
INSTALLATION AND INSTRUCTION MANUAL

SS650-013 SIREN



LCS652-013 SIREN and Light Controller



PROUDLY MADE IN THE USA
An ISO 9001:2008 Certified Company



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NOTICE

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Installation Information

SERIAL NO: _____	DIP SWITCH OPTIONS
PURCHASE DATE: _____	_____ Negative Aux. Polarity
DEALER: _____	_____ Hands Free Enabled
INSTALLATION DATE: _____	
INSTALLER: _____	
Model and serial number located on the bottom of the amplifier unit	

Specifications

Input Voltage	10 - 16 VDC (negative ground)
Audio Input Current	8 Amps @ 13.6 VDC (100W speaker)
Standby Current	Enable wire off 0mA Backlighting off: 8 mA
Output Power	105 WATTS RMS MAX. (15.0 VDC - single 100W speaker)
Siren Frequency	675Hz - 5kHz
High Voltage Protection	> 16 VDC will cause siren output to cease, resume at normal < 10 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 (-30°C) to +140°F (60°C)
Size	2" High, 6" Wide, 5-3/4" Deep
Boxed Weight	3.4 lbs.

General Description

The SS650 AND LCS652 Remote Siren Amplifiers are designed for single 100W speaker use. They come standard with the amplifier unit and control head (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 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. A fused input provides safety against reverse polarity. Speaker protection shuts down the output if the speaker output becomes electrically shorted.

CAUTION: These protection features will not guard against overloading the outputs.

Installation Notes

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. SS650 AND LCS652 contents should include: an amplifier box with 10-terminal connector, a "U" bracket for mounting, and these instructions. Please contact Star Headlight & Lantern Co., Inc. immediately if any components are missing.

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

Mounting



Care should be taken when positioning this unit and cord so that the unit and/or cord does not interfere with the proper operation of the driver-side or passenger-side airbag! Failure to heed this warning may result in serious or fatal injury!!!

!!! CAUTION !!!

- Mount in a location with adequate ventilation to prevent overheating.
- 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)

- The SS650 AND LCS652 siren may be mounted with the mounting U-bracket provided.
- Consider wire routing and access to connections.
- Install mounting bracket to vehicle using 1/4" hardware (not supplied).

Electrical Connections

Wire Size and Termination

Electrical connections to this unit are made through the green 10-terminal connector located in the rear of the unit (P/N P30041-177).

Examine the charts below to determine the proper gauge of the wire you should use. Please review the following recommendations to follow when making your installation:



P30041-177

- Use only high quality crimp connectors. Make sure all connections are tight.
- Minimize the number of splices to reduce voltage drop.
- Route wiring to prevent wear, overheating, and interference with air bag deployment.
- Use grommets and sealant when passing through compartment walls.
- 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 vehicle battery.
- **CAUTION: All wires should be rated for at least 125% of their maximum current load. All wires connected to the positive terminal of the battery should be fused at the battery for their rated load.**
- Review the charts below that indicate the recommended wire gauge, based upon the length of the wire run and the current that will pass through the wire.
- An optional wiring kit (SWH-152) is available.

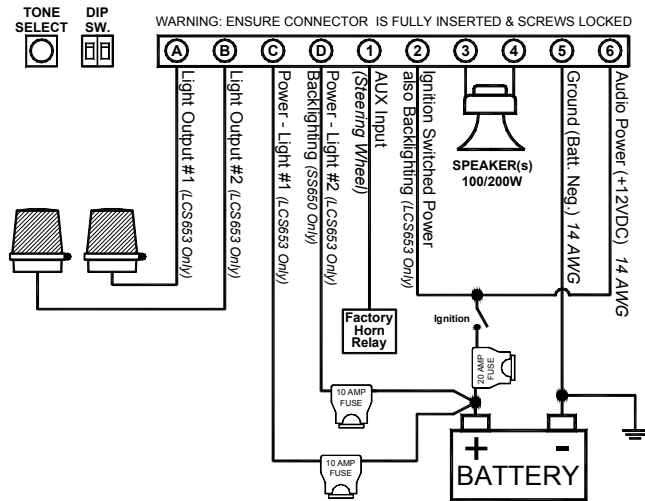
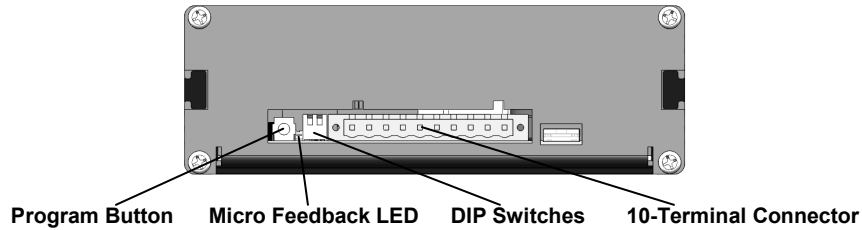
WIRING GUIDE

Input/Output	Description	Typical Color	Typical Current
A	Output 1 (LCS652 only)	Optional	10 AMPS
B	Output 2 (LCS652 only)	Optional	10 AMPS
C	Input Light Power 1 (LCS652 only)	Optional	10 AMPS
D	Input Light Power 2 (LCS652 only) and Backlighting	ORANGE	10 AMPS
1	AUX	GREEN	0.002 AMPS
2	Ignition Switched Power	YELLOW	0.14 AMPS
3	Speaker 1	BROWN	4 AMPS
4	Speaker 2	BROWN	4 AMPS
5	Battery Negative/Ground	BLACK	11 AMPS
6	Audio/Siren Power	RED	10 AMPS

RECOMMENDED WIRE GAUGE

Current	10'	20'	25'
< 2.0A	22 AWG	18 AWG	18 AWG
4.0A	18 AWG	16 AWG	16 AWG
5.5A	18 AWG	16 AWG	14 AWG
8.0A	16 AWG	14 AWG	14 AWG
12.0A	16 AWG	12 AWG	12 AWG

(Electrical Connections CONT'D)



MANDATORY ELECTRICAL CONNECTIONS

Ground - Connect terminal 5 to the negative terminal of the battery.

⚠ (You MUST connect this wire!!)

Siren Enable - Connect terminal 2 to a 10-16VDC ignition switched power source.

⚠ (You MUST connect this wire!!)

Audio Power - Connect terminal 6 to 10-16VDC through a 15A fuse.

⚠ (You MUST connect this wire!!)

Speaker - Connect terminals 3 and 4 to your speaker.

OPTIONAL ELECTRICAL CONNECTIONS

AUX Input - If you will be using the Hands Free option (see page 7) to activate and change siren tones with the vehicle horn, connect terminal 1 to the horn switch. Be sure that you have set DIP switch #1 for the correct polarity (see page 5).

Backlighting - (SS650 Only) Connect terminal D to the Dash Lights, ignition switched power, or other switched 10-16VDC power source. This controls the backlighting for the face of the siren.

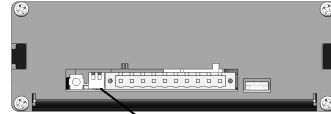
Optional Lights - (LCS652 Only) Connect terminals A and B to any optional 12VDC lights or devices you would like to control with the switches on the front panel.

Light Input Pwr - (LCS652 Only) Connect terminals C and D to a 10-16VDC power source. This supplies power to the lights connected to A and B.

DIP Switch Settings

The SS650 and LCS652 have two optional settings that can be selected during installation using the DIP switches located on the back of the amplifier case:

- Auxiliary Input Polarity
- Hands Free Cyclor Mode Enable

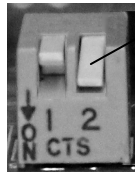
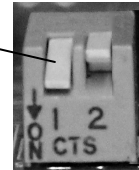


DIP Switches

DIP SWITCH	FUNCTION	UP (Off) <i>(default)</i>	DOWN (On)
1	AUX Wire Polarity	Positive switching	Negative switching
2	Hands Free Cyclor mode	Hands Free Cyclor mode disabled	Hands Free Cyclor mode enabled

DIP Switch 1 - Auxiliary Input Polarity (AUX Function)

Applying a positive voltage to the green wire normally activates the auxiliary function (Air Horn standard/Hands Free Cyclor function optional). If you want the AUX function to activate when the green wire is connected to ground (negative), flip DIP switch #1 into the DOWN (On) position (as pictured to the right).



DIP Switch 2 - Hands Free Cyclor Mode Enable

This siren is shipped with the Hands Free Cyclor mode DISABLED. To enable Hands Free Cyclor mode, set DIP switch #2 into the DOWN (On) position (as shown to the right).

See page 7 for additional details on Hands Free Cyclor mode.

Optional Tone Programming

The SS650 and LCS652 can be programmed to produce 6 different tones/sounds by activating its various functions:

<u>Function</u>	<u>Default Tone</u>
Wail	Wail
Yelp	Yelp
Yelp Step Up	Phaser
Manual	Ramp Up
Horn	Air Horn
Auxiliary	Air Horn

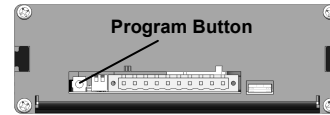


Each of these functions can be programmed for a different tone if desired. If you would like to change the default sounds for any of the six functions, follow the instructions below.

- Power the unit** up.
- Activate the function you wish to change.
 - For Wail and Yelp functions, flip the **Wail/Yelp** switch into the corresponding position.
 - For the Manual, Horn, or AUX functions, press **and hold** the **Manual** button, **Horn** button, or **steering wheel horn**, respectively.
 - For the Yelp Step Up function, flip the **Wail/Yelp** switch into the **Yelp** position, then press and release the **Manual** button.

The tone that is currently programmed for that function will sound.

- Press and release the **Program** button on the rear of the siren to cycle through the list of optional tones. *Review the chart below for a list of optional tones.*
- De-activate the function to save the new tone.



Tones For Wail and Yelp Buttons and Yelp Step-Up Function	Tones For Manual Button and AUX Wire	Tones for Horn Button
1 WAIL (Wail default) §, *, †	1 STANDARD AIR HORN (AUX default)	1 STANDARD AIR HORN (default)
2 YELP (Yelp default) §, *	2 LOW FREQUENCY AIR HORN	2 LOW FREQUENCY AIR HORN
3 PHASER (Yelp Step Up default)	3 RAPID AIR HORN	3 RAPID AIR HORN
4 TWO TONE	4 AIR HORN II	4 AIR HORN II
5 MECHANICAL WAIL (FIRE ENGINE) †	5 DOUBLE POST POP AIR HORN	5 DOUBLE POST POP AIR HORN
6 MAX YELP §, *	6 SINGLE AIR HORN	6 SINGLE AIR HORN
7 HOOT	7 SINGLE QUICK AIR HORN	7 SINGLE QUICK AIR HORN
8 RAPID HOOT	8 TWO TONE AIR HORN	8 TWO TONE AIR HORN
9 AIR HORN & YELP	9 MANUAL (Manual default) *, †	
10 GHOST	10 MECHANICAL MANUAL (FIRE ENGINE) †	
11 RAPID GHOST		
12 SINGLE AIR HORN		
13 SINGLE QUICK		
14 DOUBLE POST POP AIR HORN		
15 TWO TONE AIR HORN		
16 STANDARD AIR HORN		

§ = SAE approved
 * = California Title 13 approved
 † = See below

▶▶▶▶ System Reset ◀◀◀◀

If you would like to reset all of the siren programming options to their defaults, activate any tone and press the **Program button** for six (6) seconds. The LED will flash once, then twice, then all siren tones will stop.

Wind Down or Hard Stop Option

By default, the Wail and Manual tones indicated by the “+” above will “wind down” when they are de-activated. If you prefer to have them immediately stop (i.e. hard stop), hold the Program Button for 3 seconds (until the LED flashes once). This will change them to a hard stop. Repeat to change back to the wind down option.

Operation



Wail/Off/Yelp Switch

This is the 3-position button used for basic operation of the siren. While in the Wail or Yelp positions the siren will produce the tone programmed for that function (*see previous page*). The Wail and Yelp functions are defaulted for the Wail and Yelp tones.

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

Yelp Tone: A rapid warble tone used in light to moderately congested areas.

Center Off Position: (Manual/Standby) - A silent mode that allows momentary push-button activation of the Manual and Horn functions.

Manual Button

With the Wail/Off/Yelp button in the **Off position** (unit powered up but not producing any siren tones): Pressing the momentary Manual push button switch will provide a manually rising and falling siren tone while being pressed. The siren output *winds down* when the Manual momentary switch is released.

With the Wail or Yelp mode selected: Pressing the Manual button will “step” the siren up to the next button’s programmed tone:

(Wail➔Yelp➔Yelp Step Up)

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 Manual button again, reverts the siren back to the original tone. (*See previous page to program optional tones.*)

Horn Button

This momentary push button switch provides a simulated air-horn tone while pressed. It is useful at intersections or in high noise areas. This tone will override all other siren tones. (*See previous page to program optional tones.*)

Auxiliary Function (AUX Wire) and Hands Free Cyclor Mode

Note: Requires connection of the AUX wire (see page 4).

The AUX wire is typically connected to the vehicle horn switch. See page 5 to select either positive (+12VDC) or negative (ground) activation.

Normally when the unit is on and in any mode, activating the AUX wire (i.e. pressing the vehicle’s horn) will produce the programmed Air Horn tone (*see previous page to program optional Air Horn tones*).

If you enable *Hands Free Cyclor mode* using DIP switch #2 as shown on page 5, pressing the vehicle’s horn continuously for 3 seconds will activate the **Hands Free Cyclor mode**. This mode allows you to use the vehicle’s horn to cycle through the siren tones associated with the following functions:

(Wail➔Yelp➔Yelp Step Up➔Silent)

(Operation CONT'D)

Light Control Switches (LCS652 only)

The LCS652 also has two additional switches located in the center of the face (SW1 and SW2). These two switches will control external devices (usually lights).

SW1 controls the device connected to Terminal A on the rear connector. SW2 controls the device connected to Terminal B.



Please Note: Terminals C and D of the connector (LCS652 only) supply the power for the devices switched by SW1 and SW2. Connect these terminals through an appropriate user supplied fuse (up to 10 amps each). 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.



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Troubleshooting

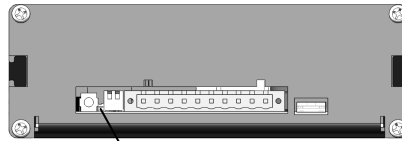
Auto Shutdown

This unit is designed to automatically shut down when certain undesirable conditions exist to prevent internal damage. All audio functions are disabled until the issue is corrected.

- Over Voltage/Under Voltage
- Over Current

Micro Feedback LED

This unit is designed with an LED that not only provides feedback when programming, but also helps troubleshoot audio issues.



Micro Feedback LED

LED Pattern

Steady On
Off
Single Flash
Double Flash

Diagnosis

Speaker functioning properly
No Siren Tone Active or Speaker open (faulty connection)
Over Voltage/Under Voltage
Over Current

Symptom	Possible Cause	Check
No power	Check power Wires Fuse or circuit breaker blown	When activated, power to both Terminals 2 and 6? Is power hooked up backwards? Positive ground vehicle? Are the negative leads connected to a good ground? Measure voltage between ground & +12v terminal Measure voltage between ground & ignition switched terminal. Check Fuse under amplifier cover. Check external fuses or circuit breakers
No siren tone	Bad speaker or speaker wiring High voltage or low voltage protection Blown Fuse	Does LED remain off when siren tone is selected? Disconnect the speaker at the amplifier, and turn a tone on. If you hear sound, the siren is working correctly and you have a failed speaker or faulty speaker wiring . Is LED single flashing? Measure voltage between ground & ignition switched terminal. The input voltage must be between 10 & 16V Check fuse inside amp housing
Distorted siren sound	Speaker assembly loose Intermittent AUX input connection Low or high vehicle voltage	Is the speaker loose? Is the Aux. Input used and wired properly? Is LED single flashing? Input voltage must be between 10 & 16 volts while siren is on.
Intermittent siren tone	Low voltage protection Circuit breaker in supply connection Shorted speaker or speaker wire	Wires connected tightly to the back of the unit? Loose connection on a power lead? Input greater than 10V with the siren turned on? Is a circuit breaker used with at least a 30A rating? Does the speaker have water damage, or is a wire pinched?
Horn function or Manual function stuck on	Aux. Input improperly connected or Aux. Input Polarity Option set wrong	Remove the Aux input wire at the amp. Does the problem stop? If so the aux polarity may be set wrong or the aux wire may be wired incorrectly
Wrong siren tone	Option accidentally changed	See programming and setting to defaults section

Parts

Part	Description
S30235-19	Amplifier Top Cover
S30234-19	Amplifier Bottom Mounting Plate
SWH-152	Optional Wiring Harness <i>(not included)</i>
30052-30	Rear Amplifier Case Screws
P30028-27	15 Amp Mini 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)

Service

ONE YEAR LIMITED WARRANTY

The manufacturer warrants each new product against factory defects in material and workmanship for one year after the date of purchase. The owner will be responsible for returning to the Service Center any defective item(s) with the transportation costs prepaid. The manufacturer will, without charge, repair or replace *at its option*, products, or part(s), which its inspection determines to be defective. Repaired or replacement item(s) will be returned to the purchaser with transportation costs prepaid from the service point. A copy of the purchaser's receipt must be returned with the defective item(s) in order to qualify for the warranty coverage. Exclusions from this warranty include, but are not limited to, bulbs, strobe tubes, domes, and/or the finish. This warranty shall not apply to any light, which has been altered, such that in the manufacturer's judgment, the performance or reliability has been affected, or if any damage has resulted from abnormal use or service.

There are no warranties expressed or implied (including any warranty of merchantability or fitness), which extend this warranty period. **The loss of use of the product, loss of time, inconvenience, commercial loss or consequential damages, including costs of any labor, are not covered.** The manufacturer reserves the right to change the design of the product without assuming any obligation to modify any product previously manufactured.

This warranty gives you specific legal rights. You might also have additional rights that may vary from state to state. Some states do not allow limitations on how long an implied warranty lasts. Some states do not allow the exclusion or limitation of incidental or consequential damages. Therefore, the above limitation(s) or exclusion(s) may not apply to you.

If you have any questions concerning this or any other product, please contact our **Customer Service Department** at (585) 226-9787.

If a product must be returned for any reason, please contact our Customer Service Department to obtain a Returned Materials Authorization number (RMA #) before you ship the product back. Please write the RMA # clearly on the package near the mailing label.



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