



AUTOSOUND BASS RESTORATION SYSTEM OWNER'S INSTALLATION MANUAL

Congratulations on buying a truly unique enhancement to any quality car stereo system. If you're super-impatient to hear the incredible improvement in bass response that the Epicenter can provide, skip to the next section (ULTRA-FAST, CAN'T WAIT HOOK-UP INSTRUCTIONS). Otherwise, we suggest you read the whole manual before proceeding.

What you can expect from your Audio Control Epicenter:

- **Depth and impact** restored to cassettes, FM reception and even CD's via patent pending Phase Coupled Activator technology. In short: **KILLER BASS!**
- **Protection** from subsonics and intermodulation with a high quality subsonic filter that eliminates power-robbing ultra-low infrasonic fluctuations which, until this time, have been a fact of life with high-powered systems.
- **Ease of control** with a single unobtrusive dashboard adjustment (while the rest of the Epicenter is mounted out of sight)
- **Highest quality**, because the Epicenter is built in the U.S.A. by an award-winning manufacturer
- **Jealous friends**, after they hear your car system.

AudioControl®
making good stereo sound better

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ULTRA-FAST, CAN'T WAIT HOOK-UP INSTRUCTIONS

IMPORTANT CAUTION FOR THE IMPATIENT! READ BEFORE PROCEEDING.

The Audio Control Epicenter can unleash incredible increases in bass — unlike anything your system has previously had to handle. Take the following precautions:

1. **BASS EQUALIZATION BOOSTS.** Make sure that any drastic low end equalization (like an EQX with the 45Hz band cranked up) has been reduced.
2. **SUBWOOFER BALANCE** If the subwoofer amp gain has been set really high, reduce it before cutting in the Epicenter, else you may end up with blown woofers, eardrums or an instant convertible
3. **APPROPRIATE SPEAKERS.** Really small, short-throw woofers will be in for a big surprise when the Epicenter takes over and react by committing suicide. (See farther on in this manual for details)
4. **SUFFICIENT POWER.** The last two octaves of bass which will be in good supply now that you have an Epicenter, can utterly drain your supply of watts. Make sure your system has enough power, or consider another amplifier and/or bi-amplification.

ULTRA-FAST HOOK-UP

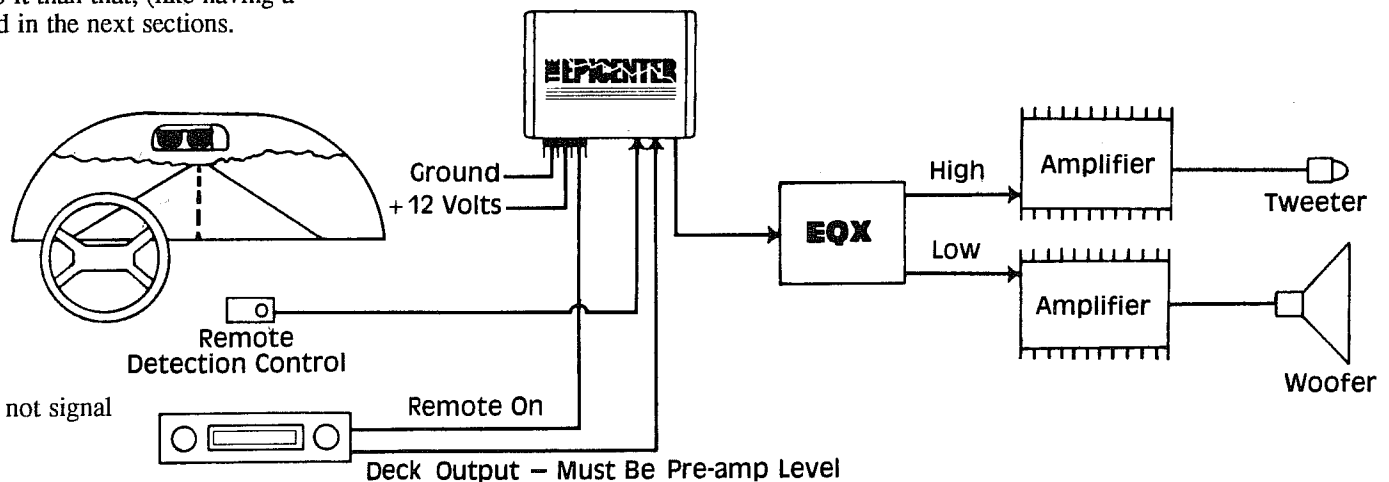
If you're a professional installer — or just hate manuals — simply hook the Epicenter between your head end unit's pre-amp outputs and the power amplifier. Period. Of course there's really a lot more to it than that, (like having a powered deck, for instance) all of which is covered in the next sections.

Notes:

- Loudness controls and Bass boosting are not needed with the Epicenter
- Subsonic filter is: 36dB/octave with restoration engaged and 18dB/octave with restoration disengaged

Remote Detection Control:

- Pull on - Push off
- Can be disassembled for thru-dash mounting
- Wire to remote head carries control voltage only, not signal



GETTING TO KNOW YOUR EPICENTER

Hmm, sounds sort of metaphysical doesn't it?

The Epicenter Main Chassis. The first thing you notice is that there aren't any controls on the Epicenter Main Chassis. That's because they're on the Dashboard Detection Control Unit.

Along one side of the Main Chassis, you'll see the Ground and +12 Volt terminals for power, and a terminal for remote activation of the Epicenter along with your power amps.

Next is the socket for the Detection Control's remote connection.

Then come the left and right input, and left and right output sockets.

On the top surface of the Epicenter is a power LED. It's handy for determining whether or not your power connections have been made correctly. Or it can be used as a very dim reading lamp if you like to hang out in your trunk.

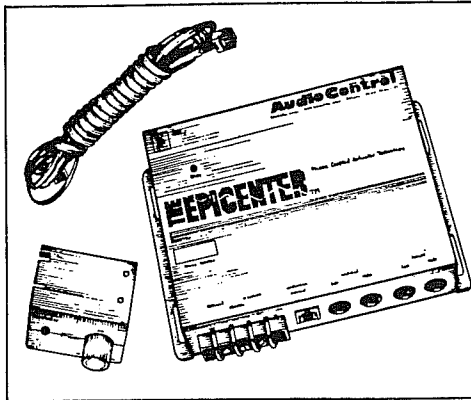
The Dashboard Detection Control Unit. The control portion of the Epicenter consists of a Detection Ratio Control and an LED which tells you when the Epicenter is restoring bass.

The Detection Ratio knob controls the restorative action of the Epicenter's patented circuitry, both in terms of what kinds of "trace elements" the circuits are looking for, and how much to restore these artifacts to their original proportion in the frequency spectrum. Think of it as a sort of sensitivity control.

When first using your Epicenter, set this control to its middle setting (12 o'clock, or "straight up"). First pull the Detection control knob out to turn on the restoration circuit. Turning the Detection Ratio towards MAX will help compensate for program material which doesn't even have the normal stingy amount of bass in it. Older tapes and many FM stations benefit from increases in the Detection Ratio.

If you're lucky enough to have an in-car CD player, or if you have made "custom" tapes with extra bass equalization added to them already, you may need to reduce the Detection Ratio slightly towards MIN. (Although CD's made from older analog tapes will still need an increase in Epicenter bass restoration.)

The other reason for adjustment to enhance or compensate for your car speaker system's ability to generate low bass. This subject is handled farther on under the subject "GETTING THE MOST FROM YOUR EPICENTER".



HOW TO INSTALL THE AUDIO CONTROL EPICENTER

A. THE MOST IMPORTANT INSTRUCTION OF ALL

Fill out the WARRANTY CARD and mail it in! It's also critical that you keep your invoice or sales slip to establish the date when you purchased your Epicenter, and hence your One Year Warranty. It's also good insurance proof should a bass-loving car thief take a fancy to your system. Insurance companies are notably reluctant to believe something as esoteric as the Epicenter was part of a system, since it doesn't fall into any of their little pre-defined niches the way decks, amps and speakers do.

B. PLACEMENT AND MOUNTING OF THE EPICENTER MAIN UNIT

PLACEMENT. Theoretically, you can place the Epicenter anywhere that it can receive power. The two most convenient places are under the dash and in the trunk. If possible, we suggest you mount it close to the power amplifier(s), for ease of connecting power and remote power-on wires. If this means trunk mounting, be sure to read the stiff lecture on cable quality, since interference can be induced over the long cable run between deck and Epicenter. Needless to say, make sure you can get at the power, detection remote, inputs and outputs.

While the Epicenter has been designed with very rugged parts, and engineered in a manner which reduced physical circuit board stress, be sure to consider the following guidelines:

- Avoid mounting the Epicenter near a heater, front of the firewall or anywhere else where it can get really hot.
- The mounting location must be safe from water seepage. Lot of trunks have seal problems. Check for old stains or moisture before settling on a permanent site for your Epicenter.
- Make sure the Epicenter can be firmly mounted without vibration. This protects connections from breakage and stress as well as the possibility of it coming UN-attached when you blast over a speed bump.
- Avoid any location where mounting screws may potentially pierce a gas tank (lots of which are in the vicinity of the trunk), gas, brake or electrical lines.

MOUNTING. The Epicenter installs just like a power amplifier, secured by four screws and lock washers through the four slots in the unit's base. You will need a screwdriver, pencil or other marking device, power drill and bits, one of which should be just under the diameter of the mounting screws. Clear the area of impressionable children and maiden aunts who may react to colorful language.

First place the Epicenter in its mounting position and mark the four screw holes. Try to keep them to the outsides of the slots if possible. Now remove the Epicenter and drill four small pilot holes. This will insure accuracy and guard against stripping out the larger holes to come. (If you're mounting the unit on a carpeted surface, cut away small sections of the carpet and pad where each hole will be.) Now drill the larger holes. Replace the Epicenter and secure tightly with four sheet metal screws and lock washers.

C. PLACEMENT AND MOUNTING OF THE EPICENTER DETECTION CONTROL

The Detection Control may be mounted under the dash in its own bracket or through the dash. It should be within reach of the driver and where the Digital Restoration LED is plainly visible.

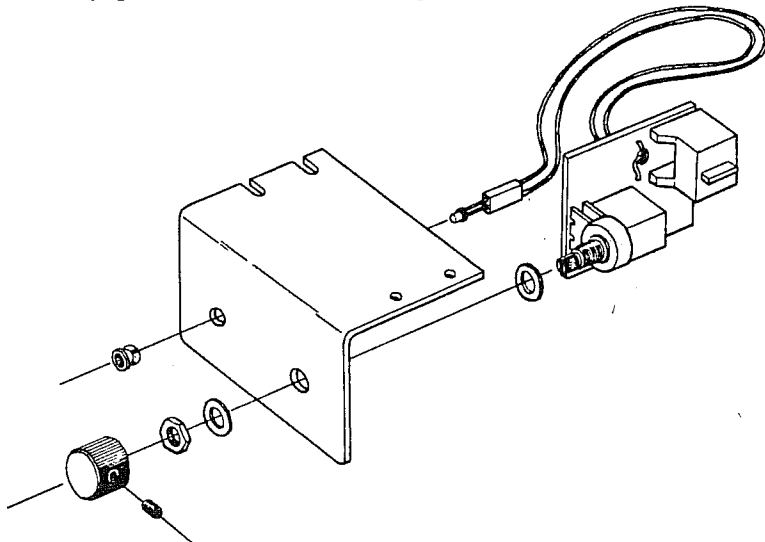
UNDER-DASH INSTALLATION. The Detection Control mounts with two screws which attach to the underside of the dashboard. You will need a screwdriver, pencil or other marking device, power drill and bits, one of which should be just under the diameter of the mounting screws. Since you're going to need to slide in upside down to get a clear view of the nether parts of the dash, it's handy to have a Faithful Assistant to hand you things.

First slide in and place the Detection Control in its mounting position. Now ask for "Forceps" and then tell your assistant you're just kidding

and want the pencil instead. Mark the two holes and remove the Detection Control. Drill the required number of holes into the dashboard underside, replace the control and secure it with two screws.

IN-DASH INSTALLATION. For that custom, finished look (or if under-dash mounting just isn't practical) the Detection Control can be mounted directly into the dashboard. We have provided an extra label to make this easier. A small allen driver, medium screwdriver, pliers, and power drill with 9/32", 13/64" and 1/8" bits are required...along with some patience and delicacy.

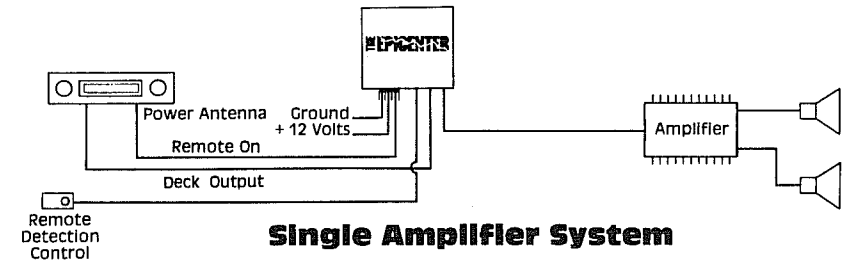
1. You will need to disassemble the Epicenter Detection Control. First gently push the LED from its black plastic holder on the Detection Control bracket. Do not remove the actual LED and wires from its housing.
2. Next, remove the circuit board and rotary control from the bracket. Take off the knob by loosening its set screw, then unscrew the lock nut and washer.
3. Now take a deep breath and drill a 9/32" hole in the dashboard (if this is a burlwood Rolls Royce dash, you're a very gutsy person).
4. Drill a 1/8" hole for the lock tab. Or remove the lock tab if you're sure you can keep the circuit board from rotating.
5. Drill a 13/64" hole for the black LED holder.
6. Remove the black plastic LED holder from the Detection Control bracket and push it into the 13/64" hole.
7. Apply the pressure-sensitive Detection Control label.
8. Insert the rotary control/circuit board into the 9/32" hole, and the LED assembly into its black plastic holder.
9. Replace the lock nut and washer and tighten securely.
10. Finally, put the knob back on and tighten its set screw.



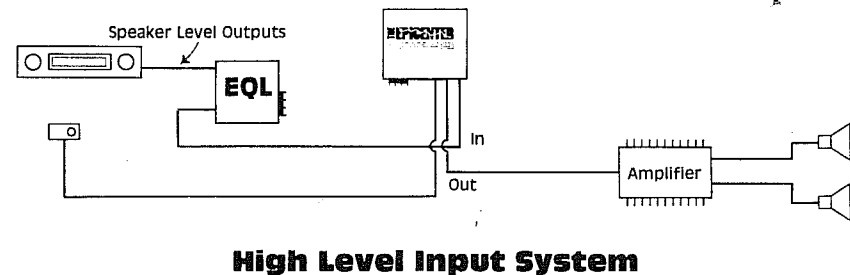
D. EPICENTER AUDIO WIRING

Planning your hook-up strategy. Okay, time to trot out the flow charts and diagrams. Because there are several ways to hook up the Epicenter, depending on what the rest of your system is like.

The simplest type of system is one with a tape deck and a single stereo power amplifier. In this case, the Epicenter goes between the tape deck and the amplifier.

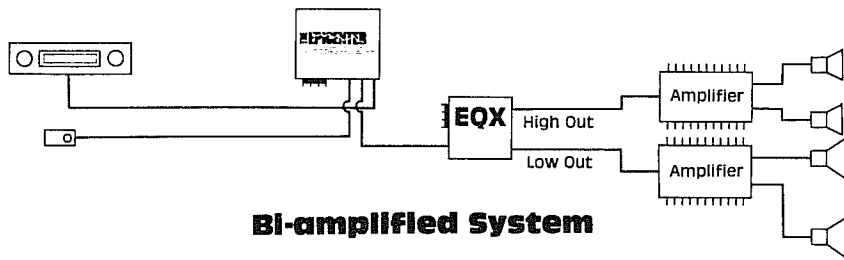


If your cassette deck doesn't have line level preamp output connections, you'll need to route its amplified speaker leads into a level matching system such as an Audio Control EQX or EQL. These units can provide the proper impedance and voltage level necessary to drive your power amplifier. Some car stereo manufacturers also make add on devices which do this. But they don't include the same sophisticated equalization. (See? We never miss a change for a plug.)

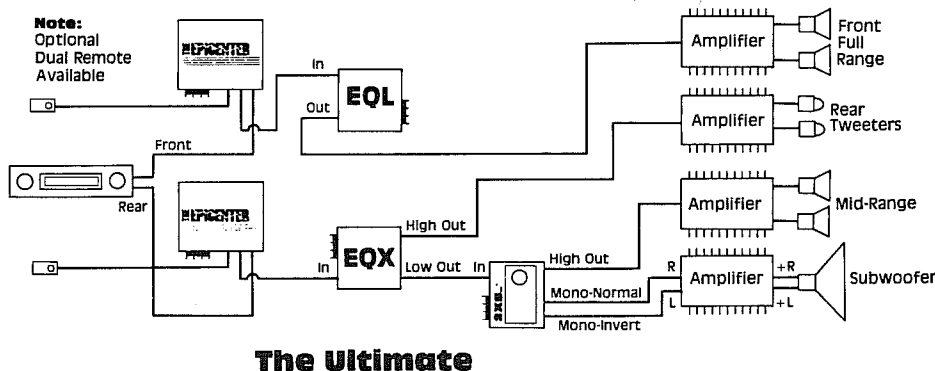


The next type of system is becoming increasingly popular: The bi-amped system with subwoofer/dual amplifiers. Naturally we've helped make it popular with our EQX Equalizer/Crossover and 2XS Electronic Crossover, so we'll use those in the following examples.

A simple bi-amp system splits the full-range output of your deck into high and low frequency bands and then routes them to separate amps. While the Epicenter produces its audible improvements in the very lowest octaves of the musical spectrum, it needs to "see" a wider band in order to detect harmonics. Optimally, it should receive inputs as high as 500Hz. Thus the Epicenter is mounted BEFORE the low pass outputs of the electronic crossover, unless the low pass frequency is around 500Hz. The same approach goes for tri-amplified systems: Place the Epicenter before the crossover that splits off bass frequencies.



For those of you contemplating really gonzo systems which can crack windshields and topple billboards when you drive along with the windows down, we've also included a diagram showing where TWO Epicenters can be placed. Actually one would do the trick if it were placed just after the electronic crossover which split highs from mids/lows. But the idea is that you can use one Epicenter to REALLY boost subwoofer output and another with a slightly less radical setting to drive mid bass speakers. If you really DO put a system like this together, don't drive past our factory unless you phone ahead so we can shore up the walls.



Type of wire. It is extremely important to use high quality co-axial stereo hook-up cables for the wiring between the head unit, the Epicenter and your power amplifier(s). Intense electro-magnetic fields are generated in an automobile which can be picked up by car stereo wiring. The increased low level wiring present when using electronic signal processing and powerful amplifiers increases the chances of creating an "antenna" which feeds this interference directly into your speakers. There it can compete with your music as audible clicking, whining, ticking and buzzing.

Theoretically, all RCA-type co-ax cables (like the ones you use to hook up your home stereo) are shielded to prevent interference. Unfortunately, cheapoid cables skimp on external shielding, since interference is not a problem in most home hi-fi hook-ups. Avoid the temptation to simply use "that old set of patch cords that came with my receiver" or super-cheap cables sold as accessories in TV or hardware stores. Consult with your Audio Control dealer to obtain high quality, well-shielded cables with securely fitting male connectors on each end. For installations such as the "gonzo system" example, you might even consider use of special audiophile hook-up cables specially designed for high-end autosound use. Remember, it's better to invest in good cables before installation, rather than try to trace interference once inferior cables are buried deep in your car's interior.

Audio wiring placement. Unlike speaker cables, which can be routed directly next to existing car wiring, we also recommend that you route line level (coaxial) wiring between the head end unit and the Epicenter away from car wiring, amplifier power supply cables or speaker wires if possible. This will help avoid induction problems, especially when you're running cables from the head unit all the way back to the car's trunk.

Also keep connections between the Epicenter and power amplifiers as short as possible to further minimize noise problems.

The one exception to these precautions is the remote wire between the Epicenter main unit and the remote Detection Control. It only carries control voltages, not an audio signal and is less prone to interference. Just make sure it doesn't rub against anything or get crimped along the way.

Actual audio connections. After all this preface, there really isn't much to say. The signal from the head-end unit (or electronic crossover) go into the INPUT sockets on the Epicenter. Outputs to the power amplifier take off of the OUTPUTS. Make sure these connections are really snug.

E. EPICENTER POWER WIRING

IMPORTANT: Disconnect the negative terminal of your car's battery before working on any electrical connections. Unless you want a little extra tingle in your life and/or a search for the fuse compartment under the dash.

Type of wire. Both +12 and ground (-) connections to the Epicenter should be made with multi-stranded wire no smaller than 16 gauge. The remote turn-on connection between power amp and the Epicenter can be made with thinner wire.

Positive (+12V) connection. If the Epicenter is being mounted near the power amp(s), you may simply make a parallel connection from the amp's +12V terminal to the Epicenter's +12V terminal. Make sure the Epicenter gets full power and not low voltage left overs from the amplifier.

Negative (ground) connection. The hook-up most open to interpretation and possible problems is the ground (negative) connection. Remember the lecture on using cables with good metal shielding so that they can protect your system from electro-magnetic interference? The metal enclosures on the wires connected to the Epicenter's inputs and outputs can act as a shield only when they are properly grounded. That means properly grounding the Epicenter itself.

For best protection from noise, there should be **ONE AND ONLY ONE** ground path to the negative side of your vehicle's electrical system. That means connecting the ground (negative) terminals of the head unit, Epicenter, and power amplifiers together and routing that common heavy gauge ground wire to someplace you're SURE is actually part of the negative side of the car's electrical system. The nearest piece of bare metal isn't necessarily a true ground. If the Epicenter is located near a properly-installed power amplifier, connect the Epicenter's ground to the power amp's ground terminator. If you're in doubt, connect the car stereo system's common ground directly to the battery's negative terminal or where the battery's negative grounding strap contacts the vehicle frame. Be careful, ground loops cause noise.

Remote turn-on connection. Sounds titillating doesn't it? Actually, what it means is that the Epicenter is turned on by a control signal from the deck or radio. Locate the remote turn-on terminals on both the Epicenter and one of your power amplifiers. Using short wires, connect the Epicenter to the power amplifier. If the Epicenter is located closer to the head unit, you can run a wire from the deck's remote turn-on wire to the Epicenter.

F. A SHORT TEST RUN.

First, re-connect the negative terminal of the car's battery. Next, make sure that any other equalizer, loudness or tone controls are either switched out of the signal chain, or turned to their center (neutral position). Place the Epicenter's Detection Control in the straight up (12 o'clock) position. Now pop in a tape and turn the system up to a pleasant level.

- Do you hear silence instead of sound? Is the power LED on the Epicenter main unit on? If not, check the wires from the head end unit to the Epicenter, or the Epicenter to the power amplifier.
- Pull out the Detection control knob and rotate the Epicenter Detection Control to the right (toward MAX). Do you hear wonderfully enhanced bass well worth the paltry sum you've paid for your Epicenter? If so, the basic connections have been made correctly. If you hear sound, but not more bass, Make certain the LED on the dash control is on. No? Then check the connection between the Epicenter main chassis and the remote Detection Control.
- Rotate the tape deck's balance control to the far left. Does the sound in the car move to the left? If it heads to the starboard (right for you landlubbers), the RIGHT and LEFT inputs or outputs need to be reversed. General practice is to use RED plugs for RIGHT and BLACK plugs for left. Make sure LEFT is LEFT all the way on through from the head end unit to the power amplifier inputs. If the problem persists, tear your seats out, turn them the other way and only drive your car in reverse.

- Now, tune in an FM station with generally namby-pamby bass and experiment with the Epicenter Detection Control to discover how much more realistic low bass can be restored.
- Get out of your car and call at least three friends with car stereo systems that could benefit from an Epicenter and extensively brag to them about how much better your system sounds.

This concludes the installation part of this manual. Stick around if possible for some explanations of how the Epicenter does what it does, and other general topics.

GENERAL EXPLANATIONS, UNSOLICITED ADVICE AND OTHER TOPICS

WHAT HAVE I BOUGHT? A DISCUSSION OF THE EPICENTER'S TECHNOLOGY

There are three interesting parts to the Epicenter's design. Obviously, the first is the patented Phase Coupled Activator bass restoration circuitry. But it also contains:

- A quality, phase-coherent subsonic filter
- Special noise-rejecting power supply

Torpedoing subsonics. Subsonics are a constant buggaboo with both car stereo and home systems. They're frequency oscillations that occur below audible frequency ranges (SUB sonics). They're caused by warps in records (and subsequent transcription to tape), variations in low bass output due to tape head effects, internal circuitry problems in some car electronics, and are even present on many CD's! The most visible occurrence is when you play a warped record on a home system. If you can SEE the speakers' woofers flutter in and out, you're seeing subsonics. While they aren't audible in themselves, they cause some very audible (and potentially destructive) problems. Problems which are just as serious in car systems.

The first is Intermodulation Distortion. The poor woofer has enough trouble zooming out and in forty to several hundred times a second producing audible bass. When it ALSO has to flutter in and out two to twenty times a second "reproducing" inaudible subsonics, problems develop. The subsonic motion reinforces and cancels the intended motion of the woofer, causing distortion in the bass frequencies.

The next problem subsonics cause is mis-use of amplifier power. The lower the frequency the more power it takes (that's the whole point of adding outboard power amps). Reproducing subsonics requires INCREDIBLE amounts of power that aren't there when you want them for audible bass notes. The result is clipping, amp overheating and general bad audio karma.

The final problem is speaker stress. Subsonics can push the woofer past its normal cone travel distance (causing a sort of klacking sound), and overheat the voice coil. The solution is a subsonic filter that cuts off inaudible frequencies before they get to your amps and speakers.

The subsonic filter in the Epicenter is unique in that it AUTOMATICALLY increases its "filtration" when the restoration circuitry is in action.

Normally, it acts as a sharp, 18dB/octave filter which eliminates virtually all of the extraneous cone flutter that plagues car stereo woofers. But when the Phase Coupled Activator circuitry restores bass information (and you need even more protection from subsonics), the filter assumes an even sharper 36dB/octave configuration. Automatically. So you'll never have to scrape your woofer cones off the car roof, even after the deepest bass notes.

Noise rejection power supply design. From an audio standpoint, car electrical systems are about as quiet as a rock concert in a motorcycle factory during an earthquake. Along with alternator whine, ignition "ticking", turn signal clicks and dash lamp dimmer buzz, some power amplifiers themselves add noise. (For a thorough discussion of this, send for our Technical Paper 103).

While the Epicenter is guaranteed not to contribute to this electronic cacophony, it must be capable of REJECTING everything else thrown at it. It does this with a special power supply that's completely isolated so it can ignore electronic trash thrown its way. The result is very quiet operation and another car stereo headache gone. If your system is noisy after the Epicenter is installed, it was noisy beforehand, too.

Phase Coupled Activator Bass Restoration Circuitry. By now, you can appreciate just how much better bass you get with the Epicenter than any equalizer. How does this work?

Fade out. Fade in. We're in the recording studio where music begins. There's LOTS of bass here. Deep, thudding kickdrums and floor toms. Rich electric bass. Ultra-low gutturing synthesizer notes. No doubt about it. Instruments (and even male singers with deep voices) can produce all sorts of low end.

So where does it go? First, even the best microphones don't pick up all the bass. But nobody cares due to all the losses that come after. Next, the sound gets recorded. Analog tape recorders are several dB down below 35Hz. Digital ones are better, but very little pop music is yet recorded digitally, so this is more of a dream than a reality.

Next, the recorded tape is "mixed" down to a single stereo master tape. Most of the time, this master tape will be used to produce all three forms of commercial recordings: Records, cassettes AND CD's. The trouble is, records are physically limited as to the amount of low bass they can contain. Low end means deeper grooves. Deeper grooves means wider grooves and that means less music per side. Besides. A low percentage of potential consumers have systems that can reproduce bass below 60Hz anyway. So even if you use a super cartridge and a high quality cassette deck to make your own tapes, you're dealing with a bass-shy medium to start with.

In general, the master tape copies made for tape and CD duplication often have reduced low bass, too, since they're pulled from the same mix. (Again, the record companies reason, most people can't tell the difference anyway.)

Next comes the problem of how much bass a commercial cassette can handle. Not as much as the blank tapes you use. While commercial cassettes have improved immensely over the last few years, most of the strides have been made in increased treble and overall signal-to-noise ratio.

The point of this whole discourse is to establish that fundamental bass — bass below 70Hz — simply gets lost or at least reduced by the time it gets to your car stereo system.

Now let's examine how the Epicenter's patented Phase Coupled Acti-

vator circuitry brings back live low bass. First, a short lesson on fundamentals and harmonics. Every sound produces harmonics which are multiples of the fundamental frequency. A 30Hz fundamental (just the kind that gets lost so easy in recorded music) has harmonics at 60Hz, 120Hz, 240Hz etc. These harmonics are such an integral part of the sound that our ears can trick us into filling in the lower note. That's why you can "hear" bass in a song played over a small portable radio.

The Epicenter takes advantage of the harmonic artifacts of a low fundamental note to restore it to the original intensity.

Back to the 30Hz note. Let's assume it's just not there by the time you tape the record and play the tape in your car. What ARE there are its residual 60Hz and 120Hz harmonics. Our Phase Coupled Activator Circuitry analyzes these mid bass notes and decides whether or not they comprise the "remains" of a lower fundamental. If they do, it restores the fundamental note to its full intensity an octave lower.

The key to the Phase Coupled Activator circuitry in the Audio Control Epicenter is that it only restores what was really there in the original musical performance, rather than making up bass just for the sake of bass. It knows when to "turn on" and when not to. The result is the restoration of MUSICAL SOUND, not just random frequencies, eliminating boominess and muddy sound.

One way it does this is to analyze stereo sound, including the differences between right and left channels. When it encounters a purely MONO high bass sound, it does not try to restore a fundamental. This means that FM announcers' voices and commercials don't sound overly bassy. The flip side is that the Epicenter will NOT restore bass in mono AM signals. A small price to pay for improved sound from tapes, FM and CD's.

WHAT YOU NEED TO GET THE MOST FROM THE EPICENTER

This is a short discussion of speakers and amplifiers. It's important, because we promise vastly increased low bass response when you install your Epicenter. But that promise can only be delivered if you have the bass reproducing equipment to match.

Speaker size and the Epicenter. Cone area and in-and-out cone excursion are directly proportional to potential bass response. The more woofer area you have, the more bass you can expect. The absolute minimum speaker size recommended for use with the Epicenter is two 6-1/2" speakers. Better yet are at least two 6x9" speakers. Anything less than that and the Epicenter's increased bass simply can't be reproduced.

Equally as important is the quality of the speakers used. Cheap speakers have less cone excursion and cheaper cone material. That is, they simply don't move out as far and thus don't push as much air. Look for speakers with large magnet structures which are used to push the voice coil and cone in and out. They'll also last longer and be less prone to voice coil burn-out while getting put through their paces by the Epicenter.

Needless to say, the Epicenter will make the most improvement if you add a subwoofer at least 8" in diameter. Ultra-low bass takes as much cone

area as you can possibly muster. That's why esoteric custom installations use multiple subwoofers up to 15 inches in diameter!

Power and the Epicenter. As we said before, bass take watts. Lotsa watts. A tweeter need only move a few thousandths of an inch to make treble sounds. A woofer has to move as much as an INCH, several hundred times a second to deliver bass. That takes most of an amp's power.

If you're running a system with a passive crossover connected to both woofers and tweeters, trouble can brew when the woofer demands virtually all the amp's power. Without getting into a complete discussion of amp clipping, suffice to say that not enough power through a passive crossover system and an Epicenter turned to MAX can result in smoked tweeters — or a least severe high end distortion.

The logical solution is a separate power amplifier with enough power to handle your own personal tastes in music volume levels. A good amp with at least 50 watts per channel will amaze you with the improvement in bass reproduction. The sound will be cleaner, bass will be tighter, faster and have more impact and the Epicenter will be able to do the whole job it was intended to do. Better yet is an electronic crossover and separate power amplifier just for bass reproduction. And if it runs a separate subwoofer system, you're starting to realize the true potential of full range, gutrocking bass. (Send for our new Technical Paper #104 for a complete discussion of the advantages to bi-/tri-/quad-/etc.-amplification).

THE EPICENTER TROUBLESHOOTING

If you make an error, the unit is designed to NOT pass signal but to remain unhurt. The power light on the unit serves double duty; it lets you know that the unit is ON, and it lets you know if there is a problem.

The power light has three moods: ON, DIM, and UNLIT.

ON The power supply is alive and well. If the Epicenter does not appear to pass signal, try bypassing it as a way of checking the audio cables.

DIM There is a short in the remote cable or in the wiring going to the LED on the remote dash control. Disconnect the remote cable at the Epicenter. If there is a problem in the cable, the power LED will change intensity to full brightness. Be sure that the wires on the dash control LED are not touching the car body (trim the LED wires if necessary). Be sure that the remote cable is not pinched or otherwise violated (for instance, having a sheet metal screw through it). An improperly wired Epicenter-to-remote cable can also cause this sort of problem.

OUT There is a short in the remote cable. Again, disconnect the remote cable at the Epicenter. If there is a problem in the cable, the power LED will illuminate. If not, use a voltmeter to check for power (and remote turn-on) at the Epicenter's barrier-strip terminals.

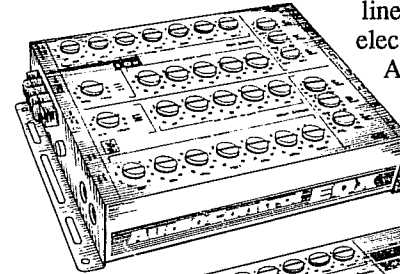
If the LED in the remote fails to illuminate when the knob is pulled OUT, check the LED on the Epicenter first, then ensure that the remote is actually plugged in and that the cable has not been violated in some way. Last, try reversing the connector on the LED.

NOTE: If you use a telephone cable other than the one supplied with the Epicenter, be sure that the new cable is wired properly.

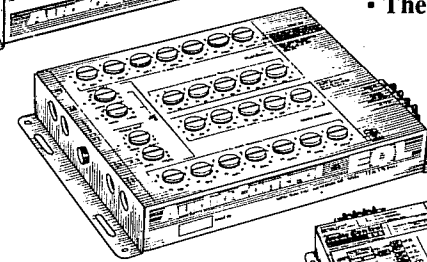
A BRAZEN PLUG FOR OTHER AUDIO CONTROL PRODUCTS

The Audio Control Epicenter is part of our Performance Match Series which includes:

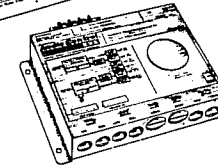
- **The EQX**, a compact audiophile-grade, digital-ready 12-band equalizer, line level preamplifier, bridging adaptor and programmable electronic crossover. Winner of the Audio/Video Magazine Autosound Grand Prix Award for best Equalizer of 1987, as well as many other industry honors.



- **The EQL**, 12-band equalizer with variable gain input line preamplifier. Same ultra-handly 5-band half-octave bass equalizer and 7-band octave stereo equalizer as the EQX.



- **The 2XS**, 2-way 18dB/octave programmable electronic crossover with 18dB/octave subsonic filter, output gain adjustment and bridging adaptor.



They're compatible with every cassette/tuner, cassette/receiver and power amplifier made and will deliver significant improvements in the sound of any car system. Check with your Audio Control dealer for the juicy details.

Also, now that you can appreciate what our bass-enhancing circuitry can do for your car, you might want to check out the original home hi-fi version, the Phase Coupled Activator. It can make the same difference in your living room...and it comes with its own built-in high quality electronic crossover for adding a home subwoofer, too.

AUDIO CONTROL EPICENTER SPECIFICATIONS

All specifications are at 14.4VDC (standard automotive voltage)

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| Total Harmonic Distortion | 0.005% |
| Signal to Noise (rated at full output) | -119dB |
| Input Impedance | 20K ohms |
| Output Impedance | 150 ohms |
| Maximum Output Level | 7.5 volts |
| Frequency Response | 27 - 20Khz ±1dB |
| Subsonic Filter | 36dB/octave @ 27Hz |
| Power Supply | Triple Isolated Transformer Balanced DC/DC Converter |
| Remote Cord Length | 20 Feet (modular phone type) |
| Size | 1.5" h x 6.1" l x 5" w |
| Country of Origin | U.S.A. |
| Patent Number | 4,698,842 |

Audio Control, Epicenter, EQX, EQL, 2XS and Phase Coupled Activator are trademarks of the Audio Control Division of Electronic Engineering & Manufacturing, Inc.

The Audio Control Epicenter Limited Warranty

People are scared of warranties. Lots of fine print. Lots of noncooperation. Months of waiting around.

Well, don't be scared of this warranty. It's 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 Audio Control Epicenter. So go ahead and read through this warranty, then enjoy your new component for a few days 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 certain conditions have to be met before they'll honor the warranty. If you honor these conditions, we will warrant all materials and workmanship on your Epicenter for ONE YEAR from the date you bought it, and will fix or replace it, at our option, during that time.

Here are the conditions that make this warranty conditional:

1. You have to fill out the warranty card and send it to us within 15 days after you purchased your Epicenter.
2. You must keep your sales slip or receipt so you have proof when and from whom you bought your Epicenter. We're not the only company to require this, so it's a good habit to get into with any stereo purchase.
3. Your Epicenter has to have been originally purchased from an authorized Audio Control dealer. You do not have to be the original owner to take advantage of the one year warranty, but the date of the purchase is still important so be sure to get a copy of the sales slip from the original owner.
4. You cannot let anybody who isn't (a) The Audio Control Factory; (b) An authorized service center; or (c) Someone authorized in writing by Audio Control to service your Epicenter. If anyone other than (a), (b), or (c) messes with your Epicenter, that voids the warranty.
5. The warranty is also void if the serial number has been altered or removed, or if the Audio Control Epicenter is used improperly. Now that sounds like a big loophole, but here is all we mean by it. Unwarranted abuse is; (a) Physical damage (our mobile products are not meant to be used as jack stands for your car); (b) Improper connection. We have done the best we can to protect the inputs, however, 120 volts into the jacks can fry the innards of the poor beast. (c) Sadistic things. This is the best mobile product we know how to manufacture, but if you use it for the front bumper of you Baja bug and get it full of water, things will go wrong.

Assuming you conform to number 1-5, and it isn't all that hard to do, we get the option of deciding whether to fix your old unit or replace it with a new one.

Legalese Section

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

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

AudioControl®

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