

GTP4
IMAGING ENHANCER
OWNER'S MANUAL



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Introduction

Congratulations on the purchase of the GTP4 Imaging Enhancer. The GTP4 will take your car audio system to a higher level of performance by creating excellent imaging and ambient soundfield recovery.

The JBL GTP4 is designed to take any normal stereo signal and recreate a realistic sound stage and center image without the need for adding a tough to install center channel speaker. This phantom center image is created through a JBL proprietary technology (patent pending) which takes advantage of recent psychoacoustic discoveries to reproduce realistic staging with a solid center image. The GTP4 also includes the capability to extract ambient information from the recordings. This ambience recovery helps recreate the “live” feeling of listening to music in any environment from a small club to a large auditorium.

The proprietary circuitry features the ability to optimize the sound stage for the driver by creating an extremely well defined phantom center channel in the middle of the dashboard (“DRIVER” switch position). The imaging can also be optimized for all occupants by choosing the “ALL” switch position. The sound stage can be widened by adjusting the “Front Ambience” knob.

The rear channels increase the depth of the sound stage by producing pure ambience signals. The ambience created by the rear channels recreate the phenomena of the original soundwaves bouncing off the back walls of a listening environment. The depth of the sound stage can be adjusted on the wired remote control.

The rear channels are true rear surround outputs that are capable of extracting rear channels information from Dolby Surround™ encoded recordings as well as normal stereo recordings. Unlike many other surround processors, the front and rear channels of the GTP4 retain their low frequency information (bass) in both minimum and maximum ambience modes.

Please read all the information in this manual before attempting to install the GTP4. The GTP4 is a sophisticated electronic device that requires proper installation and operation in order to realize its full performance potential.

Specifications

Frequency Response	20 - 20k Hz (± 0.1 dB)
THD	0.025%
Signal-to-Noise Ratio	100 dBA
Maximum Line Level Input Voltage	4V rms
Input Impedance	20k ohms
Output Impedance	250 ohms
Maximum Speaker Level Input	7V rms
Speaker Level Input Impedance	15 Ω
Power Requirement	11 to 16 VDC negative ground
Fuse Size	3 AMP "ATC" Type Automotive Fuse
Size: Main unit (inches. L x W x H)	5-7/8" x 7" x 1-1/2" (149mm x 178mm x 38mm)
Size: Remote Control Box (inches. L x W x H)	2.56" x 3.3" x 1.18" (65mm x 84mm x 30mm)

Features:

Wired Remote control:

Front Ambience level control — Controls the width of the sound stage.

Driver / All image optimizing switch — In the "Driver" position, a center image is created for the driver in the middle of the dashboard. All vocals will seem to come from the center of the dashboard, without the use of a center mounted speaker, while true left or right signals will come from the sides. The "All" position allows driver and passengers to hear good imaging from either position.

Rear Ambience level control — Adjusts the depth of the sound stage.

On/Bypass switch — "On" position activates the GTP4 Imaging Enhancer. "Bypass" position returns front and rear outputs to normal stereo output.

Large, or Standard car internal optimization switch — Allows user to optimize the Driver position center imaging for different sized cars.

Gold Plated Power Terminals

Front Outputs — Produces excellent center channel imaging without the need for a center speaker. Variable ambience recovery for adjustable listening image width.

Rear surround outputs — Produces rear ambience. Extracts rear surround information from Dolby Surround™ encoded and normal stereo sources such as CDs, cassettes, and FM broadcasts. Retains low frequencies in "Bypass" and "On" modes.

Pulse Width Modulation (PWM) DC-to-DC Switching Mode Power Supply — Provides excellent transient response, headroom, and immunity to installation-related noises (such as alternator whine).

Low Noise Input Section — All JBL electronic signal processors are designed not only to reject induced noises such as alternator whine or spark noise, but to provide audiophile-quality signal-to-noise ratio as well.

Gold-plated RCA Input

Connectors — For most accurate signal transmission and lowest possible loss. Gold-plated terminals are immune to signal deterioration over time that can be caused by corrosion in the connectors.

Second-order, 12 dB per octave, Capacitive/inductive Power Supply Input Filtering — This specially designed battery voltage input section provides excellent immunity to system noises such as alternator whine.

Full Protection Circuitry — The JBL GTP4 is equipped with special protection circuitry to minimize the possibility of damage from mishandling or accidents. However, none of these protection systems are in the signal path to interfere with the sonic performance of the GTP4.

About Installation

The GTP4 is a sophisticated device that must be properly installed and adjusted in order to provide proper performance. This requires knowledge of car audio equipment and automotive DC power systems and some basic mechanical skills. If you do not have the necessary knowledge and skills, we strongly recommend you have the GTP4 installed by an authorized JBL installation specialist. If you plan to do your own installation, prepare well before you start.

- 1) Read all installation and connection instructions carefully. Pay particular attention to the caution notes and installation tips.
- 2) Carefully select the equipment to be used with the GTP4 and be sure that all input and output voltage requirements are met.
- 3) Have the installation completely planned before you start. The routing of wires, the power supply connection points and the equipment installation locations should be carefully planned before beginning.
- 4) Work carefully and check each step as it is performed. Before operating the system, recheck the installation to be sure each connection is correct (check polarity of the speakers and proper connection of the left and right signals), properly insulated and secure.

Installation Precautions and Tips

Before beginning the installation of the GTP4 read all of the following information carefully. Failure to heed these warnings could result in **PERSONAL INJURY OR DAMAGE TO PROPERTY.**

CAUTION: The GTP4 should be installed only in vehicles that have a 12 volt negative ground electrical system. Connecting it to other types of systems could damage the unit and / or the electrical system of the vehicle.

CAUTION: Before drilling the pilot holes for the GTP4 mounting screws be sure that doing so will not damage critical parts of the vehicle, such as electrical wires, fuel lines or hydraulic brake lines. Damage to any of these parts can cause immediate or delayed **HAZARDS TO LIFE AND PROPERTY.** Double walled panels can obscure the location of such critical components. Be **EXTREMELY** careful when planning and implementing the installation.

CAUTION: Wear eye protection whenever cutting, drilling or filing any parts of the vehicle.

To ensure reliability, all power wiring connections must be strong and well insulated. Connections should be made by soldering the wires and insulating the connection with electrical tape or heat-shrink tubing or with insulated crimp-on connectors.

Never bypass or modify the fuse holder in the main unit. Never replace the power supply fuse with a higher capacity fuse. Doing so could result in damage to the unit or the vehicle's electrical system.

Beginning The Installation

Remove any parts of the vehicle that may limit access to the installation location. Position the GTP4 in the installation location to be sure there are no obstruction that will interfere with the installation or limit access to the controls. Decide where the power supply connections and remote control connection will be made and how these wires will be run to the connection points. Consider where the amplifiers will be mounted and how the audio signal wires will be run from the signal source to the GTP4, and from the GTP4 to the amplifiers. The length of the audio signal wires should be kept as short as possible to keep noise levels in the system as low as possible.

Physical Installation

Main Chassis Installation

Review the "Caution" note about drilling holes. Set the GTP4 in the installation location and mark the mounting screw hole locations. Set the GTP4 aside and drill pilot holes for the mounting screws with a 1/16" bit. Note: If the panel on which the GTP4 is being mounted is covered with carpeting or upholstery, cut a small "x" in the material at each screw hole location before drilling the holes. This will help prevent tearing or stretching of the material and will reduce the chance that carpet fibers will be pulled out and entangle the drill. Set the GTP4 back in the installation location. Put a lock washer and flat washer on the supplied self-tapping sheet metal screws. Drive the screws into the pilot holes until they are firmly set, but be careful not to over tighten them.

Note: Do not use the GTP4 chassis as a template when drilling as this can cause damage to yourself and the unit.

NOTE: Repeated fuse burn out indicates improper installation.

The GTP4 must not be installed where it will be exposed to moisture, excessive heat, dust, dirt or vibration. It should be installed only in the passenger or trunk compartments.

Do not mount the GTP4 where something could lay up against it. Choose a mounting location for the GTP4 that allows easy access to the wiring connections and output level controls.

If the power supply wires must be run outside the passenger or trunk compartments be sure to use heat and chemical resistant automotive wire. Be sure all wiring is secure and run where it will not be damaged. If wires are routed through metal panels or are placed where they might be pulled they should be protected with grommets and/or strain relief.

Audio signal wires should never be run outside the passenger/trunk compartments. They are not made to withstand exposure to heat and chemicals.

Do not run audio signal wires where they will lay along side the power supply wires for the audio system or the wire harnesses of the vehicle or near components such as ignition control modules, fuel pumps, or fan motors. This reduces the chance that noise from the electrical system of the vehicle will be picked up by the audio signal wires.

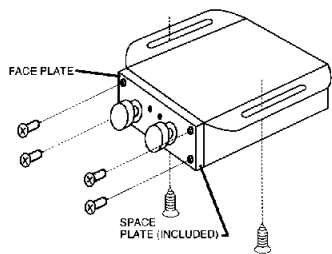
It may be necessary to remove trim panels and sections of carpeting to completely hide the wires. Work carefully and the effort will be rewarded with a reliable, noise-free, and attractive installation.

Remote Chassis Installation

The wired remote of the GTP4 can be installed either in dash or under dash.

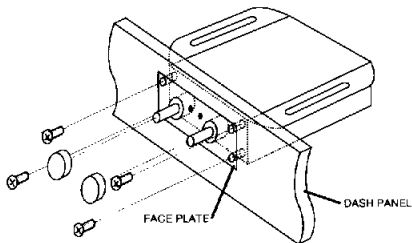
Under dash remote installation

- 1) Set the GTP4 remote in the installation location and mark two mounting screw hole locations.
- 2) Set the GTP4 remote aside and drill two pilot holes using a 1/16" bit. Be careful not to drill into any of the cars components.
- 3) Secure the spacer and faceplate (with the control labeling to the front of the remote control panel) using the four smaller screws included.
- 4) Push the two adjustment knobs onto the metal shafts.
- 5) Set the GTP4 remote back in place and secure it using two sheet metal screws. Continue to step 6 in the "In Dash Installation" section.

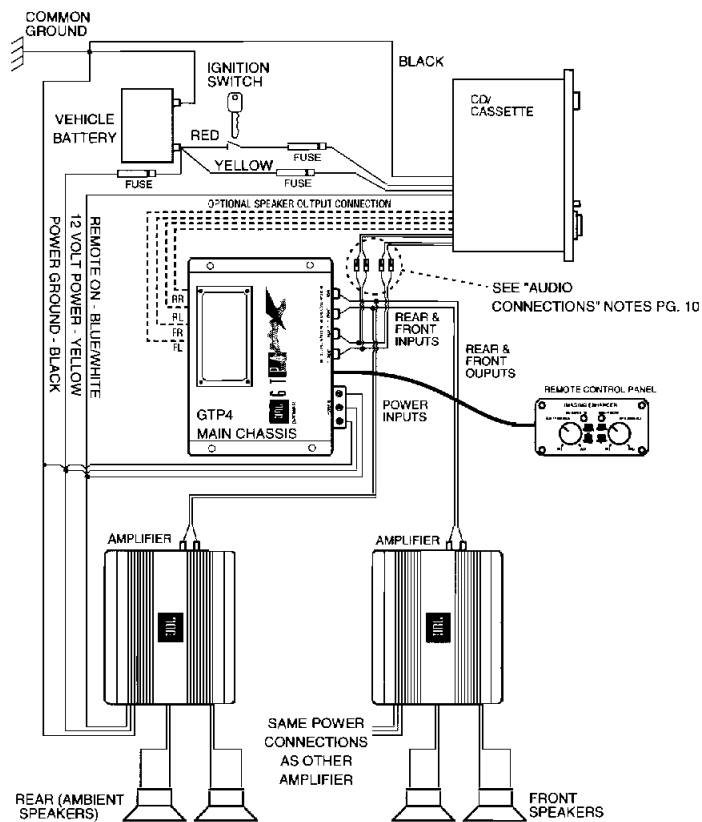


In dash remote installation

- 1) Choose a location for the in dash installation and use the template on the back of this manual to mark hole locations as shown on the template.
- 2) Drill the holes indicated on the mounting template.
- 3) Using the diagram below as reference install the remote behind the panel with the holes just drilled. Position the remote so the two knobs feed through panel and the LED's are in alignment with the holes drilled.
- 4) Place the trim panel with the control labeling over the two shafts and secure it into place with the 4 screws provided.
- 5) Push the two adjustment knobs onto the metal shafts.
- 6) Connect one end of the GTP4 remote control wire (included) to the connector on the back of the remote control box.
- 7) Run the wire back to the GTP4 main chassis and plug the remote control wire into the "Remote In" connector on the main chassis. Note: a standard 6-pin telephone extension cord may be used if more wire is needed for remote control connection. These extension cords can be purchased at many electronics or hardware stores.



System Connection Diagram



Power supply Connections

The power supply wires for the GTP4 are to be connected to the power supply terminal that extends from the front of the chassis.

Keep the power wires as short as possible. If they must be run outside the passenger and trunk compartments, use heat and

chemical resistant automotive wire. Be sure the wire connections are strong and well insulated.

Battery (+)12 volt power input —
Connect a wire from this terminal directly to the battery's positive (+) terminal. Be sure to use an additional in-line fuse

holder (not included), with a 3A fast blow fuse, as close as possible to the battery's positive (+) terminal. Use 12-gauge wire for the power wire.

Battery ground — Proper grounding is extremely important. It has a significant effect on the overall performance and noise level of the system. This wire should be connected to a solid electrical ground point on the frame of the vehicle or somewhere in the electrical system. If the ground wire is connected to a part of the vehicle frame that is painted, scrape off the paint and primer to ensure a good ground connection. For best results, connect this wire to the back of the chassis of the FM/AM/Tape or CD head unit on a metal case ground.

Remote Turn-on — Connect this wire to a +12 volt source that is turned on and off with the system. Most head units have a "remote on" or "power antenna" wire that can be used for this connection. Alternatively, the Remote on wire can be connected to a +12 volt source that is turned on and off with the accessory system of the vehicle.

IMPORTANT NOTE FOR RIGHT HAND DRIVE CARS:

For countries which have right hand drive cars all input and output connections to the GTP4 should be reversed. Connect the left output of your CD/Cassette to the right input of GTP4 and the right output of the CD/Cassette to the left input of the GTP4. Connect the right output of the GTP4 to the left input of the amplifier. Connect the left output of the GTP4 to the right input of the amplifier.

Audio Connections

The signal voltage levels and impedances of the inputs of the GTP4 are compatible with virtually all signal sources that feature preamp. (line) and speaker level outputs.

Preamp Level Connections —

Connect the audio input and output RCA connectors as shown in the diagram. The connections to and from the GTP4 should be made with high quality shielded cables terminated with standard RCA connectors. These cables should be kept as short as possible to minimize the chance of noise being picked up. Never attempt to splice together shielded wires.

Speaker Level Inputs — When the high level (speaker level) outputs of a cassette/CD are used to drive the GTP4, the signal goes into the GTP4 through a special 8 wire harness and connector (included). If extension wires must be used to connect the speaker output from the cassette/CD player to the GTP4 high (speaker) level inputs use 18 gauge speaker wire. Keep such extension wires as short as is practical and do not run them outside the passenger and trunk compartments. Use the color code of the input wire harness and the cassette/CD player output wires to be sure the left/right channel orientation and the positive/negative orientation, of each connection is correct. For example, the left positive output of the cassette/CD player must be connected to the left positive input of the GTP4. The color code for the high level input wire harness is:

Left Front +	White
Left Front -	White/Black
Right Front +	Grey
Right Front -	Grey/Black
Left Rear +	Green
Left Rear -	Green/Black
Right Rear +	Purple
Right Rear -	Purple/Black

Refer to "System Connections Diagram and System Configurations Diagram" for more information.

After finishing the audio connections double check that all connections are Left in to Left out and Right In to Right Out (Right hand drive cars must cross these wires - see note on page 9). Also double check that all speaker wiring is connected observing proper polarity markings. Correct phase and L/R wiring is crucial for proper operation of the Imaging Enhancer.

GTP4 Controls and Connectors

1. REMOTE CONTROL CONNECTOR

Connector for wired remote control.

2. CAR SIZE OPTIMIZER SWITCH

This switch is located under the plastic access panel. The switch optimizes and centers the imaging for either large or standard size cars. The switch should normally be set to standard but can be adjusted by listening and selecting the switch option which positions vocal imaging at the center of the dash.

3. POWER LED INDICATOR

This indicator lights when the unit is powered up and operational.

4. POWER CONNECTOR

Connect the Battery +, Ground and CD/Cassette Remote on/off line to this connector.

5. FUSE

3 amp ATC type fuse.

6. LINE LEVEL INPUT RCA CONNECTORS

7. OUTPUT RCA CONNECTORS

8. SPEAKER INPUT CONNECTOR

Input which can accept speaker level connections from CD/cassette players which do not have line level outputs. Do not use speaker level inputs and line level inputs at the same time.

9. REMOTE BYPASS/ON INDICATOR

This indicator is on when the GTP4 processors is engaged and off when the GTP4 is bypassed.

10. DRIVER/ALL OPTIMIZER INDICATOR

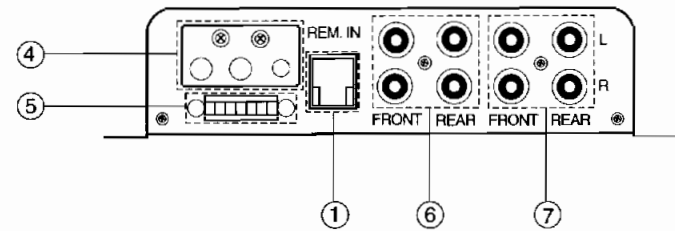
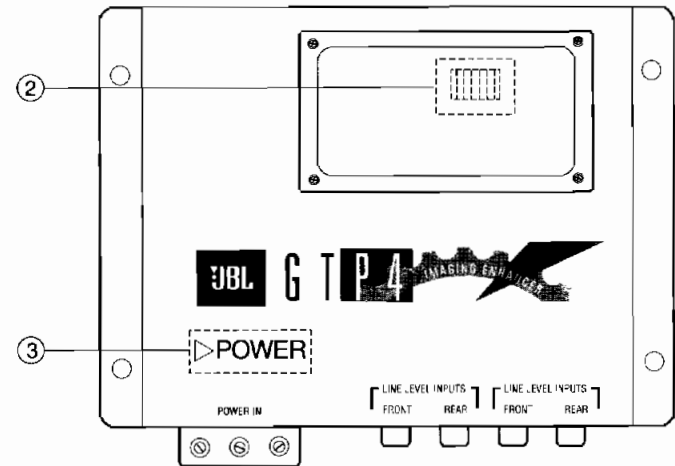
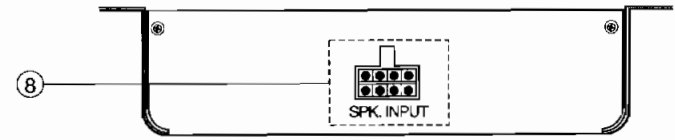
This indicator is on when the GTP4 is in "Driver" optimization mode and off when the GTP4 is in the "All" passenger mode.

11. FRONT AMBIENCE AND ON/BYPASS CONTROL AND SWITCH

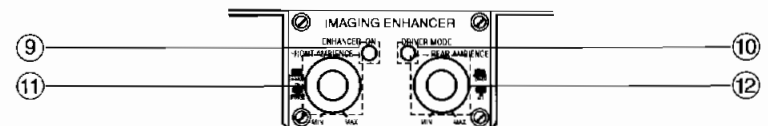
Rotating this control adjusts the amount of ambience and front staging width produced by the GTP4. Pulling the knob places the GTP4 in "BYPASS" mode. Pushing in the knob places the GTP4 in "ON" mode.

12. REAR AMBIENCE AND DRIVER/ALL OPTIMIZER CONTROL

Rotating this knob controls the amount of rear fill ambience and the "room size" of the acoustic environment when used in a system with rear speakers. Pulling the knob out places the GTP4 in "ALL" optimization mode. Pushing the knob in places the unit in "DRIVER" passengers optimization mode. Best results at the drivers position will be achieved with the control in the "Driver" setting.



REMOTE



Operation & Setup

After the installation is finished and all wiring is checked, proceed with the next few steps.

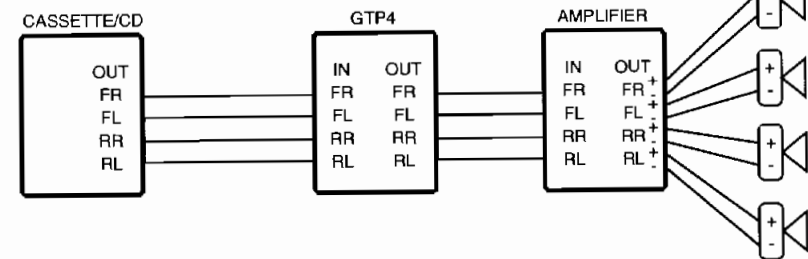
Note: Since the GTP4 is primarily designed to optimize the sound stage for the driver, all tests should be performed while sitting in the driver's seat.

1. The Power Indicator LED on the GTP4 main chassis should light up when the head unit is turned on.
2. Make sure the "Front-ambience/Bypass/On" knob and "Rear-ambience / Driver/All" knobs are pushed in and rotated completely counter-clockwise
3. Play a selection which has vocals and good 'center' channel information.
4. Gently turn up the volume to a comfortable listening level. You should hear a very distinctive center image coming from the middle of your dashboard. If not, make sure the "Rear ambience /Driver / All" knob is pushed in to the "Driver" position for driver optimized sound stage.
5. Proceed to push and pull the rear ambience knob to hear the effects of "Driver" and "All" modes. You should hear imaging coming from the middle of the dashboard when the knob is pushed in (Driver mode). You should hear stereo with ambience recovery when the knob is pulled out (All mode). If you find that the center imaging in the "Driver" position is slightly offset to the left or right side of the dashboard, there is a two position image adjustment switch inside the main unit which allows optimization of the center imaging for large or standard size cars. This switch is accessible through the small top plate on the main chassis of the GTP4.
6. Slowly turn the "Front-Ambience knob in the clockwise direction to increase ambience. You should begin to hear slight echoes in the music and a sense of a widening front sound stage in both the "Driver" and "All" modes.
7. Slowly turn the "Rear-Ambience" knob in the clockwise direction to increase rear ambience (only in systems with rear speakers). You should begin to hear an increase in echoes and a feeling of being in a very large auditorium. Note: The GTP4 converts the rear channels into a true rear-fill surround channels which cancels all center information (vocals, horns, etc.) and lets only true stereo and ambience information come out. This same process is used in more expensive "Surround Sound" system used in theaters.
8. Adjust the front and rear ambience as desired. For optimum center imaging, it is recommended that ambience be used sparingly on the front channels.
9. To bypass the effects of the GTP4, simply pull on the "Front-Ambience" knob until it clicks to the "bypass" position. The "Enhancer On" LED on the remote control panel with turn off and your sound system should revert back to normal stereo sound without ambience.

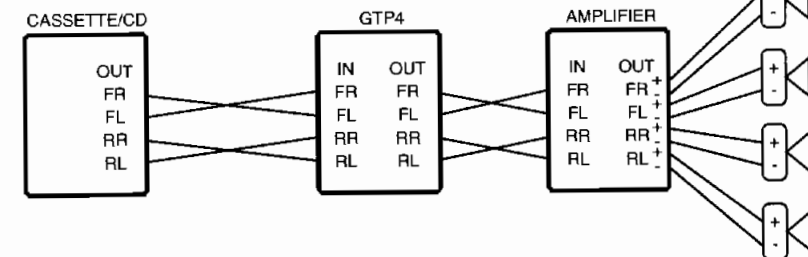
System Configurations

Typical GTP4 system configurations is are shown below.

LEFT HAND DRIVE CAR



RIGHT HAND DRIVE CAR



In Case of Difficulty

Main chassis power light does not come on.

- Head unit is not on; turn the head unit on.
- Ground wire is disconnected or defective; check for continuity with an ohmmeter between GTP4's ground terminal and a known chassis ground point.
- Battery wire is disconnected or defective; check for approximately + 12 volts between GTP4's Battery and Ground terminals.
- Blown Fuse; check GTP4's 3A Fuse, located on the main chassis near the Battery terminal. If it is blown, replace it with an identical one. If the new fuse blows immediately, then check all the wiring connections. If no fault is found, consult your JBL dealer.

Main chassis power light is on, but no sound is heard from front, rear or both front and rear channels.

- Remote-on wire between the head unit and the GTP4 is disconnected or defective; check for +12 volts between GTP4 Remote-on connector and ground connector with the head unit on.
- Defective or disconnected audio cables; check for continuity and replace if necessary.
- Bypass the GTP4 by connecting its input and output cables together (with a female-to-female RCA adapter). If the system becomes functional, the GTP4 may be defective, consult your JBL dealer.
- Defective Head Unit, or other audio component. Check each component for wiring and operation.
- Verify that the remote control is properly connected to the remote unit and the main chassis.

Alternator whine through the audio system with the engine running.

- Ground loops; connect grounds of all audio components to the same point on the vehicle chassis, verify that this point is a true ground by checking for continuity with an ohmmeter between the ground point and the battery's (-) terminal.
- The other audio components may need noise suppressors on their battery or ignition connections.
- Check the vehicle's battery and voltage regulator.
- Bypass GTP4 w/ female - female adapter if whine stops. Check that the unit is grounded to a true ground. Check to see if adding a noise suppressor to the battery or ignition connections reduces the whine. Try grounding the GTP4 at the same point as the CD/Cassette.

Main Chassis Power Light is on and sound is heard from the front and rear channels but the Imaging is not improved.

- Verify that the remote control is not set in "BYPASS" mode by checking to see that the "ON" LED is lit.
- Using the system configuration diagram, confirm that the audio connections are correct for signal path and polarity. Note that right hand drive car installations must have the Left and Right input and output connections as shown in the "System Configuration" diagram.
- Perform the adjustments as directed in the "Operation and Setup" section.

Remote In-dash Installation Template

