GTS150
2/1 CHANNEL AUTOMOTIVE POWER AMPLIFIER
OWNER'S MANUAL

JBL

GTS150

Features

- 2 / 1 Channel Operation
- Simultaneous Stereo / Bridged Operation
- No Current Limiting
- Minimal Negative Feedback
- Quiet Start Circuitry
- Continuously Adjustable Gain Control
- Rated for 2-ohm operation (non-bridged)
- Pulse Width Modulation (PWM) DC-to-DC Switching Mode, MOSFET Power Supply
- Fully Complimentary, Direct Coupled, Discrete Audio Output Stage
- Low Noise Input Section
- Gold-plated RCA Connectors
- JBL Proprietary, Solid Brass Heavy Duty Screw-down Battery and Speaker Output Connectors
- Input Channel Selector Switch
- Remote Turn On Circuitry with Power On Indicator
- Fully Protected Against All Installation Errors
- Third-order, 18 dB per octave Capacitive / Inductive Power Supply Input Filtering

Owner's Warranty Information Records

Model Number

Serial Number

Dealer Name

City, State, Zip

Sales Receipt Number

Date of Purchase

Specifications

Peak

Maximum Power Output (into 4 ohms)	150 Watts Bridged Mono
Power Output (20-20k Hz, 14.4V battery voltage)	50 Watts × 2 (4 ohms, 0.05% THD)
	75 Watts × 2 (2 ohms, 0.5% THD)
	150 Watts × 1 (4 ohms, 0.5% THD)
Signal-to-Noise Ratio	100 dBA
Frequency Response	10-30k Hz (±3 dB)
Input Sensitivity (for rated power output)	150 mV to 1.5V
Input Impedance	11k ohms
Minimum Speaker Impedance	
Single-ended, non-bridged	2 ohms
Bridged	4 ohms
Power Requirement	11 to 16V DC negative ground
Fuse Size	20A
Size (inches, L × W × H)	11-1/8 × 8-5/8 × 2-3/8

Introduction

Thank you for selecting a JBL power amplifier for your car audio system.

The GTS150 is a sophisticated electronic product. Its advanced circuit design gives it exceptional sound quality. Its rugged mechanical design and elaborate protection circuitry guarantee years of reliable operation. However the GTS150 must be properly installed to realize its full performance potential. Skill with tools, knowledge of mobile DC electrical systems and some experience with car stereo installation are necessary to install this amplifier. **We strongly recommended the installation be done by an authorized JBL dealer.**

Take the time to read ALL of the information in this manual before attempting to install or operate the amplifier. Pay particular attention to the safety precautions.

Plan the complete installation before you start. The routing of wires, the power supply connection points, and the mechanical installation of the amplifier should be completely planned before beginning the installation. Work carefully and check each step as it is performed. Before operating the amplifier, recheck the installation, especially the wiring, to ensure that each connection is correct and secure.

Associated Equipment

The GTS150 is compatible with most car audio equipment. However, there are a few factors that should be considered when selecting the speakers and electronics that will be used.

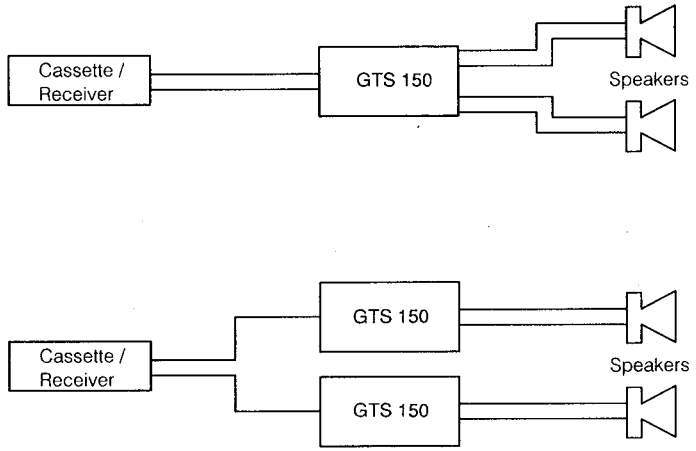
The GTS150 can deliver 75 watts per channel into two channels or 150 watts into one channel. Be sure the speakers can handle such power levels.

When the GTS150 is used in the two channel mode, the impedance of the speakers connected to it must be at least 2 ohms. When the bridged mono mode is used, the impedance of the speaker connected must be at least 4 ohms. Lower impedances may trigger the amplifier protection circuits.

The GTS150 is also capable of operation in a Simultaneous Stereo / Bridged mode. This enables the user to run a complete system with one pair of stereo tweeter / midrange satellites, plus a bridged mono subwoofer, off of one amplifier. For details, see page 12.

The GTS150 must NOT be connected to speakers that have one of their input terminals wired to the frame of the speaker or to the chassis of the vehicle. Use only speakers that have complete electrical isolation between the speaker signal wiring and the frame of the speaker and/or the chassis of the vehicle.

The preamp level outputs of almost any head unit that has them can be used to drive the GTS150. The gain control is used to match the sensitivity of the amplifier to the output voltage of the signal source. This matching is important to keep overall system noise levels low. See the "Operation" section of this manual for information on setting the input level control.



A single GTS150 may be used to drive a pair of speakers. Or the system power level can be doubled by using two GTS150's, in bridged mode, to drive the speakers.

Installation Precautions

Before beginning the installation of the GTS150, read all the following precautions carefully. Failure to heed these warnings could result in PERSONAL INJURY or DAMAGE TO PROPERTY.

The GTS150 should be installed only in vehicles that have 12 volt negative ground electrical systems. Connection to other types of systems may damage the amplifier and/or the vehicle's electrical system.

Before drilling holes for the amplifier mounting screws, inspect the mounting area carefully to be sure there are no critical components such as electrical wires, hydraulic brake lines, fuel lines, or fuel tanks that may be damaged when drilling the holes. Damage to any of these components can be extremely hazardous. Such components may be hidden within double-walled panels or structural members of the vehicle, so be extremely cautious.

Wear eye protection whenever cutting, drilling or filing any part of the vehicle.

Do not hypass or modify the fuse in the +12 volt power supply wire. Do not replace the fuse with a fuse rated for higher current levels. Doing so could result in damage to the amplifier and the vehicle's electrical system and could be extremely hazardous. Repeated blowing of the power supply fuse indicates improper operation or installation of the GTS150. NOTE - An additional power supply fuse should be located as close as possible to the battery power supply connection point in order to prevent electrical system damage or fire in the event of damage to the power supply wire. Use a 20A fuse in this additional fuse holder.

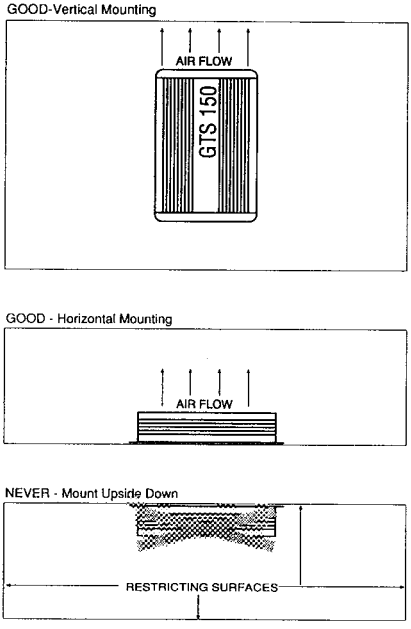
Physical Installation

Several factors should be considered when selecting a mounting location for the GTS150. The amplifier must be solidly mounted in the passenger or trunk compartment where it will not be subject to excessive shock and vibration. Never mount the amplifier where it will be exposed to moisture or extreme heat. Try to mount the GTS150 where the main +12 volt power supply wire, which must be connected directly to the battery, can be kept relatively short.

The GTS150 must be mounted where there is room around the chassis to allow air circulation.

There are three recommended positions for installation the GTS150. One best position is on a vertical surface with the heat sink fins oriented vertically. Another best position is on a horizontal surface that has a fair amount of space above it such as son the floor of the trunk. An acceptable choice is vertical mounting with the heat sink fins positioned horizontally. Using these installation positions will make the amplifier operate at lower temperatures and reduce the risk of triggering the thermal protection circuit.

Whenever possible, chose a mounting location that allows access to the amplifier's wiring connections and level adjustments. This accessibility allows the GTS150 to be mounted first and the wiring connections and level adjustments to be made later.



Mounting

Before mounting the GTS150, review the "Installation Precautions" and "Physical Installation" sections of this manual to select the best mounting location.

Place the amplifier in the mounting location and use a marking pen to mark the positions of the four mounting screw holes in the amplifier end panel flanges. Set the GTS150 aside and drill the four mounting screw holes with an appropriate size bit. Note: If the holes are drilled in metal panels that may be exposed to moisture, treat them with a rust prevention compound.

Set the GTS150 in the mounting position and align the holes in the end panel flanges with the holes previously drilled. Drive the four self tapping sheet metal screws into the mounting panel. Using lock washers under the screws will ensure a strong, vibration resistant mounting. Tighten the screws evenly until the unit is solidly mounted.

Wiring

Proper wirint of the GTS150 and associated components is extremely important for both initial performance and long-term reliability. Using the proper type of wire is equally important. If the power supply wires must be run outside the passenger or trunk compartments, use heat and chemical resistant automotive wire. Regular wire will not withstand exposure to heat and chemicals. Audio signal wires should never be run outside the passenger/trunk compartments.

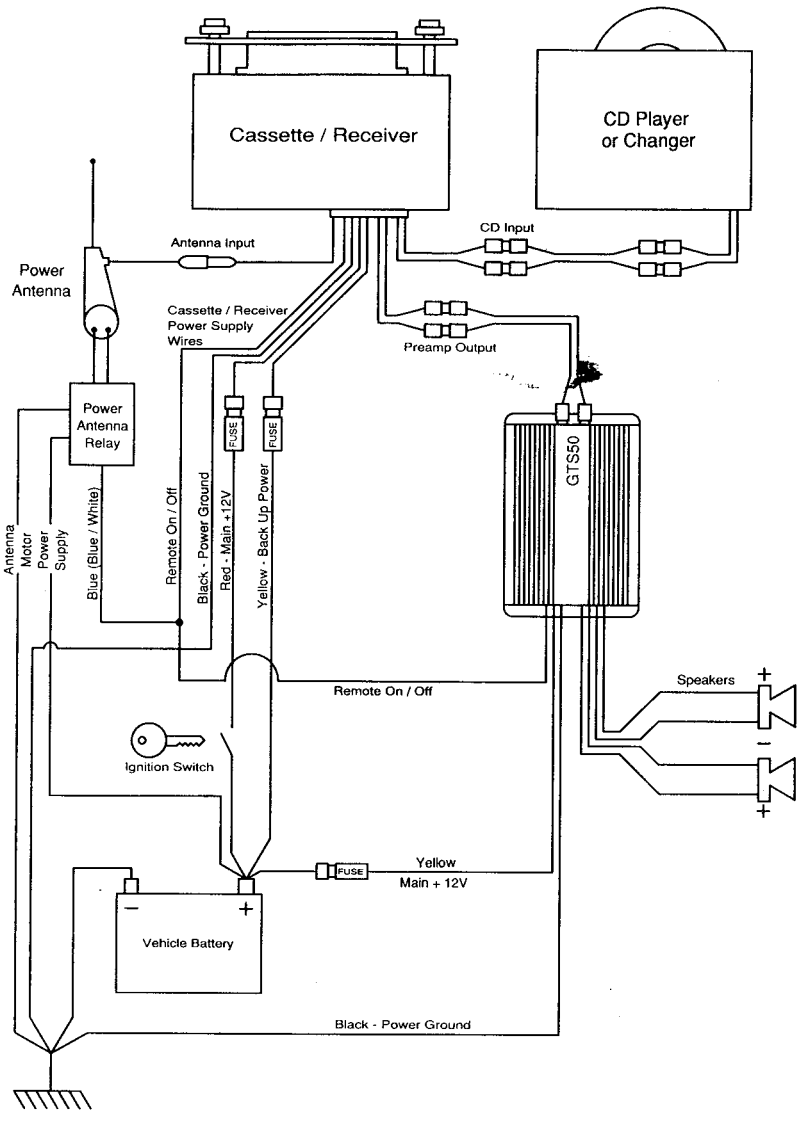
Be sure all wiring is secure and run where it will not be damaged. If wires are run through metal panels or are placed where they might be pulled, they should be protected with grommets and strain reliefs.

Do not run audio signal wires next to the power supply wires for the audio system or the wiring harnesses of the vehicle. Keep audio signal wires away from components such as ignition control modules and fan motors. This reduces teh chance that noise from the electrical system of the vehicle will be picked up by the audio signal wires.

To ensure long-term reliability, all wire-to-wire connections should be soldered and insulated with electrical tape or heat-shrink tubing. Terminate wires with crimp and solder-on lug terminals wherever appropriate, such as the power supply ground connection to the chassis of the vehicle.

It may be necessary to remove trim panels and sections of carpeting to hide the wiring. Work carefully and the effort will be rewarded with a reliable, attractive installation.

Wiring Diagram



Power Supply Connections

IMPORTANT: THE SET-SCREWS ON THE TERMINAL BLOCKS MUST BE TIGHTENED ONLY WITH A #0, FLAT-BLADE SCREW DRIVER SUCH AS XCELITE R184. DO NOT OVERTIGHTEN THESE SCREWS.

BAT(+) (Yellow) — The GTS150 will draw as much as 40 amps from the vehicle's electrical system. The standard power wiring in the vehicle would be overloaded by such current demands. So the +12 volt power supply wire must be connected directly to the positive (+) terminal of the vehicle's battery. A heavy gauge heat and oil resistant extension wire with an in-line fuse holder is supplied for this connection.

To prevent electrical system damage or fire, the fuse holder(s) and supplied fuse must be installed in the power supply wire, as close to the battery as possible.

Ground (Black) — proper grounding is extremely important. It has a significant effect on the overall performance and noise level of the system. The ground wire must be soslidly connected to a major sheet metal structure of the vehicle. Usually the power supply ground wire can be connected to a sheet metal panel near the amp mounting location. Scrape all paint and primer off the sheet metal at the grounding point to ensure a good electrical connection. Attach the wire to the grounding point with a sheet metaal screw and lock washer or a bolt/lock washer/nut set.

In some vehicles, such as those that have non-metal bodies, it may be necessary to extend the power supply ground wire and connect it directly to the negative (-) terminal of the battery. Use heat and oil resistant 10 gauge stranded copper automotive wire and solder and insulate the wire-to-wire connections. Keep the extension wire as short as possible. Solder a terminal on the end of the extension wire and connect it to the battery terminal.

In some installations the noise level will be lower if the GTS150 is grounded to the same point as the radio/tape deck.

Remote turn on — The remote power control system turns the GTS150 off when not in use to prevent discharging of the vehicle's battery. When a +12 volt "turn on signal" is applied to the remote turn on wire the amplifier is turned on. A red LED on the end panel of the amplifier lights when the amplifier is on. If the head unit has a +12 volt automatic antenna activation wire, the remote turn on wire may be connected to it. Some head units have no automatic antenna activation wire. Other decks have automatic antenna wires that are "on" only when the radio is used, the +12 volt turn-on signal is cut off when a tape is played. In such cases, the remote turn on wire may be connected to the standard radio or accessory wiring. An unused accessory terminal in the fuse block, or any other +12 volt source that is turned on and off with the vehicle's ignition switch, may be used. The remote on/off system draws only a small amount of current so a relatively small (18 or 20 gauage) extension wire may be used to connect the remote on/off voltage source. Be sure to older and insulate the wire-to-wire connections.

Input Connection

Proper wiring between the signal source and the GTS150 will help keep noise levels in the system low. Use high-quality shielded wire. Keep the wire as short as possible. Do not splice together shielded wires. The inputs of the GTS150 accept standard phono plugs (also called "RCA plugs"). The preamp level outputs of most head units have phono plug connectors. Some units have multi-pin DIN connectors and will require the use of adaptors. Proper wire and connectors can be obtained from any electronics parts supplier.

To prevent noise pick-up from the power supply wiring, do not route the preamp leel signal wiring near the power wiring for the amplifier or the vehicles accessories and lights. See the "Wiring" section of this manual for more detailed information.

The GTS150 can be interfaced with head units that only feature speaker outputs (no pre-amp outputs) by using a JBL GTL1 speaker-to-line level adaptor.

NOTE: The STEREO/L ONLY switch is designed to eliminate the need for a Y-adaptor. When this switch is set to L ONLY, it routes the same signal to both right and left channels by shorting the inputs together internally. Therefore, in this mode, only one of the inputs should be used. We have arbitrarily designated Left as the usable input. This L ONLY mode can be used when the amplifier is bridged, or when it is necessary to have both channels of the amplifier produce the same mono signal.

CAUTION: If both right and left outputs of a head unit are connected to the right and left inputs of the amplifier, the switch should be set to STEREO. If the Input Mode is switched to L ONLY, the head unit output to this amp, and all other amps connected to the same head unit, will become mono.

Speaker Connections

IMPORTANT: THE SET SCREWS ON THE TERMINAL BLOCKS MUST BE TIGHTENED ONLY WITH A #0, FLAT-BLADE SCREW DRIVER SUCH AS XCELITE R184. DO NOT OVERTIGHTEN THESE SCREW.

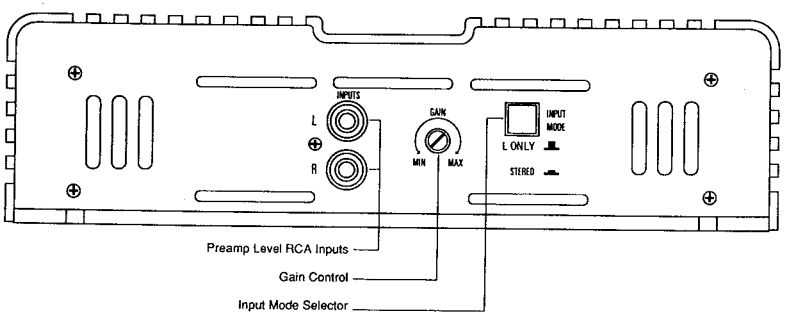
When connecting speaker wires, be sure that no uninsulated wire remains exposed and no loose strands of wire touch an adjoining wire or terminal or metal surface.

How the speakers are connected to the GTS150 depends on whether it is used in the bridged or unbridged mode. The amplifier has four set screw connectors for the speaker wires. The connectors are marked "L" and "R" for the right and left speakers respectively. When the GTS150 is used in the non-bridged mode the speakers are simply connected with a positive and negative wire connected to each speaker.

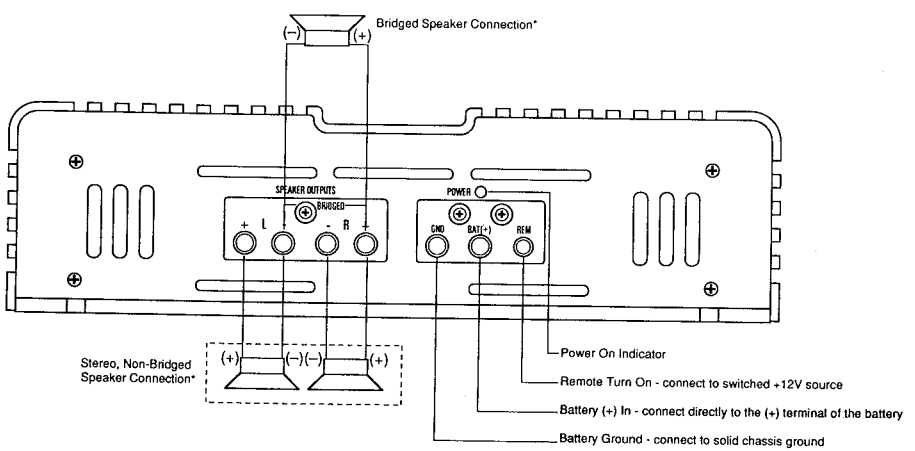
When the GTS150 is used in the bridged mode only two of the set screw connectors are used. They connectors are labeled BRIDGED with a set of bracket lines. The positive (+) connector of the RIGHT channel is connected to the positive terminal of the speaker and the negative (-) terminal of the LEFT channel is connected to the negative terminal of the speaker.

To get proper bass response and stereo imaging, all the speakers in the system must be "in phase". The input terminals of the speakers will be marked in some way to identify one as positive (+) and the other as negative (-). Make sure the positive (+) speaker terminal is attached to the positive (+) amplifier connection in every speaker-to-amp connection. All two-conductor speaker wire has one conductor marked in some way so it can be traced. Use high-quality speaker wire for the amplifier to sepaker connections. Wire that is 16 gauge or larger should be used. Larger wire or special high performance speaker cables may improve the performance of some systems. Be very careful when speaker wire is rounted through a door hinge area to door-mounted speakers. Use grommets and strain reliefs wherever necessary to prevent damage to the wires.

Input End Panel



Power / Output End Panel

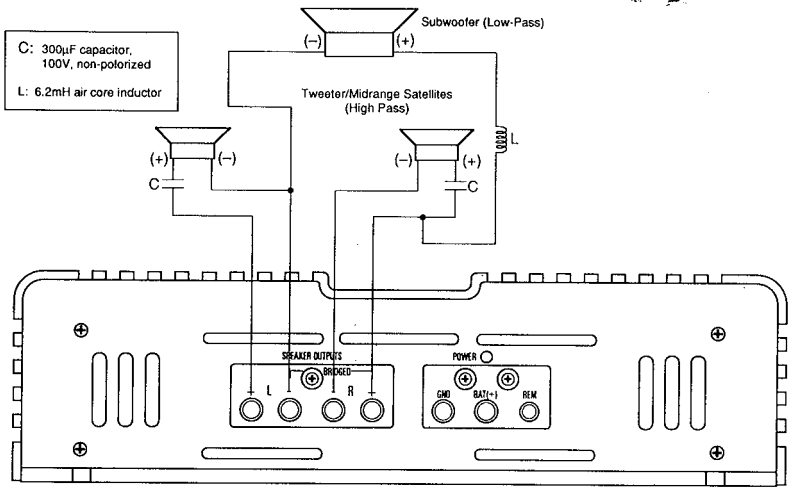


* Do not use both configurations (stereo and bridged) at the same time. For Simultaneous Stereo/Bridged Connection see other diagrams.

Simultaneous Stereo / Bridge Connection

The GTS150 possesses the ability to power a pair of stereo tweeter / midrange satellites, and one bridged subwoofer simultaneously off of one power amplifier, effectively creating a 3-channel system. This feature allows the user to start up with a high quality subwoofer system and later upgrade to a mutli-amp set-up. It is very important that non-polarized capacitros (one per tweeter / midrage satellite) and air-core inductors (16-gauge or larger, one per woofer) are used in this set-up. Power Supply (battery, ground, remote turn-on) and Input (stereo signal) Connections should be made as before. Speaker Output Connections should be made according to the diagram below:

Simultaneous Stereo/Bridged Connection



NOTE: The Input Mode Selector Switch must be in STEREO. All drivers are 4 ohms.

Operation

Before operating the GTS150, recheck all wiring connections to make sure they are correct and secure. Be sure the proper fuse (20 amps) is installed in the +12 volt power supply wire.

Gain Adjustment - The proper setting of the input sensitivity control on the GTS150 is important to the performance, noise level, and durability of the system. As a general rule, this control should be set as low as possible while still allowing adequate volume from the system. The signal coming from the head unit should be as high as possible to minimize the noise levels in the system.

To adjust the level controls in the system, start with the amplifier gain control set fully counter-clockwise. Set the volume control of the radio/tape deck to a point between 1/2 and 2/3 of full volume. Some radio/tape decks have auxiliary output level controls and generally they should be set to their maximum position. If adequate sound levels cannot be obtained without turning the volume knob of the radio/tape deck beyond the 3/4 point, turn up (clockwise) the gain control of the GTS150. If associated equipment such as equalizers or crossovers are used their output level controls should already be fully turned up. Always try to keep the gain on the GTS150 set fairly low. Stop turning up the controls when adequate volume levels are obtained or when the first signs of distortion are heard.

The gain control on the GTS150 can also be used to balance the sound of multi-amplifier, multi-speaker systems. This adjustment is complex and often requires lengthy trial and error settings. We recommend that you consult a professional autosound installer to help with such adjustments.

Turn on Delay — When installed as described in this manual, the GTS150 will turn on and off with the radio / tape deck or the vehicle's ignition switch. When the amplifier is turned on, there is a time delay of several seconds (longer in cold weather) before the speakers are connected. This gives the GTS150 time to stabilize before the speakers are connected. This prevents annoying and possibly damaging turn on noise.

Power Consumption — Operating the GTS150 when the vehicle is not running will discharge the battery. Under normal operating conditions, the GTS150 will draw several amps from the battery. After a few hours, this may discharge the battery to the point that it will not start the vehicle. Power consumption under "no signal" conditions is 1 amp. Even this small power usage can discharge a battery after several hours. To prevent such battery discharge, the blue Remote On/Off wire must be connected as described in the "Power Supply Connections" section of this manual.

Protection Systems — The GTS150 features protection circuitry to ensure reliable operation and prevent damage from extreme conditions. If the amplifier begins to cycle on and off it indicates a problem in the installation.

Check speaker wiring for short circuits or load impedance below 2 ohms, or if the GTS150 is bridged, below 4 ohms. Check the power supply wiring and the vehicle's power supply system voltage.

If the GTS150 is operated at high power levels in a high ambient temperature situation, the heat sinks may not be able to radiate all the heat generated by the normal operation of the amp. If the temperature of the GTS150 reaches a level that could cause damage, the thermal overload protection circuit will turn the amplifier off. It will trun itself back on again when it cools off. Repeated activation of the protection circuit indicates that the system is being improperly operated, that the amplifier should be relocated to an area that has a lower ambient temperataure or to a location that allows more air circulation around the heat sinks.

Fuse Replacement - If the fuse in the yellow +12 volt power supply wire must be replaced, do NOT replace it with a fuse rated for higher current levels. The maximum allowable fuse size is 20 amps. Do not bypass or modify the fuse or fuse holder. Replacing the standard fuse with one rated for higher current levels or bypassing the fuse will void the warranty and may cause serious damage. NOTE: The GTS150 will draw as much as 40 amps from the battery, but only for very brief instants. The 20 amp fuse will pass such current surges without burning out. Do not use a fuse larger than 20 amps. Do not bypass or modify the fuse or fuse holder.

Noise Suppression

The electrical system of every vehicle has some electrical "noise" that is generated by the ignition system, the alternator, the accessories, and their wiring. High performance audio equipment is more likely to pick up such noise than conventional equipment because it has wider frequency bandwidth and high gain (amplification) circuits. The GTS150 has a built-in power supply filter to prevent such noise pick-up If noise is being picked up, it is probably the result of improper installation. Often the noise is being picked up by the radio/tape deck and only being amplified by the GTS150. The following suggestions will help eliminate most noise problems.

Grounding - Most noise problems are caused by inadequate grounding. All the components in the system must be grounded to a major metal member of the vehicle's frame. In modern vehicles, the structural supports behind the dashboard may be plastic or they may be insulated from the main chassis structure. Be sure all the electrical ground connections are solidly grounded.

In some cases it may be necessary to ground the GTS150 and the radio/tape deck at the same point. Or it may be necessary to use a different grounding point.

Add-On and Upgrade

The JBL GT Series of power amplifiers and electronic crossovers allow the user to start up with one power amplifier, and build up a large, competition-quality system, without having to throw away any of the previously purchased components: