS652 Only)
3 - White w/Brown Stripe (LCS652 Only)
2 - Black (#16 AWG)
1 - Red (#16 AWG)
USER SUPPLIED FUSE
USER SUPPLIED FUSE
11 OHM
SPEAKER
-
+
Connect to the + side of the
device operated By SW1
Connect to the + side of the
device operated By SW2
+
-
BATTERY

OPERATION

GENERAL

This unit is designed for easy operation under the stress associated with high-speed pursuit. Most siren functions are accessible with one simple motion without repetitive activation of switches or automatic timed switching that can interfere with desired operation.

MODE SWITCH

The three-position rocker switch on the left controls the primary operating mode of the siren.

WAIL - A normal rise-fall tone used on highways and areas with low traffic or constant traffic flow.

YELP - A rapid warble tone used in light to moderately congested areas.

OFF - **(Manual/Standby)** - A silent mode that allows activation of HORN and MANUAL (MAN) via a momentary rocker switch. The siren output *winds down* when the MANUAL rocker switch is released.

HORN

This momentary rocker switch provides a simulated air-horn tone while pressed. This can be used to either replace, or to supplement the normal vehicle horn and is useful at intersections or in high noise areas. This tone will override all other siren tones.

MAN or MANUAL

With the left selector switch in the OFF position, the MAN or MANUAL momentary switch provides a manually activated Wail siren tone. While the selector switch is in the Wail or Yelp position, this switch provides a generally quicker changing tone. (See table on next page). These quicker tones are used to momentarily alert motorists at intersections and very highly congested areas. Pressing the button once changes to the next faster tone. Pressing the MAN or MANUAL button again will toggle the siren back to the original tone.

Optional configuration allows disabling of the Phaser tone entirely. This option is selected during installation and may be governed by State or Local laws. (Refer to the INSTALLER SELECTABLE OPTIONS section on pages 3 & 4).

SIREN OUTPUT:

Selector Switch Position:	Speaker Output	Pressing Manual Pushbutton
Wail	Wail	Yelp
Yelp	Yelp	Phaser (or Two-Tone) (Remains Yelp if Phaser disabled)
OFF	No Output	Creates a manual WAIL tone while button is being held that sweeps down when the button is released.

(NOTE: PHASER may be optionally disabled via program jumpers. See INSTALLER-SELECTABLE OPTIONS on pages 3 & 4).

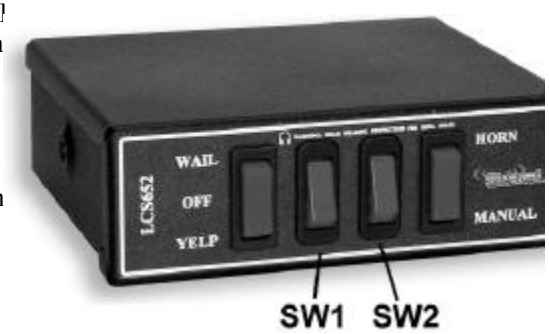
(NOTE: TWO-TONE may be optionally selected over Phaser via program jumpers. See INSTALLER-SELECTABLE OPTIONS on pages 3 & 4).

AUXILIARY INPUT

During installation an auxiliary input may be connected to the vehicle horn ring or other switching device. It provides the same operation as pressing the Horn button. See wiring diagram on page 8 for wiring details.

LIGHT CONTROL SWITCHES *(LCS652 Only)*

The LCS652 also has two additional switches (SW1 and SW2) located in the center of the face. These two switches will control external devices (usually lights). SW1 controls the device connected to the white w/orange stripe wire from Pin 6. SW2 controls the device connected to the white w/brown stripe wire from Pin 3.



Please Note: *The two red wires on pins 4 & 8 (LCS652 only) supply the power for the devices switched by SW1 and SW2. Connect the red wires from Pins 4 & 8 through an appropriate user supplied fuse (up to 20 amps) It is* ***highly recommended*** *that you appropriately fuse these input wires. Damage to the siren caused by shorts in the devices connected to SW1 or SW2 will not be covered under warranty.*

If you have any questions concerning this or any other SVP product, please contact our ***Customer Service Department*** at (585) 226-9025.

TROUBLESHOOTING

Symptom	Possible Cause	Check
No power	Power source not turned on	Is ignition switch in AUX or ON position?
	Connector loose	Do you hear a “pop” when turned on?
	Amplifier 15A fuse blown	Is power hooked up backwards? Positive ground vehicle?
		Is an external fuse or circuit breaker used?
	Loose connection at power source	Are the negative leads connected to a good ground?
No siren tone	High voltage protection	Input voltage must be less than 16 volts.
	Bad speaker or speaker wiring	Check for a short or an open in the output.
Distorted siren sound	Speaker assembly loose	Is the speaker bell or tip loose?
	Intermittent Aux. Input connection	Is the Aux. Input used and wired properly?
	High vehicle voltage	Input voltage must be less than 16 volts.
Intermittent siren tone	High voltage protection	Is the vehicle voltage regulator working properly?
	Circuit breaker in supply	Is a circuit breaker used with at least a 50A rating?
	Bad Connection	Is the connector tight on the back of the unit?
	Shorted speaker or speaker wire	Does the speaker have water damage, or is a wire pinched?
Horn function or Manual function stuck on	Horn switch stuck	Does the horn switch return fully when released?
	MAN switch stuck	Does the MAN push-button switch return fully when released?
	Aux. Input improperly connected	Is the AUX Input used and wired properly?
	Aux. Horn Input Polarity reversed	Is the AUX horn wire wired for correct polarity?
Wrong siren tone	Two-Tone option jumper installed	Is the TT jumper option properly configured?
	Aux. Horn Input Polarity reversed	Is the AUX horn wire wired for correct polarity?
Phaser not working	Phaser disabled	Is the TD jumper option configured properly?

SPECIFICATIONS

Input Voltage	10 - 16 VDC (negative ground)
Input Current	8 Amps @ 13.6 VDC (100W speaker)
Standby Current	Less than 20 mA
Output Power	105 WATTS RMS MAX. (15.0 VDC - single 100W speaker)
Siren Frequency	675Hz - 1633Hz
High Voltage Protection	16 - 18 VDC will cause siren output to cease, resume at normal
Short Circuit Current	50 AMPS (supply circuit must be capable of supplying this)
Operating Temperature	-15° F to +140°F
Controls	3-position primary mode rocker switch (Wail, Yelp, and Standby) Momentary 3-position rocker switch (Horn and Manual) Phaser disable (jumper programmable) Two-Tone Enable (jumper programmable) Auxiliary Horn Polarity (jumper programmable) Two 2-Position Light Control Switches (LCS652 only)
Connections (12-Pin Connector)	Detachable, 12-pin, positive locking connector with pigtail leads (1) Positive, (1) Negative, (2) Speaker, and (1) auxiliary Horn. *LCS652 only:* (2) Additional Positive
Size	2" High, 6" Wide, 5¼" Deep
Boxed Weight	3.5 lbs.

PARTS

The following parts are available from Signal Vehicle Products:

Part	Description
P30235-19P	Amplifier Top Cover
P30234-19P	Amplifier Bottom Mounting Plate
SWH-27	SS650 Wiring Harness
SWH-83	LCS652 Wiring Harness
30052-30	Rear Amplifier Case Screws
30052-26	Bottom Amplifier Case Screws
30028-6	15 Amp Automotive Blade Fuse for Amplifier
30032-8	TIP36C Power Transistor
30007-41	3-Position Rocker Selector Switch (WAIL/YELP)
30007-42	Momentary Rocker Switch (HORN/MAN)
SW-40	Lighted ON/OFF Rocker Switch (LCS652)

LIMITED WARRANTY

Signal Vehicle Products warrants this new product to be free from defects in material and workmanship, under normal use and service, for a period of one (1) year from the date of delivery to the first user-purchaser.

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

This warranty does not cover labor charges for removal or re-installation of the product. Fuses and lamps are not covered under this warranty.

This warranty does not extend to any unit that has been subjected to abuse, misuse, improper installation or which has not been adequately maintained, nor to units which have problems related to service or modification at any facility other than the manufacturer.

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 SIGNAL VEHICLE PRODUCTS BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIALS OR WORKMANSHIP.

RETURNS

If you have any questions concerning this or any other SVP product, please contact our ***Customer Service Departmen***t at (585) 226-9025. If a product must be returned for any reason, please contact our ***Repair Department*** to obtain a Returned Goods Authorization number (RGA#) before you ship the product to SVP. Please write the RGA# clearly on the package near the mailing label.

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