

LC6tm

Six Channel Line Output Converter

For interfacing with factory installed audio systems

Greetings from the rainforests of the Pacific Northwest. We would like to congratulate you on your purchase of the LC6; a six-channel, high-performance, line-output converter. This unique product will accept two, four, or six channels of speaker-level signal from a factory-installed amplifier or source unit and convert it to a high-quality, low-noise pre-amp signal. Therefore the LC6 will allow you to use your factory installed source unit but give you the ability to add a really good aftermarket amplifier and processor. Whether this is your first product from the rainforest dwellers of AudioControl or you are already a firm believer, you will definitely enjoy how great the LC6 can make your performance system sound.

Now before you start salivating just thinking about the benefits of your LC6, take a few minutes to sit back, have a cold beverage, and read through this manual. It contains lots of useful facts and information - - and besides, we spent a lot of time writing it!

Key Features of The LC6

Here are some of the cool features that your LC6 offers:

- Six input and output channels
- Speaker-level inputs
- AutoModetm inputs
- Signal sensing inputs
- Level matching controls
- 12 volt trigger output
- Input for optional subwoofer level control
- Positron nuclear technology (not really, but it made you look!)

AudioControl[®]

making good sound better[™]

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Features and Highlights

Speaker-Level Inputs

If you are like many people who like the look and features of their factory-installed source unit but feel it's lacking power and bass, we have good news. The LC6 has high-impedance speaker-level inputs that allow it to accept amplified signals from most factory-installed source units (even Bose) and output a high-quality pre-amp signal via standard RCA connectors. This will allow you to add better-quality amplifiers, processors and speakers while keeping the convenience features of your factory-installed source unit. Unlike "inexpensive" speaker-level and line-output converters available, the LC6 offers high sound quality and can handle the full signal strength of a 400-watt amplifier.

Signal-Sensing Inputs

Most engineers of factory-installed source units lack the common decency to include features that make it easy to upgrade with really good-sounding, performance after-market products. One of those key features is a 12-volt trigger that will turn on devices like the LC6 and your external amplifiers. Therefore, we have equipped your LC6 with signal sensing inputs, which means once it detects a speaker-level signal at its inputs, it will power up. When you turn off the your source unit and the speaker-level signal goes away your LC6 will automatically turn off after a few minutes. This turn-off delay is in case you are changing CD's or your radio station is quiet for a few moments and you then you don't really want your system to turn off. Optionally, your LC6 is also equipped with a standard 12-volt trigger (Remote In) that will allow you to turn on your LC6 in the traditional manner.

12-Volt Trigger Output

Since you will be using an external amplifier and processor in your system, you will need the ability to "trigger" or turn-on these devices (a romantic dinner won't quite work here). Your LC6 has a 12-volt output trigger (labeled "Remote Out") that will provide a 12-volt output to trigger these remote devices, when the LC6 is powered up. Please note that this output is not to be used as power for these devices.

AutoMode Inputs

Sometimes in life (and car audio) we need more outputs than inputs. Therefore we have equipped your LC6 with AutoMode inputs that take the rear-channel signal and automatically feed it to the subwoofers, when there is no signal present on the subwoofer inputs. This means your LC6 will accept two input channels and give you four output channels. Or it can accept four input channels and give you six output channels. (See Figure Six.)

Level Matching Controls

Your LC6 has level controls for each pair of channels. These controls allow you to adjust the signal level from your factory-installed amplifier or source unit to match up with your after-market amplifier or processor.

Input For Optional Subwoofer Level Control

With the addition of performance, after-market amplifier and speakers, you may feel the need to have more control over your system. The *Remote Subwoofer Level Control* (sold separately) allows you to add a dash-mounted control to your LC6 that will control the level of the Subwoofer Output. This output is full range so it may need to be crossed over.

Bulletproof Warranty

The most important feature of all. Every AudioControl product is selflessly designed and manufactured by the occupants of our rainforest factory. We take every effort to ensure that you will have many years of enjoyment out of your LC6. To ensure optimal performance we highly recommend that you allow your authorized AudioControl dealer to perform the installation. Not only do they have all the right knowledge and tools, but also in the unlikely chance your LC6 should stop working, we will back it with a limited five years parts and labor warranty. Should you choose to install it yourself we will still give you a one-year parts and labor warranty. To activate your warranty, you need to **FILL OUT AND SEND IN YOUR WARRANTY CARD!**



We also recommend that you save your invoice or sales slip as proof of installation and ownership. Not only is it necessary for warranty purposes, but should your LC6 “walk away” one day while your car is parked at your local latte’ stand, you will find insurance companies very unforgiving without proof of purchase.

Quick Installation Information

For those of you short on time but high on ambition, we offer the following section to speed up your installation of the LC6:

1. Physically mount the LC6 in a location that keeps it away from soda spills, food crumbs, and curious fingers. You will want to select a location that allows you access to the level controls. In many cases you can find factory speaker leads in the rear of the vehicle that are easy to access.

2. The LC6 needs to be installed in the signal path between your OEM source unit or factory-installed amplifier and an external amplifier and/or processor(s). Locate the speaker wires that are coming from your factory source unit and/or amplifier and connect them to the speaker-level inputs on your LC6.

3. Connect the Output RCA connectors to cables that run to your external signal processors and/or amplifiers. If this is not obvious to you, quickly pack up your LC6 and run to your nearest authorized AudioControl dealer to have them perform the installation. You will thank us later.

4. Connect +12 power, ground, and remote turn-on (if applicable).

5. Level match your LC6 to your source and amplifiers.

Note: You will want to turn the gains DOWN on your aftermarket amplifiers to maximize your systems performance and minimize any HISS!

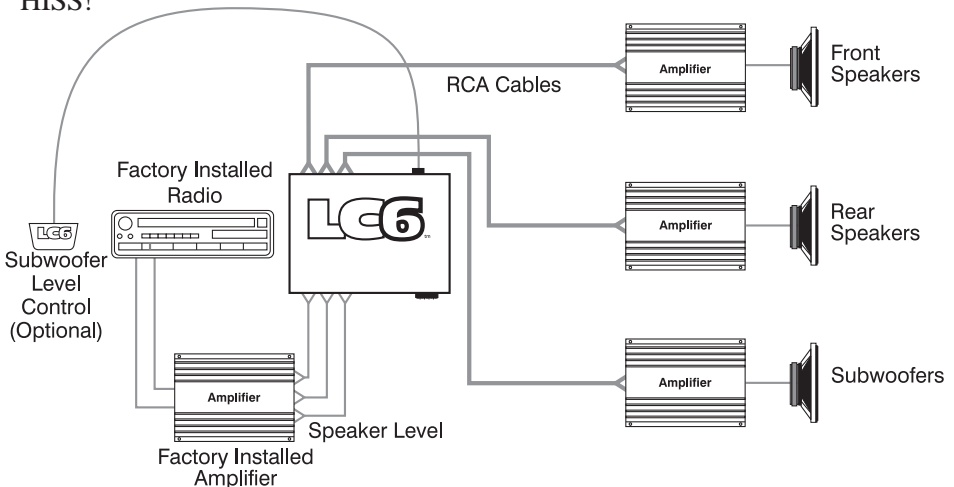


Figure 1: Basic LC6 System

If you need to know more, then read on. Heck, if you don't need to know more, still read on, because you can never know too much...plus we spent a lot of time writing this manual!

A Guided Tour of LC6

❶ Speaker-level Inputs: The LC6 has six speaker-level inputs. These inputs get their signals from the speaker-level outputs of the source unit or factory-installed amplifier if your vehicle is so equipped. If your source unit has front, rear, and subwoofer speaker-level outputs, connect them to identical inputs on your LC6. If the source unit only has front and rear inputs, the Auto Mode circuitry in your LC6 automatically routes the rear input channels to the subwoofer channels.

❷ Ground – Connect to a good, verified chassis ground (the battery comes to mind.) *Warning: Factory ground wires typically already have multiple devices connected to them and are not recommended.*

❸ +12 – Connect to a good source of power (the battery comes to mind again)

❹ Remote In – Allows your LC6 to be turned on remotely with a 12 volt signal

❺ Remote Out – Outputs 12 volts when the LC6 is powered up so you can turn on external devices like signal processors and external amplifiers.

❻ Maximized Indicator - This brightly colored LED indicates when your signal level is just below clipping your LC6. When properly level matched, this LED should only flicker occasionally when your system is playing at its maximum volume level.

❼ Power – If you have connected all of your power wires correctly, this light should be bright red when your system turns on.

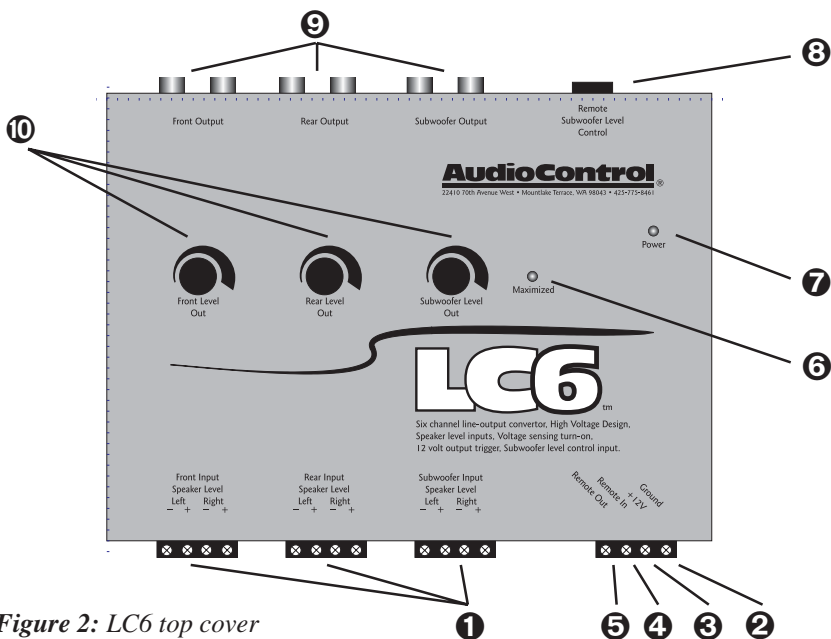


Figure 2: LC6 top cover

⑧ Remote Subwoofer Level Control Input– This input allows you to add an optional (sold-separately-not-included) remote that will allow you to control the subwoofer output of your LC6 from your dashboard.

⑨ Pre-Amp Outputs: These RCA connectors should be connected to the next component after the LC6, such as a signal processor, crossover or amplifier. Do not connect any speakers directly to your LC6 or to any home appliances, like your microwave.

⑩ Level Controls: These knobs allow you to adjust the signal level from your source unit to match that of your after-market amplifiers. Because they are amplified, most factory-installed source units have relatively high signal voltage output, which will require you to decrease the signal level.

UNDER THE COVERS

1. Signal Sense Settings: This allows you to select how much speaker-level signal is necessary to turn on your LC6. The shipped-from-the-factory setting of “NORMAL” is fine for most systems. However should your system put out an abnormally low signal level, you may wish to change the jumper to the lower setting.

2. Ground Isolation Selector: Occasionally alternator noise may appear in a system because the source unit and amplifier are using different grounding schemes. To help in this situation, we have provided alternative grounding connections. Make sure your system is turned OFF before you move these jumpers.

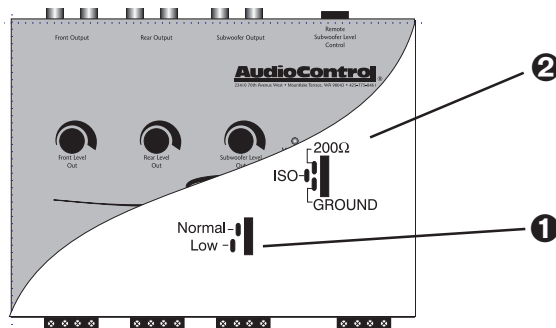


Figure 3: Inside view of LC6

Factory Settings

	Shipped	Options
Ground Isolation	Isolated	200ohm or Ground
Autosensing Voltage	Normal	Low
Weather	Rainy	Overcast

INSTALLING YOUR LC6

By this time we are sure that you are chomping at the bit to install your LC6. Up to this point, everything you have read has served to educate you on the operations of LC6. Therefore if you are still with us we recommend you read the following sections very carefully.

Placement & Mounting of the LC6

Your LC6 can be physically installed in numerous locations like behind your dashboard, under a seat, or even in the trunk. Since you will be connecting to the speaker wires from the factory source unit or its amplifiers, you should select a location that is convenient for wiring. Once you have selected a permanent mounting location, position the unit and mark the appropriate mounting holes with a felt-tip pin or scratch awl. Before doing anything else, make sure you are not about to drill a hole in a gas tank or pierce any existing wiring. Nothing ruins your day more than an expensive repair bill. Drill a few small pilot holes and secure the chassis of the LC6 with self-tapping screws.

LC6 Power Wiring

WARNING: Failure to disconnect the negative terminal of your battery prior to the installation of your LC6 can result in a warm tingly feeling.

(+12V) Positive Connection: Insert a 12 to 18 gauge wire into the connector labeled “+12” on the nifty connector of your LC6. Connect it to a good constant source of 12 volts (we suggest the battery), fused at 1 amp.

Ground Connection: Use the same gauge wire as you did for the positive connector and run it from the “Ground” connector on the LC6 to the negative terminal of the battery, a ground bus, or a verified ground location. The factory head unit ground is not a good ground!

Remote In: Connect a 22 to 18 gauge wire from the source unit’s remote turn-on or other trigger to the “Remote” connector on the LC6. As we previously mentioned, your LC6 is equipped with signal sensing which allows it turn on when it detects a signal at the speaker-level inputs.

Remote Out: If you are going to use the LC6 to turn on any external signal processors or amplifiers, connect an 18 to 22 gauge wire from the “Remote Out” on the LC6 to the remote turn-on of the processors or amplifiers. If you are turning on more than 3 or 4 devices you should connect this wire to a relay and route 12 volts from another source.

Once the electrical connections are complete, you may reconnect the negative terminal to your battery.

LC6 Audio Wiring

The LC6 needs to be installed in the signal path after your factory source unit or amplifier but definitely before your after-market amplifiers and/or any signal processors. You may already have guessed there are numerous ways to configure the LC6 in your audio system so we recommend you spend a little quality time planning out your system and even sketching it out on paper.

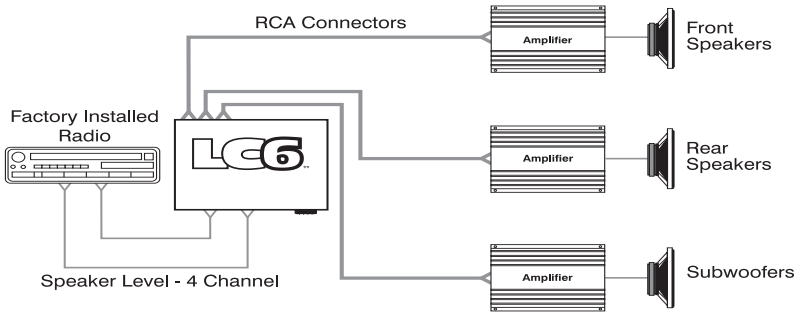


Figure 4: Interfacing with factory-installed radio

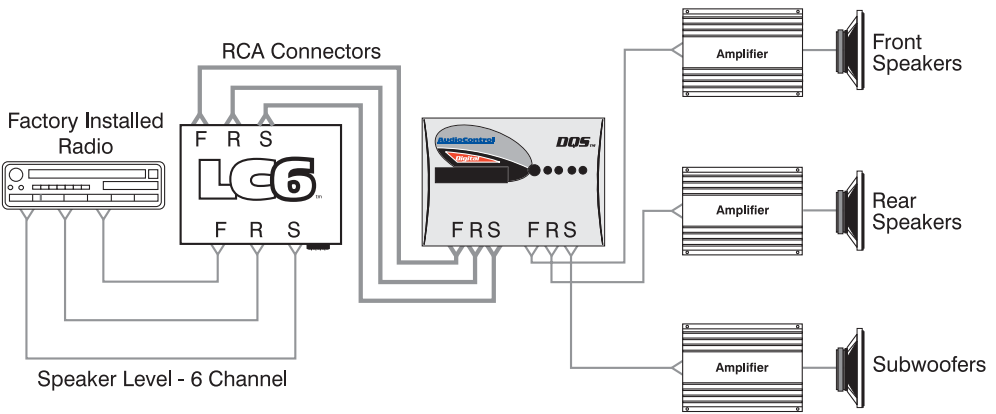


Figure 5: LC6 system with DQS equalizer

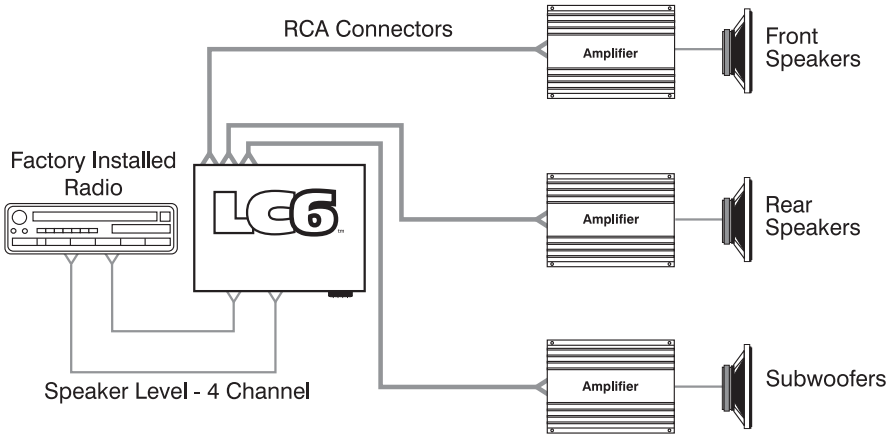


Figure 6: Automode switching - **four** input channels providing **six** output channels

Speaker-Level Inputs

The LC6 is designed to accept an amplified, speaker-level signal from a factory source unit or amplifier. You will want to refer to a factory service manual or wiring-harness schematic to determine which wires are the speakers wires for your system. If you are unsure which wires are the speaker wires, it is recommended you look at the color of the speaker wire connected to the speakers and follow them back to the factory source or amplifier. Connect the speaker wires to the “Speaker-Level Inputs” on your LC6. Make sure to get your “pluses” and “minuses” connected properly.

Pre-Amp Outputs

Connect good quality RCA connectors from these outputs to the inputs of your amplifiers. While we won’t get into the discussion as to whether plutonium cables sound better than un-obtainium cables, we will tell you that well-constructed cables are less problematic in rugged environment like your car system.

Level Matching

If you have ever listened to a friend's "killer" car audio system and heard lots of hiss, clicks or pops, then you have experienced an improperly level-matched system. When a performance autosound system is properly level matched, you should get the maximum output from your source unit and amplifiers without any clipping or that annoying hiss! The following steps will help you through the process, although at the end of the day, your ears will be your guide!

1. Set your source unit's fader and balance controls to their center positions. If your source unit has subwoofer output (and you are using it), set the output level at minimum or "OFF".
2. Disconnect the RCA cables between your LC6 and the amplifier(s). Otherwise get some earplugs.
3. Start playing some relatively dynamic music and set the volume on your source unit to about 3/4 of maximum. You should not be hearing anything at this point. If you are hearing music, go back to step #2; if you are hearing voices go see a doctor!
4. Adjust the output level controls until the "Maximized" light starts to flicker. If the "Maximized" LED does not come on but you are hearing music, fear not. The signal level from your source unit is probably low so it is not triggering the LED.
5. Set the input gains on the amplifier(s) at minimum! This is known as "turning down your gains."
6. Double check that you performed Step #5!
7. Decrease the volume control on your source unit and re-connect the RCA's between the LC6 and the external amplifier(s).
8. Now increase the volume on your source unit to your normal listening level. For some of you, this may be louder than others!
9. At this point you may find yourself going back and adjusting the "Output Level" controls on your LC6 to balance the front, rear, and subwoofer sections of your system to accommodate speaker placement and efficiency. Speakers on the rear deck of your car will probably sound louder than the ones in your doors!

Dash Control Installation *(available separately)*

Placement And Mounting

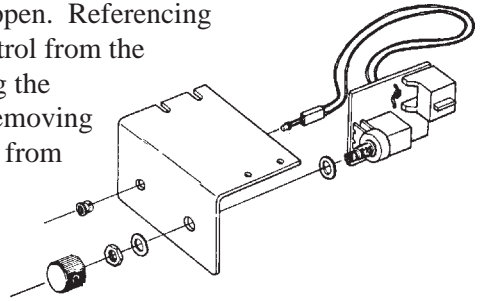
The dash control may be mounted under the dash using its own bracket or through a custom hole in the dash. It should be within reach of the driver and in a spot where the LED is plainly visible.

Dash Bracket Installation

The dash control mounts with two screws which attach to the underside of the dashboard. Slide under the dash and place the dash control in its mounting position, mark the two mounting holes, drill pilot holes, and secure with two screws.

Custom Installation

For that custom, finished look, the dash control can be flush mounted directly on the dash board (or anywhere else). We have provided an extra label to help make this happen. Referencing Figure 5, disassemble the dash control from the mounting bracket. Start by pushing the LED from its holder followed by removing the circuit board and rotary control from the bracket. Drill a 9/32" hole in the dashboard for the control along with a 1/8" hole for the lock tab and a 13/64" hole for the LED holder. Reassemble the dash control components on the dashboard and apply the new label over the openings.



Dual-Color Dash Control LED

The LED on your dash control is rainforest green and should brighten or dim when you turn the knob. Should you wish to change the color to amber, remove the plug connected to the LED and turn it 180 degrees and plug it back in.

TROUBLESHOOTING

No Power: If the Power LED on your LC6 will not turn on, check to make sure that the power wire and remote turn on wires are connected or a fuse has not blown, and there is plenty of signal present.

LC6 Turns Off Intermittently: If you are using signal sensing to turn on your LC6 and your head unit has signal-level output, your LC6 may turn off. In these situations it is recommended that you connect 12-volt trigger wire from the “Remote In” on the LC6 to a 12-volt switch wired.

Sounds Distorted: Should your system sound distorted or your speakers are moving way too much, you should make sure you have your levels matched properly and that your amplifier gains are set at minimum.

System Hiss: Check to make sure that your amplifier gains are set at the minimum level.

Low Output: Depending on the design of your factory-installed system, you may actually be connecting to a pre-amp signal instead of a speaker-level signal. Since the LC6 is a line output converter you may need to turn up the gains on the LC6 or consider adding a pre-amp line driver like the AudioControl Matrix to increase the signal level to your aftermarket amplifiers.

Maximized LED Does Not Light Up: If your system is playing music but the Maximized LED is not coming on, there is a good chance that the output voltage of your source unit is not that high. Try increasing the level control on your LC6.

IF YOU LIKE LC6, YOU’LL LOVE...

The EQS, six-channel equalizer, is the perfect trunk mount processor for those of you who want to improve the sound and detail of your vehicle. Less than ideal factory speaker locations can make even the best



speaker systems cry out for help. The equalization controls on the EQS provide you with an ideal amount of tone control to tame even the most challenging acoustical situations.



If you want to add the ultimate in system equalization and are ready to step into the digital domain, then the AudioControl **DQS**, six channel digital equalizer with memories is just for

you. The DQS offers six channels of equalization with 30 bands of precise control per channel for a total of 180 filters.

If you need a crossover for your system that keeps up with your LC6, the **6XS** is a 6-channel, 2-way crossover with breath takingly steep 24dB-per-octave slopes.

If performance is important to you, then you will appreciate the 6XS. Of course if you are just looking for deeper, chest-thumping bass, then The Epicenter our patented (U.S. patent # 4,698,842) bass restoration processor is just the hot ticket. It puts the woof back in your woofers!



And now a word from the legal department...

THE WARRANTY

People are scared of warranties. Lots of fine print. Months of waiting around. Well, fear no more, this warranty is designed to make you rave about us to your friends. It's a warranty that looks out for you and helps you resist the temptation to have your friend, "...who's good with electronics", try to repair your AudioControl product. So go ahead, read this warranty, and then take a few days to enjoy LC6 before sending in the warranty card and comments.

"Conditional" doesn't mean anything ominous. The Federal Trade Commission tells all manufacturers to use the term to indicate that certain conditions have to be met before they'll honor the warranty. If you meet all of these conditions, we will warrant all materials and workmanship on your LC6 for one year from the date you bought it (five years if it is installed by an authorized United States AudioControl dealer). We will fix or replace it, at our option, during that time.

Here are the conditional conditions:

1. You have to fill out the warranty card and send it to us within 15 days after purchasing your LC6.
2. You must keep your sales receipt for proof of purchase, showing when and from whom the unit was bought. We're not the only ones who require this, so it's a good habit to get into with any major purchase.
3. Your LC6 must have originally been purchased from an authorized AudioControl dealer. You do not have to be the original owner, but you do need a copy of the original sales slip.
4. You cannot let anybody who isn't (A) the AudioControl factory; (B) somebody authorized in writing by AudioControl to service your LC6. If anyone other than (A) or (B) messes with your LC6, that voids your warranty.
5. The warranty is also void if the serial number is altered or removed, or if LC6 has been used improperly. Now these sound like big loopholes, but here is all we mean by it.

Unwarranted abuse is (A) physical damage (don't use the LC6 for a jack stand); (B) improper connections (120 volts into the power jack can fry the poor thing); (C) sadistic things. This is the best mobile product we know how to build, but if you mount it to the front bumper of your car, something will go wrong.

6. If an authorized United States AudioControl dealer installs your LC6, the warranty is five years, otherwise the warranty is one year.

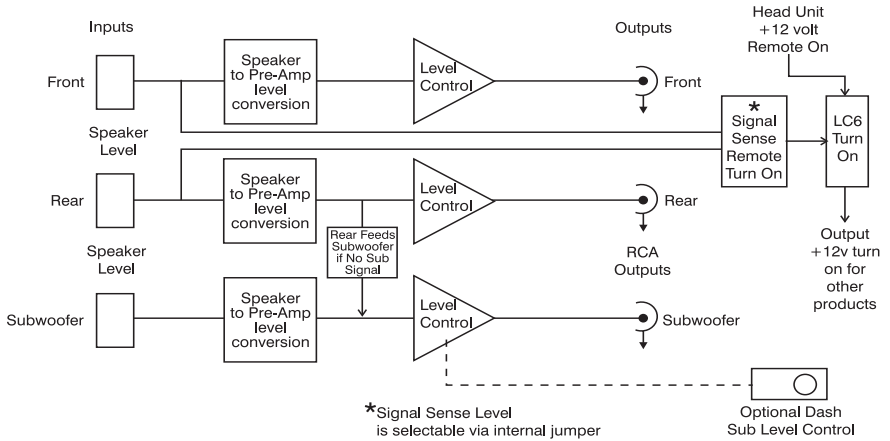
Assuming you conform to 1 through 6, and it really isn't all that hard to do, we get the option of fixing your old unit or replacing it with a new one.

LEGALESE SECTION

This is the only warranty given by AudioControl. This warranty gives you specific legal rights that vary from state to state. Promises of how well the LC6 will perform are not implied by this warranty. Other than what we have covered in this warranty, we have no obligation, express or implied. Also, we will not be obligated for direct or indirect consequential damage to your system caused by hooking up the LC6.

Failure to send in a properly completed warranty card negates any service claims.

LC6 BLOCK DIAGRAM



LC6 SPECIFICATIONS

All specifications are measured at 14.4 VDC (standard automotive voltage). As technology advances, AudioControl reserves the right to continuously change our specifications, like our Pacific Northwest weather although we are working on it.

Maximum speaker-level input	400 watts @ 4 ohms
Maximum output level	9.5Vrms
Output gain	±12 dB
Frequency response	10Hz-22kHz
Total harmonic distortion	0.01%
Input Impedance	20 Kohms
Output Impedance	150 Ohms
Power supply	High headroom PWM switching
Power draw	200mA
Recommended fuse rating	1 Amp
Size	7" W x 5.15 "D x 1.2"H
Weight	3.5 lbs

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This manual was conceived, designed, and written on a spectacularly rare, sunny, and cloudless day at our home in the typically bleak, grey, and wet Pacific Northwest Rainforest. The lattés were hot and the Heffeweizen's were cold...like our weather.

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