

INSTALLATION & OPERATION GUIDE

SI-250



Systems Integration Amplifier™



BLENDING HIGH FIDELITY AND ARCHITECTURE™

CONGRATULATIONS!

Thank you for purchasing the Niles SI-250, one of the most flexible and convenient amplifiers ever offered. Like all Niles products, the SI-250 is built to the highest standards of quality control and reliability. With proper installation and operation, you'll enjoy years of trouble-free use.

Niles manufactures the industry's most complete line of custom installation components and accessories for audio/video systems. For a free full line catalog write:
Niles, Catalog Request, P.O. Box 160818, Miami, Florida 33116-0818

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INTRODUCTION

The SI-250 is a member of the award-winning Niles Systems Integration Amplifier family. It is designed for home theaters and whole house audio systems requiring high power. Niles specifically created Systems Integration Amplifiers to solve the problems of interfacing with different brands and models of equipment, different acoustic environments in different rooms, and different kinds of applications; home theater, stereo, and background music. The SI-250 brings extremely high-current power to a custom installed A/V System in a remarkably convenient way.



SI-250
*High Power, Bridgeable
Stereo Amplifier*

FEATURES AND BENEFITS

Real World Power

The SI-250 delivers 125 watts per channel at eight Ohms, 185 watts per channel at four Ohms and is stable into a two Ohm load. You'll get great bass and phenomenal imaging from every pair of speakers powered by an SI-250.

Bridges to Mono

By combining the SI-250's two 125 watt channels into one, you create a mono 395 watt amplifier. Subwoofers and center channel speakers in large home theaters will especially benefit from a bridged SI-250.

Transparent Sound

The audio circuitry of the SI-250 is constructed with the finest parts available; including 1% metal film resistors, high quality capacitors, and oversized heat sinks. All this attention to technical detail creates a sound that is clear and uncolored.

Freedom from Fan Noise

The oversized heat sinks inside the SI-250 allow the amplifier to stay cool even when operating into low impedance loads—without the noise of fan-cooled amplifiers.

Independent Level Controls

Each channel has its own independent level control enabling you to precisely match the SI-250 to the rest of your system. The level controls also enable you to limit the volume, preventing abuse of the system.

Turn-On Modes

The SI-250 features three turn-on modes: 1. Music Sense 2. External Voltage Trigger 3. Manual Turn-On via the front panel switch. You can configure the SI-250 to interface with any kind of system and have the unit automatically turn on.

Automatic Protection

The SI-250 is equipped with sophisticated protection circuits. In the unlikely event that a problem occurs, the amplifier shuts itself off. When conditions return to normal, regular operation resumes.

Status Display for Troubleshooting

LED's on the front panel indicate Power, Active Status, Clipping, Protection Warnings, and the Fuse Status. With a glance at the front panel, a troubleshooter is quickly provided with key information!

Control Output

A 12 volt DC output is provided whenever the amplifier is on, allowing you to operate voltage-triggered devices like motorized screens and curtains.

AC Power Convenience Outlets

Both switched and unswitched AC power outlets are provided on the rear panel. The switched outlet is activated whenever the SI-250 is on. This allows another component to benefit from the SI-250's Auto Turn-On circuitry.

Designed and Engineered in the USA

Limited two year parts and labor Warranty.

INSTALLATION CONSIDERATIONS

Placement

Place the SI-250 on a flat level surface like a table or shelf. It should be placed upright so that its weight rests on the four attached feet. Placing the weight of the amplifier on the rear or front panel for even an instant will result in damage to the amplifier's connectors and controls.

The SI-250, like any hi-fi component, will last much longer if it is given adequate ventilation for proper cooling. When installing the SI-250 in a cabinet, be sure that the rear of the cabinet is open to fresh air to provide proper cooling (see **Figure 1**). If the cabinet's design will not accommodate an open rear, install two small "boxer fans" to provide continuous air flow into and out of the cabinet (see **Figure 2**). Place the SI-250 so that there is at least 1-1/2" of free air space above the chassis. If the amplifier is located on a carpeted surface, place a board under the amplifier's feet. Do not block the ventilation holes on the top and bottom of the SI-250.

The SI-250 is equipped with a massive toroidal power transformer. This transformer generates a powerful magnetic field which could induce hum in a turntable (particularly a turntable equipped with a moving coil cartridge). Do not place a turntable directly above or directly adjacent to the SI-250.

Figure 1

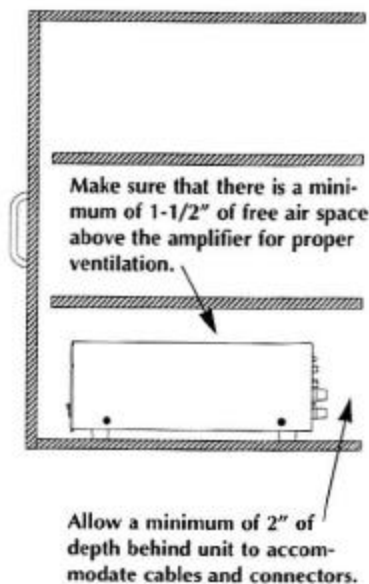
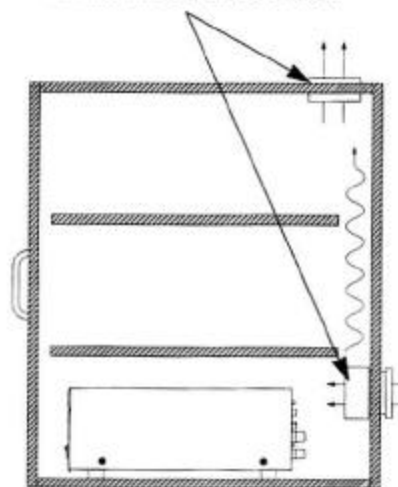


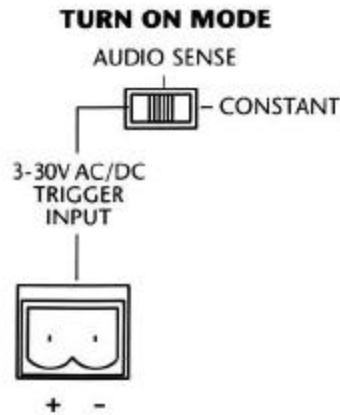
Figure 2

If the cabinet rear is not open to fresh air, install two small "boxer fans" to provide continuous air flow into and out of the cabinet.



Turn-On Modes

The SI-250 draws more current than a preamplifier's switched AC outlet can safely supply. Also, your preamplifier may "thump" at dangerous volumes if the amplifier is already on when the preamp turns on. It is usually best to turn the amplifier on only when it is needed. The Turn-On Mode selector switch gives you three options for turning "On" and "Off" the SI-250.



Constant - The auto turn-on circuitry is off. The front panel master power switch operates the amplifier. Up is "On", down is "Off".

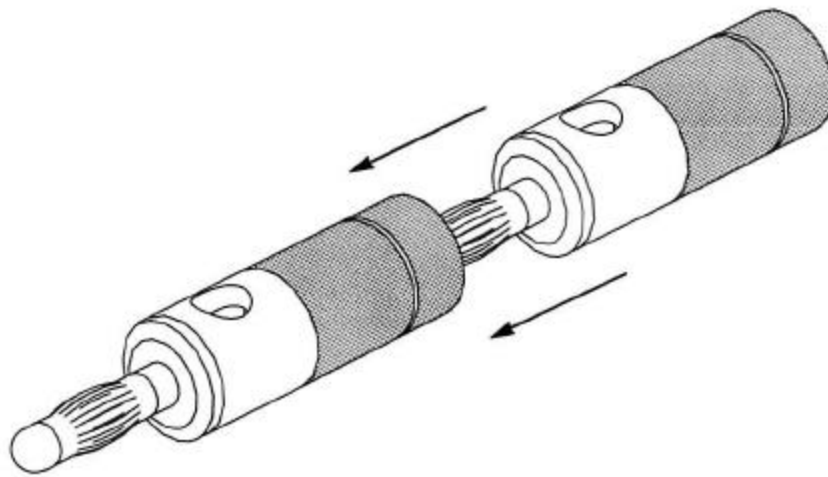
Audio Sense - The master switch on the front panel must be in the "On" position. The amplifier is off when there is no audio signal present at either the left or the right input, but the sensing circuitry is on. The turn-on sensing circuitry looks for a tiny amount of audio signal present at any of the audio inputs. If it detects a signal, the amplifier is turned on. Once the audio signal stops, the sensing circuit waits three minutes, then turns the amplifier off.

3-30 Volt AC/DC Opto-Isolated Voltage Trigger - The master switch on the front panel must be in the "On" position. The amplifier is off when there is no 3-30V AC or DC voltage detected at the trigger input. Once the sensing circuitry detects a voltage, the amplifier is turned on. Once the voltage stops, the sensing circuit instantly turns the amplifier off. Voltage triggers can be supplied by Niles automated switches, some video projectors, some surround sound processors, or something as simple as a 16 volt AC wall adapter (Niles XF00008) plugged into the switched outlet of your stereo receiver. **DO NOT USE A DC WALL ADAPTER.** The long discharge time of the DC adapter's filter capacitor will delay the turn-off of the amplifier.

If you are using a wall adapter or external power supply to provide the trigger, it doesn't have to be very large (a minimum current capability of 2.5 milliamps for a 3 volt trigger increasing up to a minimum of 38 milliamps for a 30 volt trigger).

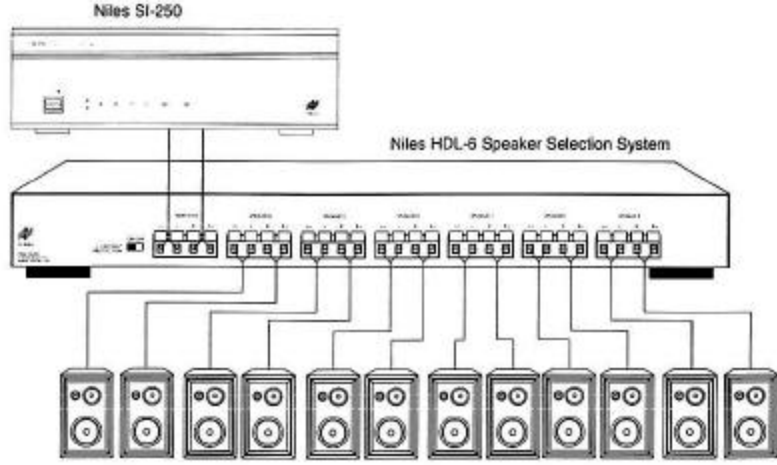
Multiple Speaker Loads

The SI-250 is stable into very low impedance loads. This means you can safely operate three pairs of 8 ohm speakers (a 2.67 ohm load) directly connected to the SI-250. However, the cable from three pairs of speakers will be too bulky to fit into the speaker terminals at once. Niles makes a premium gold plated solderless banana plug. This plug has a jack on the end, so additional plugs can be added one behind the other, without tangles of wire or solder.



Niles banana plugs daisy-chain together.

Niles makes a number of different speaker selection and impedance matching systems. These speaker selectors provide an easy way to terminate all of the wires for a houseful of speaker systems. Testing and troubleshooting a new system is much easier with the individual room labels and on/off switches of a Niles speaker selection system. Speaker selection systems allow each pair of speakers to be turned on and off from your equipment location (or even via remote control). That way, you know that the speakers in the bedroom are off so you can avoid waking a sleeping spouse! Additionally, Niles speaker selection systems offer impedance matching features which will allow you to connect up to ten pairs of speakers to your SI-250 amplifier.



Speaker selection systems allow each pair of speakers to be turned on and off from your equipment location (or even via remote control).

Convenience Outlets

There are two convenience outlets on the rear panel of the SI-250, Unswitched and Switched. The combined load of all appliances connected to the SI-250's convenience outlets CANNOT exceed 750 watts.

Unswitched – If the SI-250 is plugged in, regardless of whether it is on or off, the unswitched outlet is active. The unswitched outlet is appropriate for any component or appliance you would like to manually turn on and off, regardless of whether the amplifier is on or off, or any component, such as a VCR, that has a clock in it.

Switched – Only if the SI-250 is actually on or active is the switched outlet "On". Because of the SI-250's unique turn-on modes, this outlet allows other components or appliances to operate in sync with the SI-250. For instance, a powered subwoofer or rear channel amplifier could be turned on and off by the SI-250 whenever an audio signal is detected by the SI-250's audio sense turn-on mode. The switched outlet allows you to control any component that is of the "latching" power type.

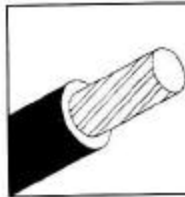
Try this test, if you are not sure whether the component you want to control is "latching". Turn on the component. Carefully remove the AC plug from the wall receptacle. Wait five minutes. Plug the AC cord back into the wall receptacle. If the component turns on, it is of the "latching" type. If the component still requires a push button or remote command to turn on, it is not suitable to be controlled by a switched outlet.

Cable and Wire

It will be easier to reconfigure or troubleshoot your system in the future if you label the cables and wires for their destination or source, rather than which terminal of the SI-250 they are connected to.

The SI-250 connects to your sources via shielded line level audio cables with RCA phono plugs. Use high quality cables with your Niles amplifier for the lowest possible noise and best overall performance. Your Niles dealer can recommend the proper cable.

The SI-250 connects to your speakers using 2 conductor speaker wire. For most applications, we recommend you use 16 or 18 gauge wire. For wiring runs longer than 80 feet, we recommend 14 gauge wire. The binding posts of the SI-250 will accommodate up to 12 gauge wire. Larger sizes can be accommodated by attaching banana plugs to the wire. Note that the binding posts do not accept dual banana connectors, only single connectors.



TECH TIP

Wire size is expressed by its AWG (American Wire Gauge) number. The lower the number, the larger the wire, i.e. twelve AWG is physically larger than fourteen AWG.

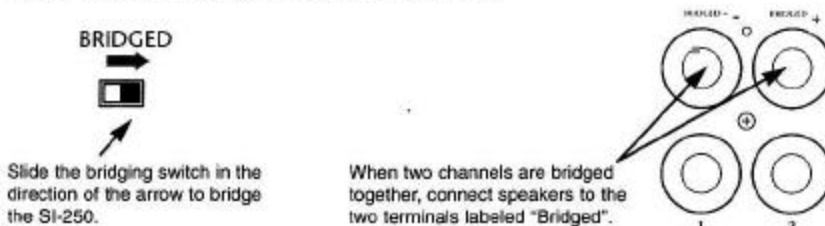
INSTALLATION

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CAUTION! ALL CONNECTIONS AND REAR PANEL SWITCH SETTINGS SHOULD BE DONE WITH THE FRONT PANEL MASTER POWER SWITCH OFF.

Bridging The SI-250 to Mono

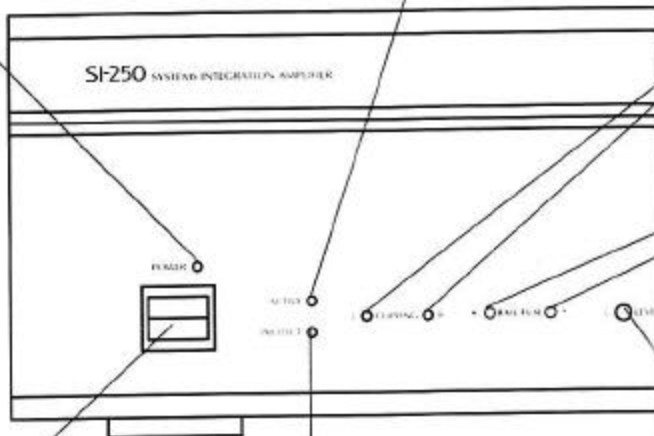
The SI-250's bridging switch allows you to create a powerful mono amplifier by combining or "bridging" two adjacent channels.



STEP	DESCRIPTION
<p>1. Move the bridging switch to the "Bridged" position (toward arrow).</p> <p>CAUTION! DO NOT CONNECT A SPEAKER LOAD OF LESS THAN EIGHT OHMS TO A BRIDGED SI-250.</p>	<p>The SI-250 should be off and disconnected when moving the bridging switch.</p> <p>The impedance of the speaker load connected to a bridged amplifier is halved, so you must ensure that the overall impedance of the speaker(s) running off that channel is 8 ohms or higher to avoid damage to the amplifier through overheating.</p>
<p>2. Connect the speaker wires to the two Bridged speaker terminals (BRIDGED -, BRIDGED +).</p>	<p>Connect your speaker wire only to the red terminals of the two adjacent amplifier channels. If one of the speaker wires touches a black terminal (thereby grounding the red "hot" terminals) you will short circuit the amplifier.</p>

Red "Power" LED confirms the amplifier is connected to a live AC power outlet. (and that the master power switch is on).

Green "Active" LED lights when the amplifier circuitry has been turned on by the Turn-On circuits.



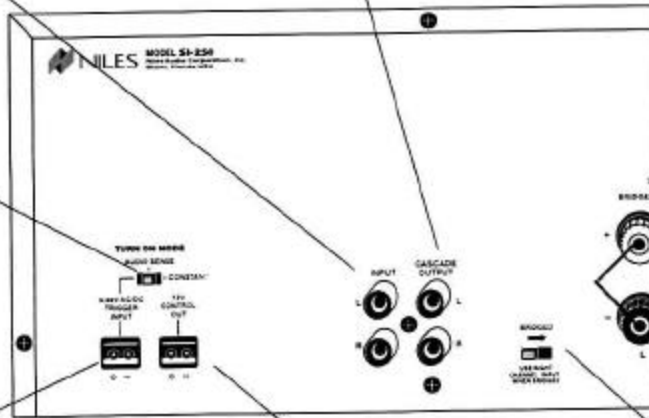
Front panel "Master Power" switch turns off the entire amplifier, including the Turn-On circuitry.

The red "Protect" LED indicates the amp has shut down because there is a fault in the speaker, the wiring, or with the SI-250 itself.

Main inputs enable you to route a stereo line level source to the SI-250.

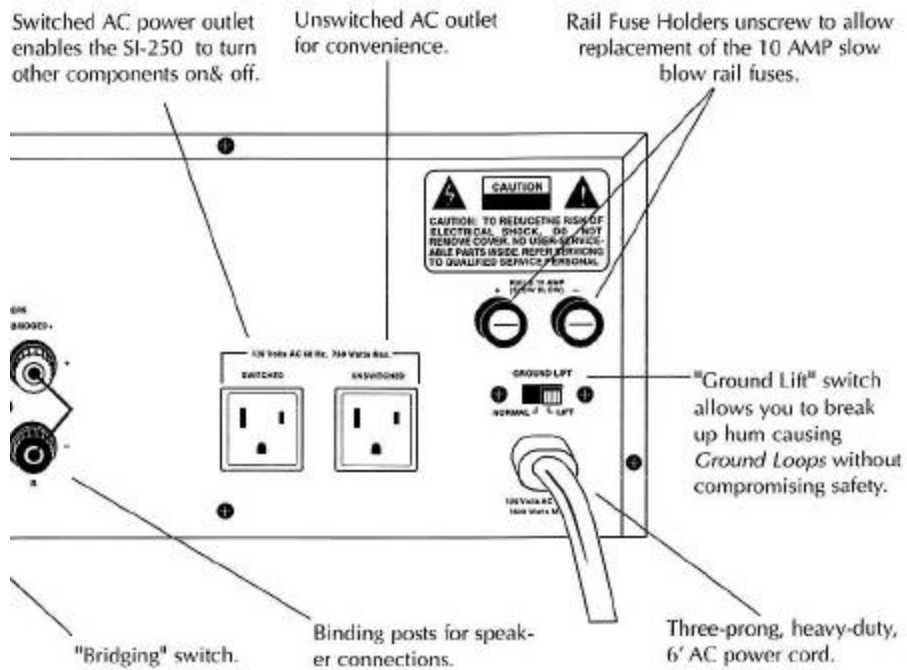
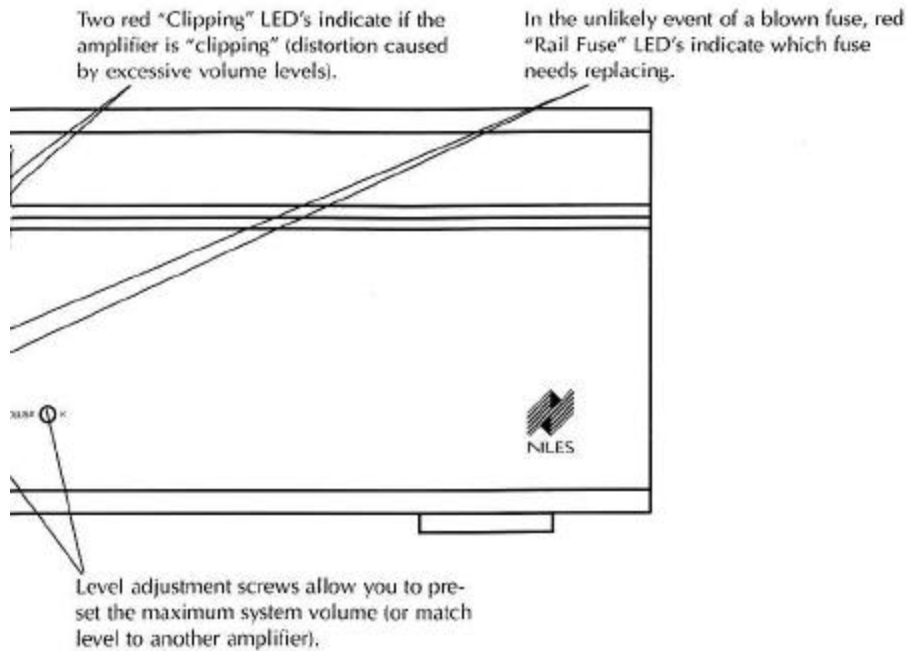
Cascade Outputs of the main input enable you to daisy chain multiple amplifiers.

"Turn-On Mode" switch



Two-piece removable connector for voltage input.

Two-piece removable connector for 12v DC Control output.

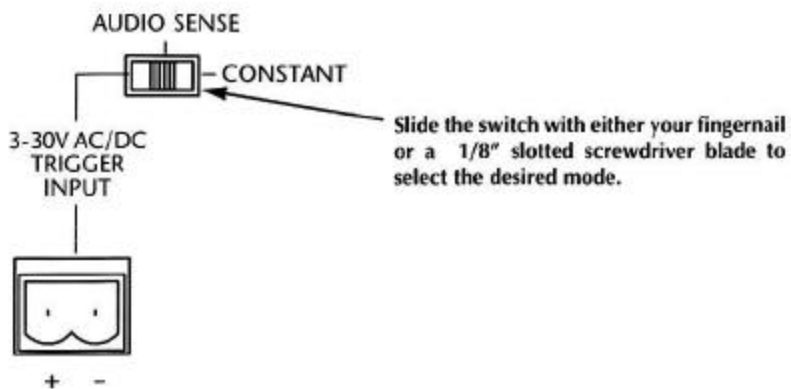


Bridging The SI-250 to Mono (continued)

STEP	DESCRIPTION
<p>CAUTION! Do not connect the speaker wires to a ground connection when the amplifier is "Bridged".</p>	<p>Once the amplifier is in the bridged position the speaker wires utilize a "floating" ground. If you attempt to use a headphone junction box or a non-Niles speaker selector or volume control while your SI-250 is in "Bridged" mode you will short circuit the amplifier. All current Niles speaker selectors, impedance matching devices and volume controls (except for the SCW-2, which has a headphone outlet) have independent ground returns for each channel and are safe for use with bridged amplifiers.</p>
<p>3. Use the right channel input and level control for connections and configuration.</p>	<p>The unused LEFT channel input level control can be in any position, only the RIGHT channel level control affects the volume of a bridged SI-250.</p>

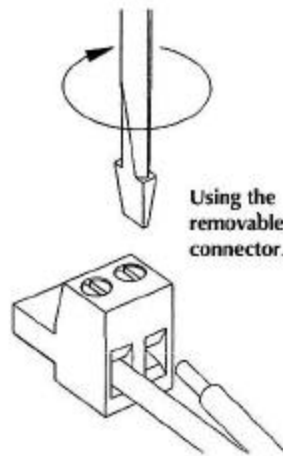
Setting the Turn-On Mode Switch

The SI-250 has three turn-on modes. Select which mode you desire by sliding the mode switch. See Installation Considerations on page 6 for more information about each of the turn-on modes.



Control Output

This terminal provides a 12v DC signal suitable for triggering Niles automated switchers, some motorized screens, some electric curtain controls, etc. The trigger voltage is present only when the amplifier is active or "on". When the amplifier turns "off", the 12 volt signal is off.



STEP	DESCRIPTION
1. Check the requirements of the device you want to control.	The control output has a maximum current capability of 150 mA.
2. Connect the two conductors to the Control Output maintaining proper polarity. The connector for the Control Output is a two piece removable connector.	<p>A. Remove the connector by pulling it away from the amplifier.</p> <p>B. Strip off the last 3/8" of each of the two conductors supplying the voltage and twist the strands of wire together.</p> <p>C. Insert the bare wire ends into the connector. Tighten the screws at the top of the connector with a 1/8" slotted screwdriver, then plug the connector into the receptacle on the amplifier.</p>

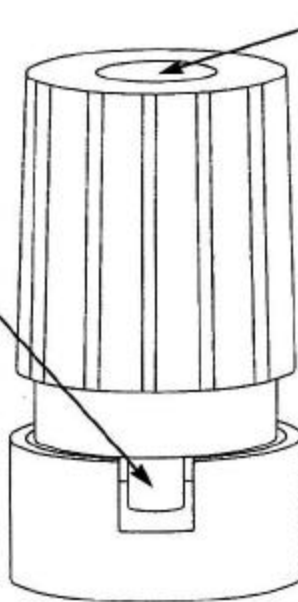
The Installation Section continues on page 15.

Speaker Wire Connections

CAUTION! All speaker wire connections must be made with the amplifier Off.

Bare Wire

Unscrew the red or black plastic knob, insert the bare wire end into the opening, and then tighten the knob until the wire is securely clamped.



Banana Plugs

There are many types of banana plugs, some crimp, some solder. The Niles gold banana plug has a binding post for the bare wire on the body of the plug. A banana plug is simply inserted into the jack at the end of the amplifier's binding post. Dual banana plugs will not fit the SI-250 binding posts.

STEP	DESCRIPTION
1. Label all wires.	If you label the wires for their destination, rather than which terminal of the SI-250 they are connected to, it will be easier to reconfigure your system in the future.
2. Connect one stripped wire end or banana plug to the black terminal and one to the red terminal. CAUTION- Avoid even a single strand of wire touching the chassis or another connector.	<p>A. Split the speaker wire insulation so that at least two inches of each conductor are separated.</p> <p>B. Strip one half inch of insulation from the end of each conductor of the speaker wire</p> <p>C. Attach banana plugs or twist the strands of wire together and insert them into the appropriate binding post.</p>

Line Level Audio Inputs


CAUTION! THE AMPLIFIER MUST BE OFF WHENEVER YOU MAKE CHANGES TO THE INPUT CONNECTIONS.

STEP	DESCRIPTION
<p>1. Label all of the interconnecting cables for the sources they connect to.</p>	Use audio patch cables with RCA phono plugs attached to the ends.
<p>2. Connect the sources by inserting the RCA plug into the amplifier's jacks.</p> <p>NOTE: If you are using the two amplifier channels in "bridged" mode connect the input cable to the RIGHT amplifier input jack.</p>	Connect output from your sources to inputs on the amplifier, never connect inputs on a source or preamplifier's input (e.g. record inputs) to the inputs of your SI-250.

Cascade Audio Outputs

The "Cascade Audio Outputs" enable you to connect another amplifier to your preamplifier output. The connectors are gold-plated RCA phono jacks. Connect them to another amplifier's inputs with a standard audio patch cable. The outputs are not buffered; if you wish to daisy-chain more than 5 Niles amplifiers you will need a Niles ADA-6 buffered distribution amplifier. A single ADA-6 will allow you to daisy-chain 5 amplifiers from each of its six outputs, allowing 30 SI-250 power amplifiers to be fed from the same master preamplifier. If your preamp has a vacuum tube output stage, you must use a Niles ADA-6 to drive more than a single SI-250.

AC Power Plug

STEP	DESCRIPTION
<p>Plug the attached 3 prong plug into a correctly grounded 120V 60Hz wall outlet.</p> 	<p>If you use a power strip, surge suppressor or extension cord, verify that proper ground is maintained.</p>
<p>CAUTION! Do not use an ungrounded two prong outlet, cord, or strip.</p>	<p>For maximum performance and for your safety, the amplifier must be grounded.</p>
<p>CAUTION! Do not plug the amplifier's cord into a preamplifier's convenience outlets.</p>	<p>The SI-250 draws approximately 810 watts at full power. This is much more than the typical accessory outlet on the back of a component will provide. Use the SI-250's auto turn-on circuitry to turn on the SI-250 whenever the preamp is on.</p>

Ground Lift Switch

The "Ground Lift" switch should be in the "Normal" position before turning on the amplifier for the first time. The ground lift switch can potentially eliminate hum producing ground loops without compromising safety. The amplifier's chassis is always connected to the third prong. The switch simply isolates the circuit ground from the chassis. If you notice a hum from the speakers try the "Lift" position.

Rail Fuse Holders

Unscrew the holders with a standard slot blade screwdriver. These fuses blow to prevent damage to the amplifier. Replace them only with 10 amp slow blow fuses. Substitution of a larger fuse size may seriously harm your amplifier and will void your Niles warranty.

OPERATION

Power Switch

The front panel switch is a master or "vacation" power switch. No matter which turn-on mode you have selected, the master power switch will turn off all circuitry—including the sensing circuitry. If you will not be using the amplifier for an extended period of time, turn the master power switch "Off" (push the rocker switch down). When you would like to return to normal operation, turn the switch "On" (push the rocker switch up).

Power LED

The power LED indicates that the AC cord is plugged into a working AC power receptacle and that the power switch is in the "On" position.

Active LED

The rear panel turn-on mode switch determines when and how the amplifier will turn on. The "Active" LED indicates that the amplifier is operating.

Protection LED

The front panel protection LED indicates that the amplifier has been shut down because of either a fault in the wiring or the speaker, or with the SI-250 itself.

Rail Fuse LED's

The front panel rail fuse LED's indicate that the amplifier has been protected from a simultaneous short across one of the channels or some other very serious problem. Your system should be checked to determine and rectify the cause, before replacing the 10 amp slow blow fuses.

Clipping LED's

It is possible (even if you are not a teenager) to turn the volume so high that the amplifier runs out of power. This creates "clipping" distortion. The clipping LED's light to warn you that you are overdriving your amplifier. It is unlikely that an "instant" of clipping distortion will be noticed or create any problems with your

speakers. However, if the clipping LED's light constantly, turn the volume down immediately! If you continue to operate the amplifier at "clipping" power levels the protection circuits will operate when the amplifier overheats. The protection circuits reset when the amplifier's internal circuitry cools. Reduce the volume to prevent a reoccurrence. Perpetually overdriving your speakers and amplifier is abuse and probably voids the manufacturer's warranty of all affected products.

Level Adjustment Screws

The front panel level adjustment screws allow you to adjust the level of the SI-250 relative to other amplifiers in your system. Use a 1/8" slotted screwdriver to adjust the screws. If the SI-250 is the only amplifier in your system, leave the screws at their factory default position (turned fully clockwise).

Cleaning and Maintenance

The internal parts of the SI-250 are electronic and require no maintenance. Once a year it is appropriate to twist the RCA connectors on each input to remove corrosion and improve conductivity.

You can clean the amplifier with soft cloth or paper towel dampened with water or a mild detergent. Do not use any spray-type, abrasive cleaners on the amplifier.

TROUBLESHOOTING GUIDE

When there is a problem consult this guide first. If the problem persists, or you have additional questions, call your local Niles dealer or Niles Technical Support at 1-800-289-4434. The most common problems relate to hook up. Call from your telephone extension nearest the system.

SYMPTOM	POSSIBLE CAUSES AND TEST PROCEDURE
<p>No sound on one channel</p>	<p>Short circuit or loose wire at speaker or amplifier terminals. Check connections are secure and for loose strands of wire crossing from the positive to the negative at the back of the amplifier and the speaker.</p> <p>Short circuit or a break in the speaker wire. Disconnect the speaker wire at both ends, separate the 2 conductors at both ends and test with a meter for a short circuit. If there is no short, connect the two conductors at one end and test with a meter for continuity.</p> <p>Speaker is not working. Connect the speaker to a channel that plays another speaker.</p> <p>Audio cable to input is bad. Connect another cable that is known to be good.</p> <p>Bridging Switch is in the wrong position.</p>
<p>No sound on both channels</p>	<p>Audio cable to the main inputs is bad. Connect another cable that is known to be good.</p>
<p>Hum from the speakers</p>	<p>The ground lift switch can potentially eliminate hum producing ground loops without compromising safety. The amplifier's chassis is always connected to the third prong. The switch simply isolates the circuit ground from the chassis. Before turning on the amplifier for the first time, check that the switch is in the "Normal" position. If you notice a hum from the speakers try the "Lift" position.</p> <p>Hum may be caused by a ground loop between two of the other components in the system. To test for another ground loop, return the switch to the normal position and try reversing the AC plugs of each of the components in the system.</p>

TROUBLESHOOTING GUIDE (continued)

SYMPTOM	POSSIBLE CAUSES AND TEST PROCEDURE
Hum from all of the speakers	Check for faulty cables, faulty source material, an ungrounded phono system or a defective component.
Amp will not turn on	AC power cord must be plugged into a working outlet. Master power switch must be on. Test that the AC power receptacle is working. If the outlet tests O.K., the internal fuse is blown. Return the amplifier to your dealer for service.
Bass sound is weak and the stereo image is "phasey" or "blurry" sounding in one room	Check that the bridging switch is "Off". If the amplifier is connected normally but the bridging switch is set to the "Bridged" position, the two speakers will play out of phase with each other. The loudspeakers are wired out of phase. Reverse the connections at the back of one speaker.

SPECIFICATIONS

Design Principle

Linear voltage/current amplification.

Continuous Average Power Output

(unbridged) 125 watts per channel RMS at 8 ohms.
185 watts per channel RMS at 4 ohms.

Bridged Power Output

395 watts per channel RMS at 8 ohms.

Input Impedance

56K ohms

Input Sensitivity

.985V for 8 Ω rated output

Overall Voltage Gain

30.13 dB

Frequency Response

Bandwidth Limited from 5 Hz to 50 kHz

Total Harmonic Distortion**8 Ohms**

.01% THD at 1 kHz @ full rated power

.08% THD from 20 Hz to 20 kHz @ full rated power

4 Ohms

.02% THD at 1 kHz @ full rated power

.14% THD from 20 Hz to 20 kHz @ full rated power

Overall Dimensions

17" wide x 5 1/2" high (including feet) x 15" deep

Weight

28 lbs

POWER DRAW - 850 WATTS.