

KICKER®

ZR120, ZR240, ZR360, ZR600 & ZR1000 STEREO POWER AMPLIFIERS

Based on the same design philosophy as the original KICKER Amplifier, the ZR-Series amplifiers from Stillwater Designs expand and improve the standards for car audio amplifier performance. Features that defined the way an amplifier should be built, attention to detail, flexibility, and pure clean power have been retained and some important new performance/reliability features have been added.

FEATURES & CONTROLS

The design goals for the ZR-Series amps were simple yet crucial: build the ultimate amplifiers available for the brutal environment of a vehicle.

A new heatsink design provides maximum heat dissipation when air flow isn't ideal. In addition to the existing forms of protection already in effect (thermal, overvoltage, and reverse polarity), a new short circuit protection circuit will allow the amplifier to operate into a variety of loads including 1 Ohm stereo and 2 Ohm mono.

Gold plated custom tooled speaker and power connectors maximize power transfer and damping. To improve the thermal stability, sound quality, and output power we have upgraded the power supply switching MOSFETs.

Surface mount devices are used extensively throughout the design to increase reliability. Features carried over from the last generation of amplifiers include:

ZRX Crossover Module included.

Active Signal Processing Modules are less expensive than outboard signal processors and eliminate the possibility for electrical noises to enter the system.

RCA output jacks provide a simple method for daisy chaining multiple amplifiers, especially when the plug-in modules are used.

Optical isolation between the signal and power grounds has proven very effective to keep automotive electrical noises from entering the signal path.

For the best sound quality possible we have eliminated coupling capacitors from the signal path through the use of a DC servo circuit.

Silent turn on/off circuitry eliminates pops to protect your speakers and makes your system ready for competition.

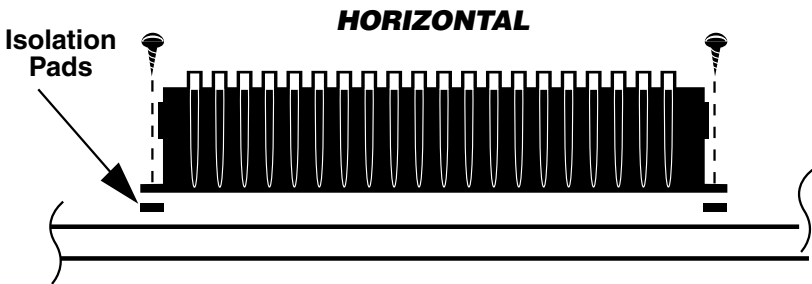
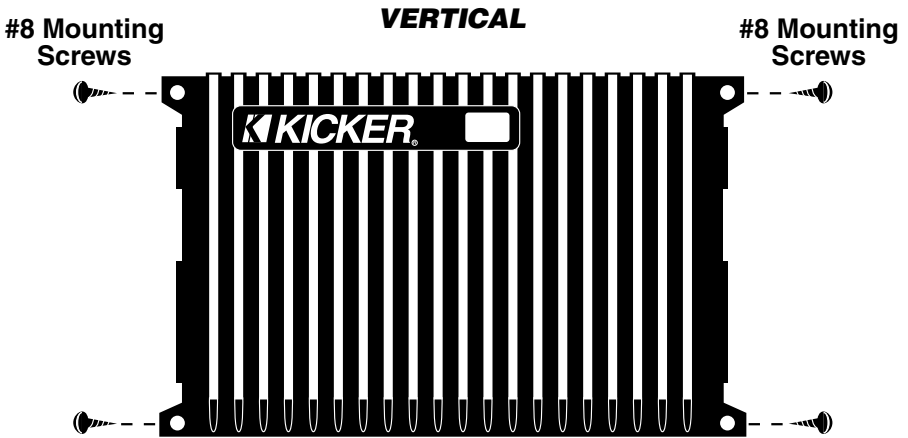
Multiple amplifiers can be daisy chained without signal degradation because the input impedance is 22,000 Ohms.

Stillwater Designs recommends that the amplifier be installed at an authorized dealer. The length of your KICKER amplifier's warranty is three times as long when installed by an authorized KICKER dealer.

AMERICA'S MUSIC MACHINESSM

MOUNTING INSTRUCTIONS

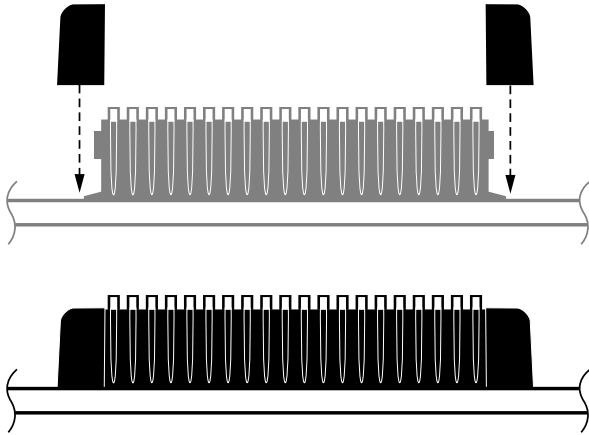
The orientation of the amplifier is critical to proper cooling. The cooling fins are designed to operate best when the amp is in a vertical position or mounted flat with the fins up. It is important to keep the chassis of the amplifier isolated from the metal of the vehicle because the heatsink is connected to signal ground for noise isolation. Grounding the heatsink will cause a ground loop. The plastic inserts in the mounting feet of the amp should remain in place as isolators. These inserts are designed to accept #8 screws for mounting.



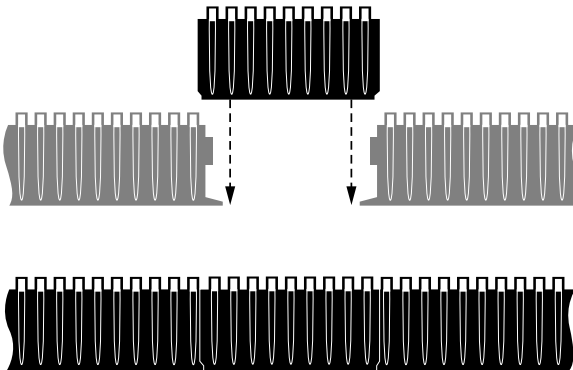
(Mounting Instructions, continued)

Use KICKER End Caps and KICKER Sink Links to cover exposed end panels and hiding wiring in multiple amplifier installations.

SUPPLIED END CAPS SNAP INTO PLACE OVER AMP END PANELS



OPTIONAL SINK LINK COVERS TWO AMPLIFIER END PANELS



WIRING INSTRUCTIONS

All speaker connectors will accept up to 8 gauge wire with these exceptions: the ZR360, ZR600, and ZR1000 power and ground connectors are designed for 4 gauge wire. It is very important that the screws in the amplifiers' terminal strips are very tight. An allen wrench is included for this purpose. Always make the ground connection first when installing this amplifier and disconnect ground last when removing it from the system.

Connect the ground wire, which is 24 inches or less, to a structural chassis member. Be sure the connection is to bare metal and securely screwed or bolted. (It is not recommended to run the ground wire to the battery.) Run a positive wire of the size shown below directly to the positive terminal of the battery and use a fuse of appropriate size within 18 inches of the battery.

This fuse protects the wire run from the battery.

Please refer to this wire gauge selection chart for minimal loss at full rated power under test conditions:

Model	Up to 4 ft	4 to 7 ft	7 to 10 ft	10 to 13 ft	13 to 16 ft	16 to 22 ft
ZR120	12	10	8	8	6	6
ZR240	8	8	6	4	4	4
ZR360	6	6	4	4	2	2
ZR600	6	6	4	2	2	2
ZR1000	2	2	2	2	0	0

When running the signal wires keep them away from all power wires in the vehicle to avoid noise. If a signal wire needs to cross power wires, try to make the junction at 90 degrees. This will have the least chance of picking up noise.

Note: in the case where the recommended wire size is larger than the amplifier's connector, it may be necessary to use a power distribution block or inline connector to adapt down to the size your amp will accept.

Inline fuse used at the battery: ZR120 = 30A, ZR240 = 60A, ZR360 = 80A, ZR600 = 90A, ZR1000 = 150A (supplied with the amplifier).

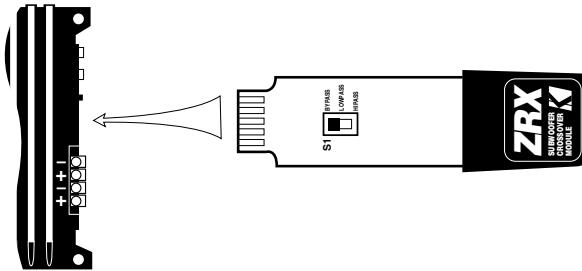
IMPORTANT INFORMATION

PLEASE READ BEFORE INSTALLING AMPLIFIER

Your new KICKER power amplifier is equipped with a ZRX Active Electronic Crossover Module installed in the Module Docking Port.

You may configure the ZRX to function as a low pass filter (12dB/octave at 80Hz) or high pass filter (12dB/octave at 100Hz) by setting the switch on the ZRX as shown in the illustration. The ZRX may also be set to bypass, in which case your amplifier will function in a full-range mode. The ZRX affects only the amplifier in which it is installed. The amplifier's output RCA jacks carry a full-range signal regardless of the settings on the ZRX.

(continued)



Setting the ZRX

Bypass Mode - Amplifier reproduces the full frequency range

Low Pass Mode - Amplifier frequencies 80Hz and lower

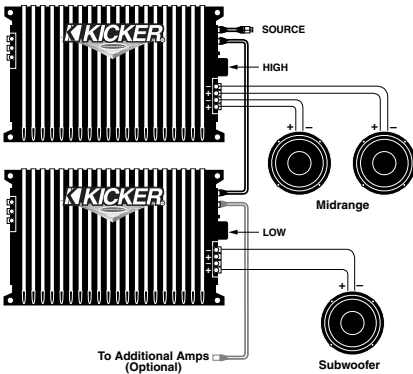
High Pass Mode - Amplifier frequencies 100Hz and higher

IMPORTANT OPERATION NOTES

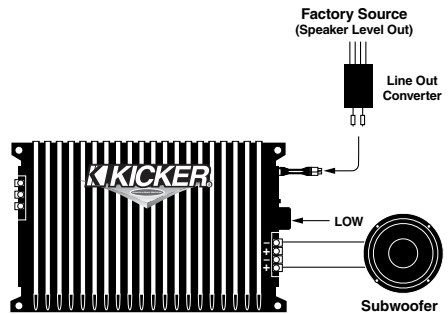
An Active Signal Processing Module must be installed in the Module Docking Port in order for the amplifier to operate. Never power up the amplifier without a module installed. Never remove or insert a module with the amplifier powered up. Failure to follow these precautions can result in damage to your speaker(s) and/or amplifier(s) which may not be covered under warranty.

Typical Installations

Daisy Chaining Two Amplifiers with ZRX Modules



Adding a KICKER Amplifier and Subwoofer to your Factory Stereo



ZRX Specifications

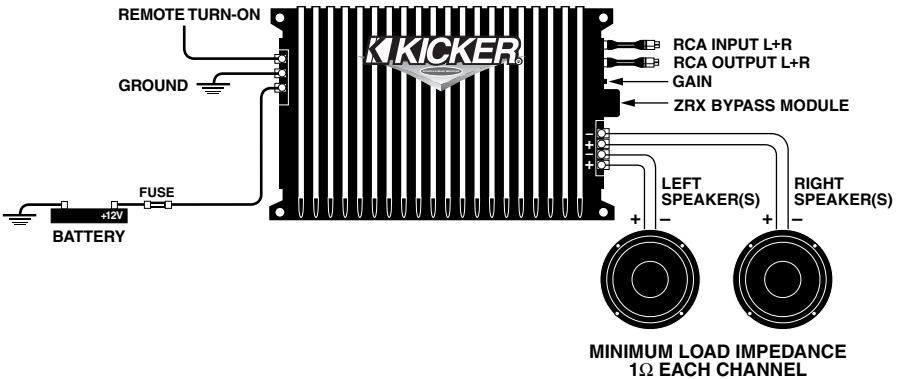
Crossover Slope	12dB/octave
Crossover Points	80Hz low pass 100Hz high pass

SYSTEM DIAGRAMS

These diagrams show minimum operating impedances for each system configuration. The ZR-Series KICKER amplifiers **Do Not** need low impedances to make full power. In stereo mode the amplifier will make all available power at 2 Ohm per channel. Likewise, 4 Ohm mono is the impedance necessary to get full power out of the amp.

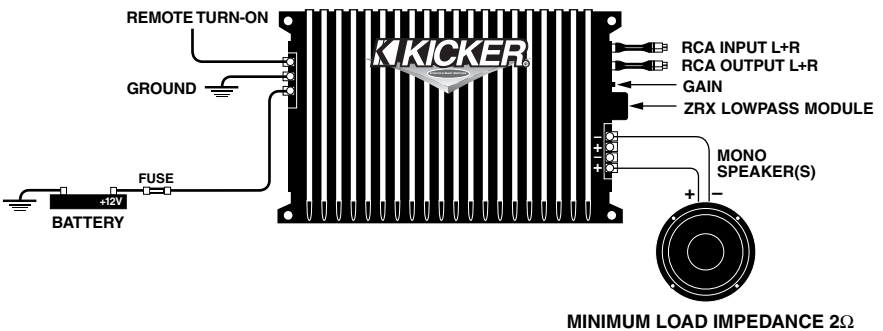
TWO CHANNEL OPERATION

In conventional stereo or two channel operation, a signal is required for each channel and a speaker load of no less than 1 Ohm is connected to each of the right and left outputs.



BRIDGED OPERATION

For bridged mono systems, an input is required to both input connectors and the speaker load of no less than 2 Ohms is connected to the left+ and right-.

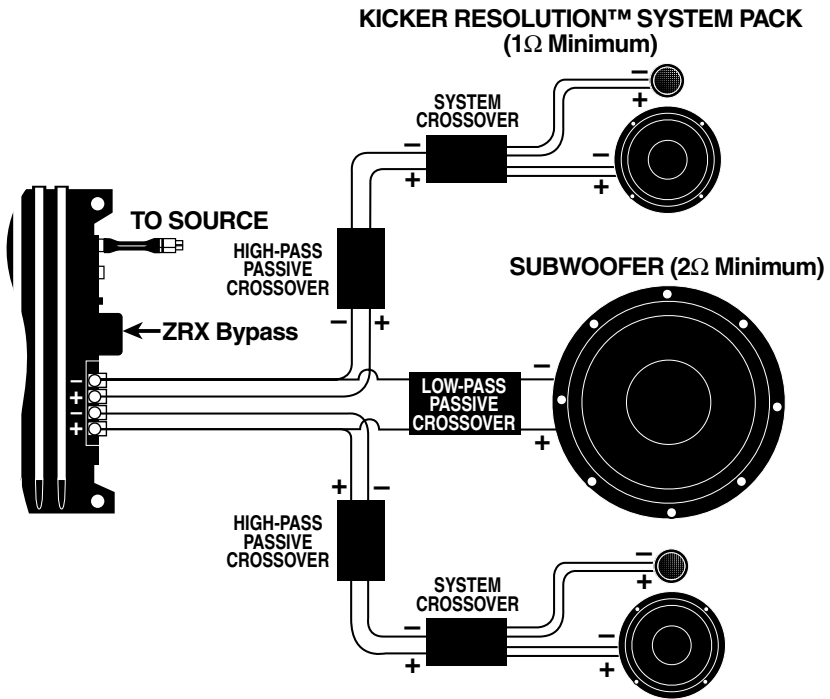


(System Diagrams, continued)

THREE CHANNEL OPERATION

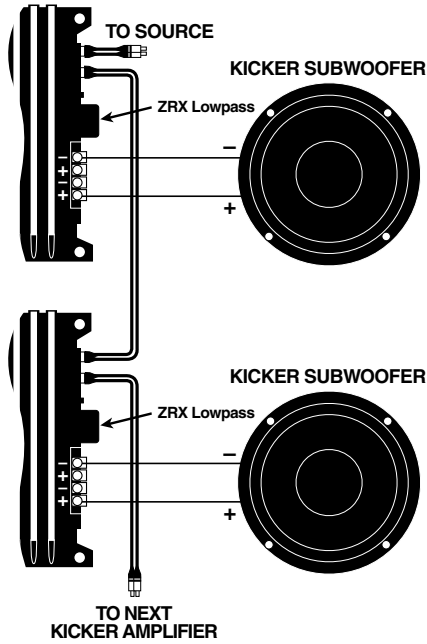
The higher frequencies (typically above 100Hz) are connected in stereo while the mono woofer(s) are connected from the left+ to the right-. These systems require the use of passive crossovers to maintain proper impedance loads at all frequencies.

Left Channel, Right Channel and Subwoofer



DAISY-CHAINING AMPLIFIERS

When operating more than one amplifier in the same frequency range it is possible to connect the input of the next amplifier to the output of the first. Daisy chaining in this manner requires only one source for several amplifiers.



SETTING GAIN CONTROLS

The gain control is provided for level matching purposes; it does not give the amplifier any more power by turning it up – its purpose is to adjust the sensitivity of the amplifier in relation to the output level provided by the source.

Start with the amp gain set to minimum by turning the control counter-clockwise. Turn the source level up until distortion is barely audible – this will be at about 75-80% of full volume. Raise the amplifier gain until distortion is just audible. The gain is now set correctly. Check the level with CD/tape and tuner to make sure the adjustment is correct for all sources.

OPTIONAL ACTIVE SIGNAL PROCESSING MODULES

All KICKER amplifiers have a Module Docking Port, which allows the use of any KICKER Module. These modules greatly increase your amplifier's versatility, and cost very little when compared to "stand alone" units with the same functions.

Active Crossover Modules:

These 2-way modules allow you to use separate amplifiers for your subwoofers, midbass drivers, midranges, or tweeters. By doing this, especially on the subwoofer, a clean and undistorted sound is available at much higher listening levels.

Each module offers a range of selectable crossover frequencies and 24dB/octave filtering.

- SWX – 60Hz, 80Hz, or 100Hz subwoofer/midbass or midrange crossover.
- MRX – 175Hz, 250Hz, or 350Hz midbass/midrange crossover.
- TWX – 3500Hz or 4500Hz midrange/tweeter crossover.

Specialty Modules:

- EEM (Electronic Enclosure Module) – When used with KICKER Freeair™ woofers, this module simulates the response of KICKER Competition™ woofers in a sealed enclosure.
- EQM (Equalization Module) – Frequency Enhancement and extension module that equalizes frequencies in the low bass region as well as the upper treble regions.
- CRM (Center/Rear Fill Module) – This module allows one amplifier to drive a center channel and rear speakers independently at the same time.
- RGX (Remote Gain Module) – An ideal amplifier enhancement module that provides a remote gain control function.
- PBM (Parametric Bass Module) is designed to meet the demand for a remote-controllable bass EQ to enhance your bass listening pleasure and to allow you to adjust the bass boost and center frequency from the comfort of the driver's seat.
- KEQ (KICKEQ) – adds adjustable Bass Boost (up to +18dB at 40Hz) and Treble Boost (up to +12dB at 18kHz).
- MMDP (Multi-Module docking Port) – Allows the use of two KICKER Active Signal Processing Modules in a single amplifier.

See your Authorized KICKER Dealer for more high performance Active Signal Processing Modules - the secret behind the amazing flexibility of KICKER amplifiers.

TROUBLE SHOOTING

Note: It is normal for the yellow trouble LED to blink when the amplifier is turned on or off. This is a function of the protection circuit looking for trouble.

- Red LED power indicator off, yellow trouble indicator off.
With a Volt Ohm Meter (VOM):
 - Check +12 Volt terminal
 - Check Ground terminal
 - Check for +12 Volts at remote turn-on terminal
- Red LED power indicator on, yellow trouble indicator off:
 - Make sure there is a module in place and the settings are correct
 - Check RCA and speaker connections
 - Test speaker outputs with a known good speaker
 - Substitute a known good signal source
- Yellow trouble LED on, red power indicator off:
 1. Amp is very hot - Thermal protection is engaged. Verify that speaker load impedance is not below specified minimums. Check area around amplifier for objects which may restrict air flow and proper cooling. If this continues to be a problem, take vehicle to an authorized Kicker dealer for evaluation.
 2. Amp is not too hot - Overcurrent protection is engaged, red power LED blinks every two seconds. This indicates that there is a short in the speaker wiring. Locate short using a VOM by checking between speaker positive and negative. If the amplifier is used in stereo, try disconnecting one channel at a time to help isolate which channel is shorted.
 3. Amp is not too hot - Voltage to amp is not within the 9-16 volt operating range. If the vehicle's charging system goes over 16 volts, the amp will shut off. If the voltage gets too low, the amp will not operate. Using a VOM identify the voltage problem and rectify.
- Alternator noise (whistling sound that follows the engine RPM).
 - Make sure that the amp case is not grounded.
 - Make sure that the source has a good ground.
 - Check routing of the RCA cable. Try substituting another RCA cable routed in a different location in the vehicle.
 - Check gain setting to make sure that it is not too high.
- Stereo image is unfocused and bass is reduced.
Check system phasing by turning the balance control from the left to the right. If the bass is more prominent when turned to either side, check speaker wiring for proper positive and negative connections. Reverse connections on one channel if necessary.

CAUTION: When jump starting the vehicle, be sure that connections made with jumper cables are correct. If improper connections are made, it can result in blown amplifier fuses as well as failure in other systems in the vehicle.

If you have more questions about the installation of your new KICKER component, see the Authorized KICKER Dealer where you purchased your component. You may also call our

SPECIFICATIONS

Model	Rated Power 4 Ω stereo (watts)	Rated Power 2 Ω stereo (watts)	Rated Power 1 Ω stereo (watts)	Rated Power 4 Ω Bridged Mono (watts)	Rated Power 2.66 Ω Bridged Mono (watts)	Rated Power 2 Ω Bridged Mono (watts)	Dimensions 2.75H x 10W (Inches)
ZR1000	250 x 2	500 x 2	350 x 2	1000	1000	700	23.15L
ZR600	150 x 2	300 x 2	275 x 2	600	600	550	19.85L
ZR360	90 x 2	180 x 2	200 x 2	360	400	400	17.1L
ZR240	60 x 2	120 x 2	150 x 2	240	300	300	14.35L
ZR120	30 x 2	60 x 2	90 x 2	120	180	180	11.05L

Specifications common to all models

Maximum Distortion at Rated Power, 4 Ω Stereo, 12.5-16VDC: 0.02%
 Frequency Response: 10Hz-28kHz; +0, -1dB
 Signal-to-Noise Ratio: >100dB, unweighted, re: rated power
 Input Impedance: 22k Ω
 Input Sensitivity: 150mV-3V RMS

ELECTRONICS LIMITED WARRANTY

Stillwater Designs warrants this product to be free from defects in material and workmanship under normal use for a period of **three (3) years from date of original purchase when installed by an Authorized KICKER Dealer or one (1) year from date of original purchase if not installed by an Authorized KICKER Dealer.** If this product is labeled "B Stock", it is warranted for one (1) year from date of purchase, regardless of place of installation. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction during the warranty period, Stillwater Designs will replace or repair (at its discretion) the defective merchandise with equivalent merchandise at no charge. Warranty replacements on "B-Stock" merchandise may have cosmetic scratches and blemishes. Discontinued products may be replaced with equivalent products.

This warranty is valid only for the **original purchaser** and is not extended to owners of the product subsequent to the original purchaser. Any applicable implied warranties are limited in duration to a period of the express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you.

This warranty gives you specific legal rights; however you may have other rights that vary from state to state.

WHAT TO DO IF YOU NEED WARRANTY OR SERVICE

Defective merchandise must be returned to your local Authorized Stillwater Designs (Kicker/Impulse) Dealer for warranty. Assistance in locating an Authorized Dealer can be obtained by writing or calling Stillwater Designs direct. You can confirm that a dealer is authorized by asking to see a current authorized dealer window decal.

If it becomes necessary for you to return defective merchandise, call the Kicker Customer Service Department at (405)624-8510 for a Return Authorization (RA) number. Package all defective items in the original container or in a package that will prevent shipping damage, and return to

Stillwater Designs, 5021 North Perkins Road, Stillwater, OK 74075

The RA number must be clearly marked on the outside of the package. Return only defective components. Non-defective items received will be returned freight collect.

Include a **dated proof-of-purchase** from an Authorized Dealer. Warranty expiration on items returned without proof-of-purchase will be determined from the manufacturing date code. Coverage may be invalidated if this date is greater than one (1) year previous to the date item is sent in. Freight must be prepaid; items received freight collect will be refused.

Failure to follow these steps may void your warranty. Any questions can be directed to the Kicker Customer Service Department at (405)624-8510.

WHAT IS NOT COVERED?

This warranty is valid only if the product is used for the purpose for which it was designed. It does not cover:

- Products purchased from an unauthorized dealer.
- Damage due to improper installation
- Damage caused by exposure to water, excessive heat, chemical cleaners, and/or UV radiation.
- Damage through negligence, misuse, accident or abuse. Repeated returns for the same damage may be considered abuse.
- Freight damage.
- The cost of shipping product to Stillwater Designs.
- Items previously repaired or modified by any unauthorized repair facility.
- Items returned from unauthorized individuals or dealers.
- Return shipping on non-defective items.
- Products with tampered or missing barcode labels.
- Products returned without a Return Authorization (RA) number.

HOW LONG WILL IT TAKE?

Stillwater Designs maintains a goal of 24-hour service for all returns. Delays may be incurred if lack of replacement inventory or parts is encountered.

INTERNATIONAL WARRANTY

Contact your International Stillwater Designs dealer or distributor concerning specific procedures for your country's warranty policies



P.O. BOX 459 • STILLWATER, OKLAHOMA 74076 • 405 624-8510

STILLWATER
Designs®

WARNING:

KICKER components are capable of producing sound levels that can permanently damage your hearing! Turning up a system to a level that has audible distortion is more damaging to your ears than listening to an undistorted system at the same volume level. The threshold of pain is always an indicator that the sound level is too loud and may permanently damage your hearing. **Please use common sense when controlling volume!**

FEBRUARY 2000