

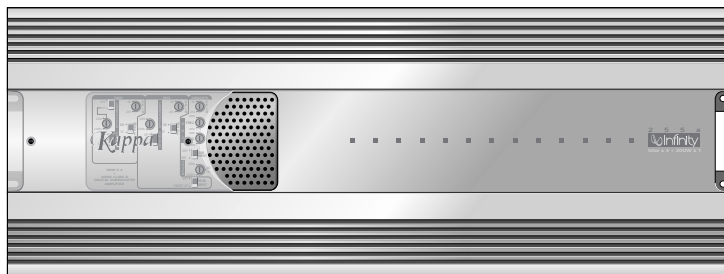


# Infinity®

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*Kappa*

255a 5-Ch Power Amplifier



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**Owner's Manual  
Installation Guide**

# KAPPA 255A POWER AMPLIFIER

The Kappa 255a is a member of Infinity's new Kappa series of mobile power amplifiers. Housed within the sleek, extruded aluminum frame, you'll find five channels of amplification – four for full-range, midrange, or high-frequency reproduction and a 200 watt class-D channel to efficiently power a subwoofer. This unique “hybrid” amplifier features a flexible integrated crossover so you can easily configure the Kappa 255a for a front, rear, and constant bass system, or for a three-way system with separate midbass or tweeters.

## KAPPA 255A AMPLIFIER FEATURES...

The Kappa 255a is a 5-channel power amplifier that offers full-range stereo and bridged-mono operation on four analog channels and band-limited mono operation on a class-D channel for subwoofer applications. The front/rear amplifiers are rated at 50 watts (rms) per channel into a 4-ohm load, while the subwoofer channel is rated at 200 watts (rms) into a 4-ohm load. In bridged-mono configurations, front and rear amplifiers can deliver up to 150 watts (rms) for the same load. The Kappa 255a also features:

- 2-ohm operation, rated at 75 watts (rms) per channel for front and rear channels and 300 watts (rms) for the subwoofer channel
- Bridge/stereo switches for fast system setup
- Built-in 12 dB-per-octave electronic crossovers, variable from 32 to 320 Hz, with an “x15” front-channel switch (to increase the frequency range from 480 Hz to 4.8 kHz)
- Dynamic Bass Optimizer™ (DBO) 12 dB-per-octave subsonic filter with variable frequency (20 to 80 Hz) and Q for enhancing subwoofer low frequencies while conserving amplifier power
- Front and rear channels, individually selectable as high-pass, low-pass, or through-pass
- External switch for subwoofer inputs allows direct connection to source units with subwoofer outputs
- Amplifier input sensitivity controls to match a wide range of input signal levels from 250 mV to 9 V
- Five protection levels guard against over-voltage, under-voltage, over-power, over-temperature, and over-current situations
- 2-color LED array indicates green when power is on and orange when protection is activated
- Industrial-grade, gold-plated, “pre-wire and plug-in” connectors for an easy-to-install high-quality interface
- Transparent control cover to deter tampering yet provide a clear view of installation settings
- Built-in automotive type fuses to protect the amplifier
- Unibloc™ chassis provides improved heat-sink capacity and exceptional RFI shielding characteristics

## ABOUT THE WARRANTY...

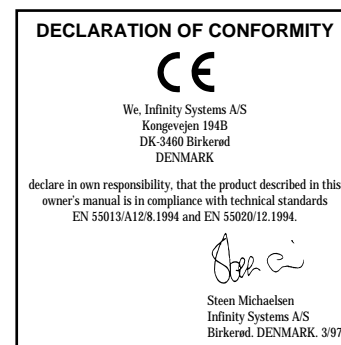
You've selected a premium product that offers superior performance and advanced materials, resulting from over 25 years of car audio design. This Infinity product is made with our ongoing dedication to creating the best consumer audio products possible. As a result, you can expect your new Kappa Power Amplifier to provide you with many years of listening enjoyment.

All Infinity Automotive Products carry a limited parts and labor warranty (see the enclosed warranty card), so retain the bill of sale to protect your purchase and to aid us with any service-related questions you may have.

## ABOUT THIS MANUAL...

To attain maximum amplifier performance, we encourage you to read the remaining pages before installing and operating your new Infinity Kappa Power Amplifier. Especially review the *Applications* section (on the next two pages) for ideas on designing a system. Also, save these instructions for future reference.

**IMPORTANT: Installation of automotive stereo components can require extensive experience in performing a variety of electrical, and mechanical procedures. Although these instructions explain how to install a Kappa Power Amplifier in a general sense, they do not show the exact installation methods for your particular vehicle. If you do not have the experience, do not attempt the installation yourself; instead ask your Authorized Infinity Car Audio Dealer about professional installation options.**



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# APPLICATIONS

Enclosed are several diagrams to help you plan your own system installation. Figures 1 through 3 (on pages 3 and 4) show how to configure the Kappa 255a to drive front and rear speakers and a subwoofer, tweeters and midrange speakers and a pair of subwoofers, and a tweeter/midrange component set, midbass speakers, and a subwoofer.

Figure 1. This wiring diagram shows a Kappa 255a amplifier driving front and rear pairs of full-range speakers and a single subwoofer.

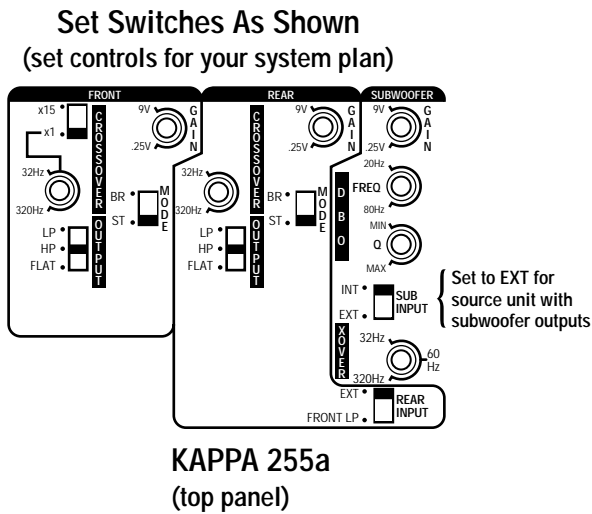
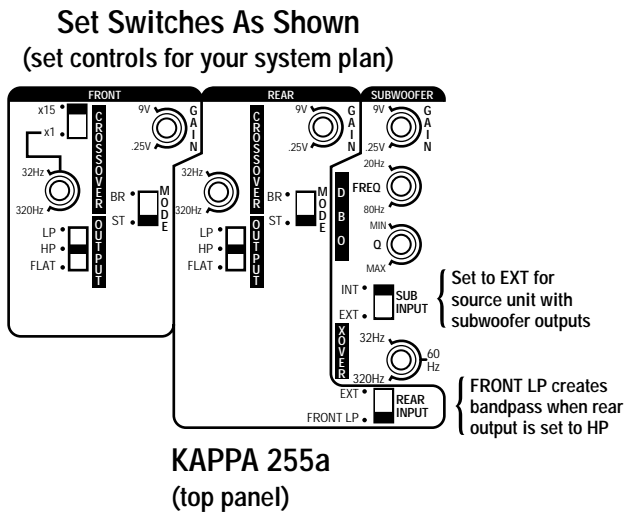
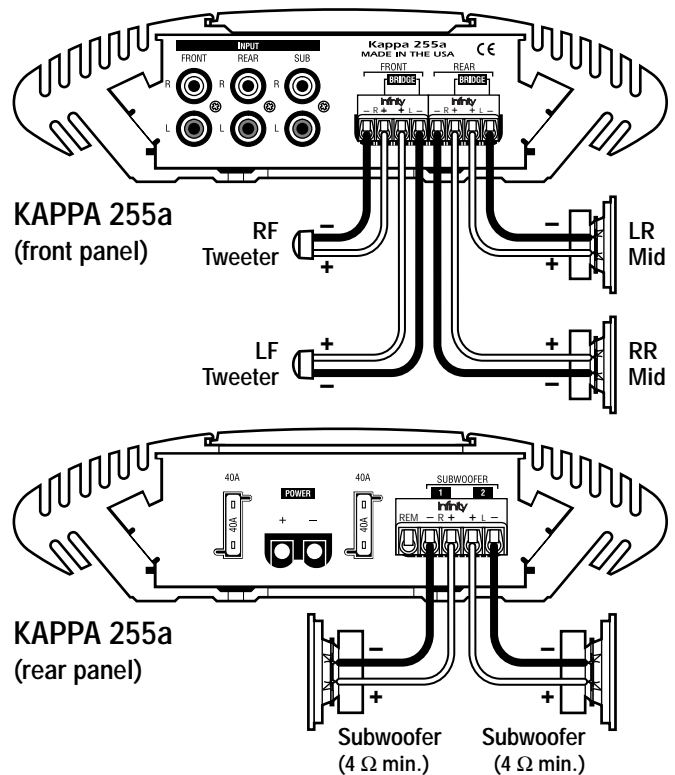
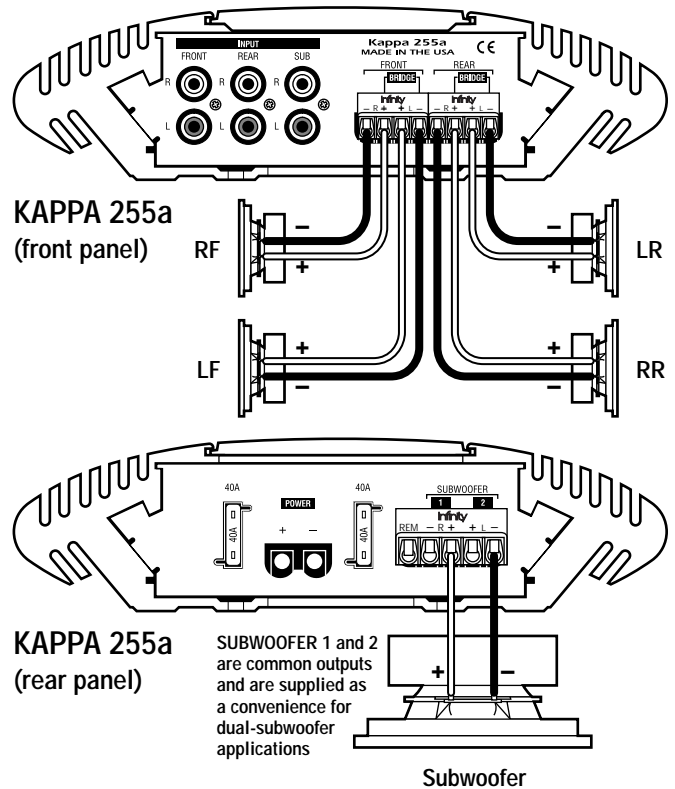


Figure 2. This wiring diagram shows a Kappa 255a amplifier driving a pair of tweeters, a pair of midrange speakers, and a pair of subwoofers (4 Ω minimum).



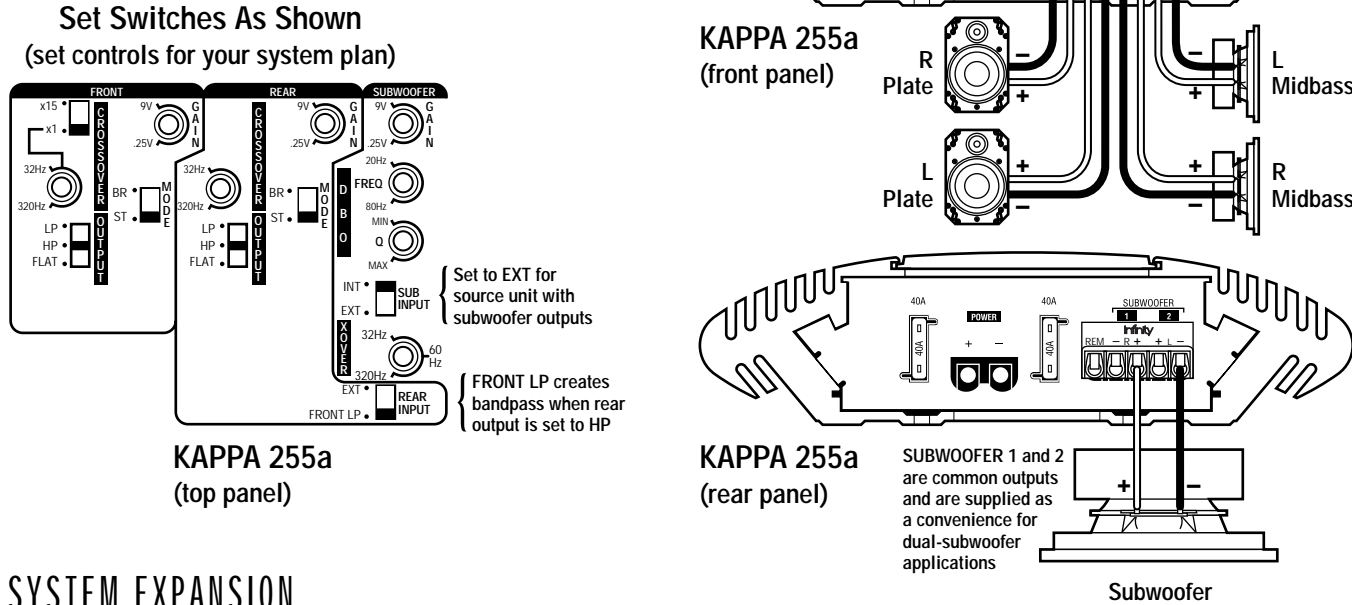
For system expansion, see Figure 4 on the next page.

NOTE: For simplicity, Figures 1 through 4 do not show power, remote, and input connections.



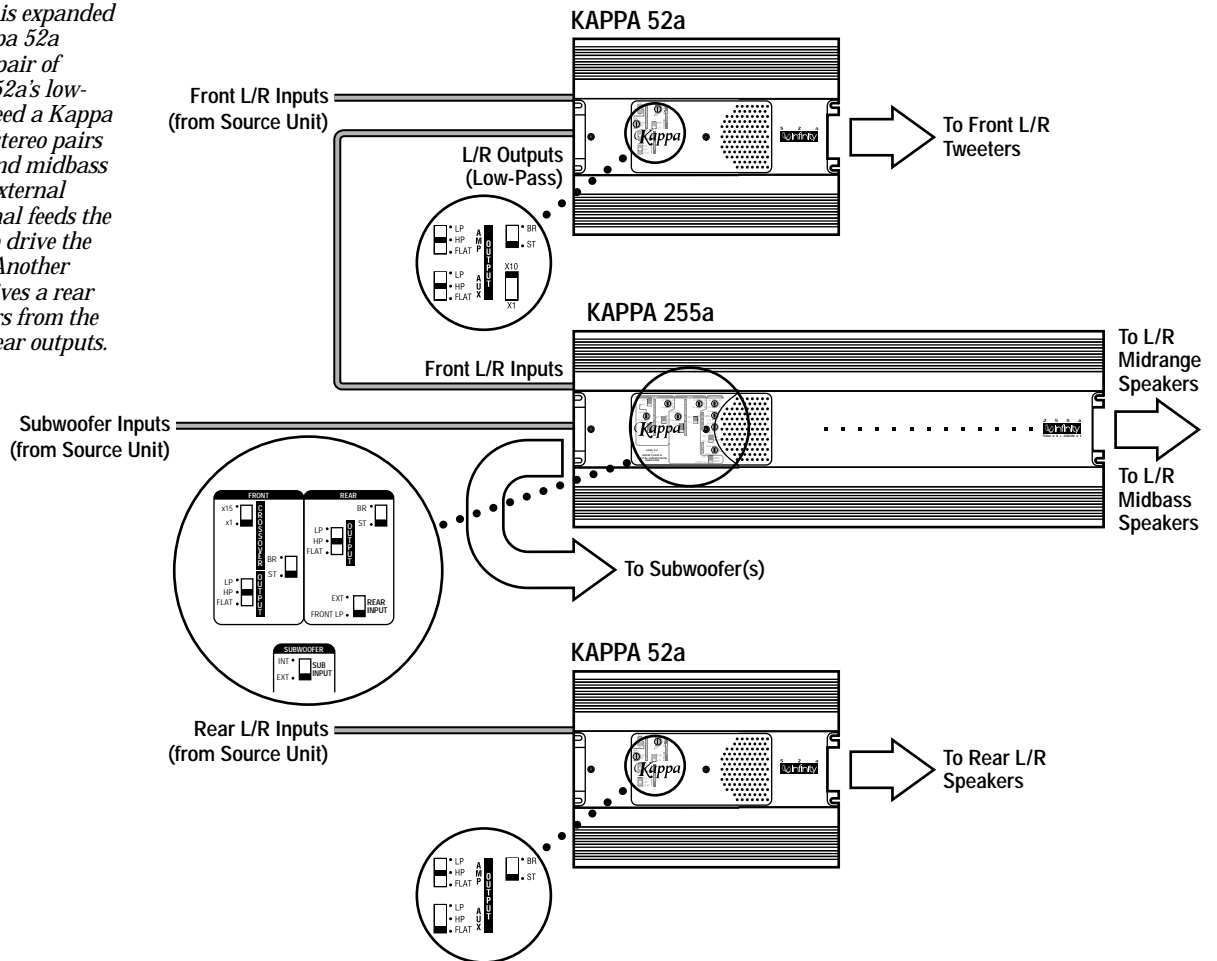
# APPLICATIONS (continued)

Figure 3. This wiring diagram shows a Kappa 255a amplifier driving a front set of tweeter/midrange components, a rear pair of midbass speakers, and a single subwoofer.



# SYSTEM EXPANSION

Figure 4. In this expanded system, a Kappa 52a drives a front pair of tweeters. The 52a's low-pass outputs feed a Kappa 255a to drive stereo pairs of midrange and midbass speakers. An external subwoofer signal feeds the Kappa 255a to drive the subwoofer(s). Another Kappa 52a drives a rear pair of speakers from the source unit's rear outputs.



## PRECAUTIONS AND NOTES

- The Kappa 255a has five levels of circuit protection that monitor the amplifier and will shut it down if the electrical system voltage drops below 10 Vdc or exceeds 15.5 Vdc, temperatures are above 194° F (90° C), short circuits occur, or current draw exceeds product specifications. For best performance, check the intended mounting site to make sure the operating environment does not create conditions that will trigger circuit protection.
- Prior to installation, turn off all audio systems and other electrical devices. Also disconnect the (-) negative lead from the vehicle's battery.
- At the installation site, locate and make a note of all fuel lines, hydraulic brake lines, and electrical wiring. Use extreme caution when cutting or drilling in and around these areas.
- Use the amplifier as a mounting template to mark locations for the mounting holes.
- Check clearances on both sides of a planned mounting surface before drilling any holes or installing any screws. Remember that mounting screws can extend up to an inch behind the surface.
- Always wear protective eyewear when using tools.
- The Kappa 255a uses gold-plated, industrial-grade Weco® plug-in connectors for power and speaker wiring. Because of precision tolerances, do not insert the connectors into the amplifier without pre-wiring them first. Once the wires are fastened in each shell, they provide additional gripping area for easy connector removal.
- When routing cables, keep input signal cables away from power cables and output speaker wires, as shown in Figure 5 (below).
- When making connections, make sure that each connection is clean and properly secured. Observe the polarity markings on the front and rear panels. Refer to the application drawings (Figures 1 through 3 on pages 3 and 4) to set up the amplifier for operation of various configurations.
- If the amplifier's fuses need replacement, use only the same rating and type as replacements. Do not substitute another kind.

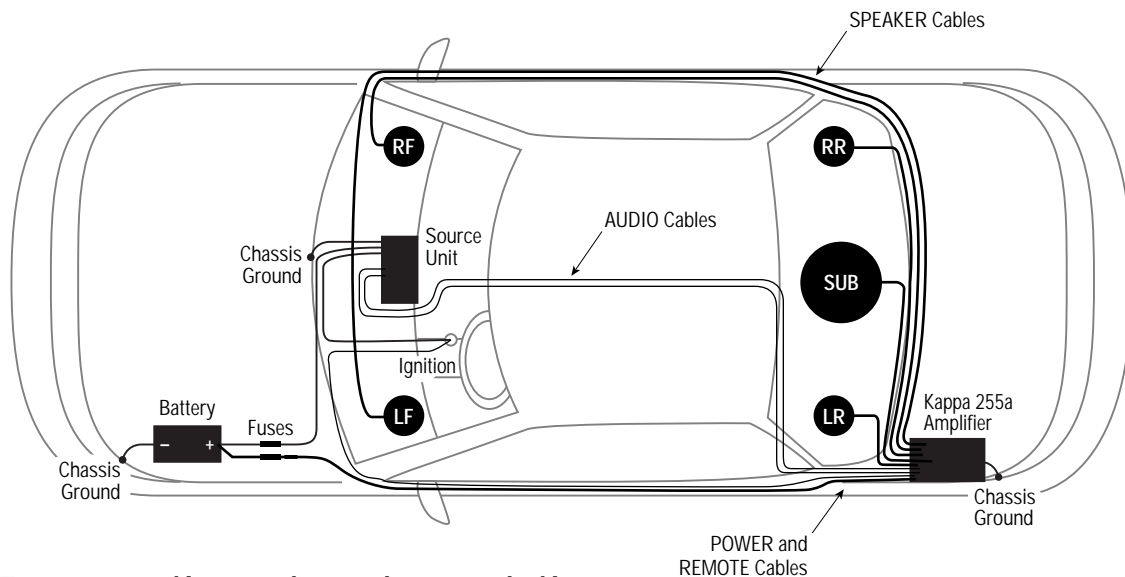


Figure 5. To minimize possible noise pickup, use this suggested cable routing scheme to plan your amplifier installation.

# INSTALLATION

The Kappa 255a is easy to install. For optimum performance, we recommend using high-quality, twisted-pair shielded RCA audio cables and 14-gauge or larger speaker wire. Also, you'll need a minimum of 10-gauge stranded copper wire (e.g., red and black jackets) for the power connections. Use 18-gauge (e.g., blue jacket) wire for remote turn-on.

Depending on your total system plan, allow for adequate time and the possibility of overnight storage of your vehicle, since it may take more than one day to complete the installation.

## PARTS LIST...

Examine and verify that the package includes the following items:

- (1) Kappa 255a Power Amplifier
- (2) Spare ATC fast-blow fuses (40 A)
- (1) Control cover with (2) machine screws
- (1) Weco 5-pin audio connector
- (2) Weco 4-pin audio connectors
- (1) Weco 2-pin power connector
- (4) #8 mounting screws

## MOUNTING THE AMPLIFIER...

The Kappa 255a can be mounted in virtually any location **inside** the vehicle. However, make sure to keep the amplifier away from heater vents or ducts.

1. At the chosen site, use the amplifier as a mounting template and mark locations of the four mounting holes.
2. Drill a small pilot hole at each marked location.
3. Mount the amplifier and securely tighten the mounting screws.

## WIRING THE AMPLIFIER...

Refer to Figure 6 (below) for details of the Kappa 255a's front and rear panel connections.

1. For power, remote, and speaker wires, strip 1/4" off one end of each jacket to reveal bare wire for insertion into the Weco connectors.
2. Using the Weco 2-pin power connector, connect a black wire from the nearest bare-metal chassis component to the (-) terminal. Then, connect a red wire from the vehicle's +12-volt battery terminal to the (+) terminal.
3. Make sure the wires are firmly seated in the Weco 2-pin connector and that each screw is completely tightened. Insert the wired connector into the POWER socket (on the amplifier's rear panel). Press it in until it stops.

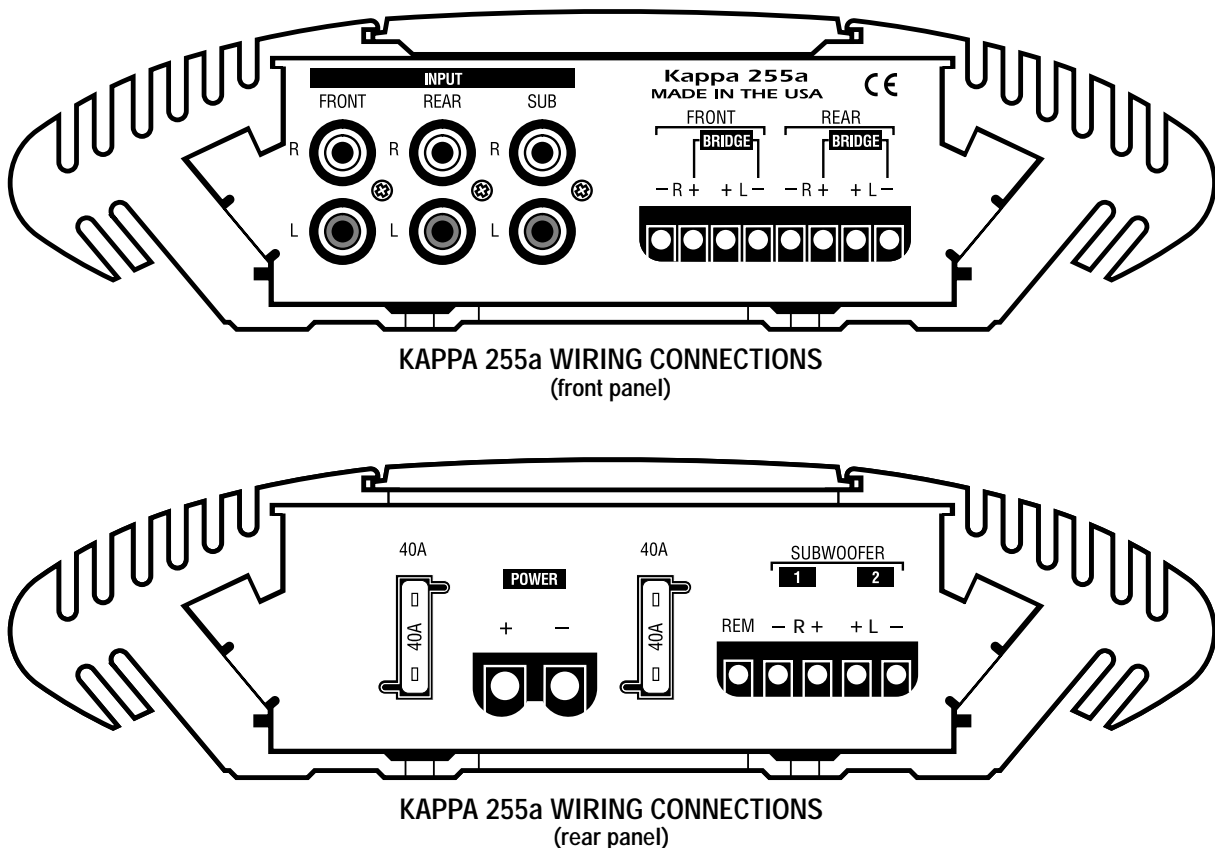


Figure 6. Wiring connections for the Kappa 255a amplifier.

## INSTALLATION (continued)

- Using the Weco 5-pin connector, connect a blue wire from the source unit's remote connection to the REM terminal. Depending on polarity requirements (see Figures 1 through 3 on pages 3 and 4), connect speaker wires from the subwoofer(s) to the L and R (+ and -) terminals, as required by your system plan.
- Make sure the wires are firmly seated in the Weco 5-pin connector and that each screw is completely tightened. Insert the wired Weco 5-pin connector into the SUBWOOFER socket (on the amplifier's rear panel). Press it in until it stops.
- Using Weco 4-pin connectors, connect speaker wires from the front and rear speakers to the amplifier. Depending on your system plan (see Figures 1 through 3 on pages 3 and 4), match the polarities on the L and R (+ and -) terminals.
 

*NOTE: In 3-way applications, the rear amplifier provides bandpass channels to drive midrange or midbass speakers.*
- Make sure the wires are firmly seated in each Weco 4-pin connector and that each screw is completely tightened. Insert the wired Weco 4-pin connectors into the FRONT and REAR sockets (on the amplifier's front panel). Press each one in until it stops.
- Connect RCA cables from a source unit to the L/R, FRONT/REAR INPUT jacks. If the source unit has subwoofer outputs, also connect a pair of RCA cables from those jacks to the SUB INPUT jacks and set the SUB INPUT switch to EXT (see Figure 7).

### SETTING THE CROSSOVERS...

- To use the Kappa 255a in a front/rear system, set the CROSSOVER controls to frequencies recommended by the speaker manufacturer (see Figure 7). If the value is unknown, set the control midway.
- For a 3-way system, set the OUTPUT and REAR INPUT switches to create the appropriate bandpass filters (see Figures 2 and 3 on pages 3 and 4).

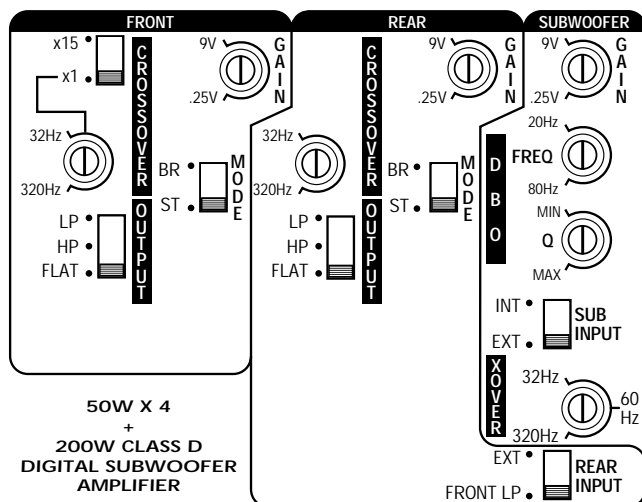


Figure 7. Kappa 255a controls for crossover, input, output, and DBO (Dynamic Bass Optimizer).

### SETTING INPUT SENSITIVITY...

Initially, turn the front and rear input sensitivity GAIN controls to their minimum (counter-clockwise) positions (refer to Figure 7).

- Reconnect the (-) negative lead to your vehicle's battery. Apply power to the audio system and play a favorite music track from CD or tape.

*NOTE: After the source unit is on, green LEDs (on the top panel) will illuminate, indicating the amplifier is on. If not, check the wiring, especially the remote connection from the source unit. Also refer to "Troubleshooting" on the next page.*

- On the source unit, increase the volume control to maximum position. Slowly increase the Front and Rear GAIN controls (clockwise) towards three o'clock and, at the same time, listen to the quality of the reproduced sound. At some point, you'll hear distortion on the music peaks. Stop the adjustment and turn it back slightly.

### SETTING DBO...

Dynamic Bass Optimizer (DBO) is a new approach to enhancing low-frequency reproduction in a vehicle. Conventional bass boost controls add bass at a fixed frequency and cause the amplifier to consume considerable power. DBO conserves valuable power at the lowest frequencies and allows you to adjust the level and "character" of the bass sound, instead of just the amount of boom.

Since a subwoofer in a tuned box is given to overexcursion below the tuned frequency, set the FREQ control below the box's resonant (tuned) frequency (see Figure 8 on the next page). Power typically wasted in this region will now be conserved and instead be available for frequencies the enclosure will reproduce. Use the Q control to boost the bass at the set frequency by as much as 12 dB (at MAX position - see Figure 8 on the next page).

For sealed enclosures, use DBO to enhance the output so it sounds more like a tuned box. This is a result of 12 dB of rolloff being added to the enclosure's rolloff and a flattening of frequency response (at the curve's knee) when Q is boosted.

For infinite baffles, set the FREQ control to the speaker's  $F_s$  value (to keep the subwoofer from trying to create bass below the resonant frequency) and adjust the Q control according to personal taste.

### INSTALLING THE CONTROL COVER...

After wiring and testing the Kappa 255a amplifier, install the control cover using the enclosed machine screws to deter tampering and help seal out dust.

*NOTE: Do not over-tighten the machine screws. Doing so may crack the cover.*

## TROUBLESHOOTING

Use the following guide to identify symptoms and solve problems. Make sure the vehicle's electrical system is working properly and power is reaching the Kappa 255a (i.e., green LEDs on the top panel are on).

SYMPTOM	LIKELY CAUSE	SOLUTION
No audio	Low/No Remote Turn-On Voltage	Check connections; test turn-on voltage
	Speakers are not connected or are blown	Check wiring; use VOM/DVM to measure speaker coil impedance
Distorted audio	Input sensitivity is not set properly	See <i>Setting Input Sensitivity</i> on previous page
Audio lacks "punch"	Speakers are wired with wrong polarity	Check polarity of connections; refer to <i>Applications</i> (pages 3 and 4)

SYMPTOM	LIKELY CAUSE	SOLUTION
Audio cycles off and on; Amber protection LEDs (on top panel) are on	A protection circuit is turning the amplifier off and on	Verify the following—electrical system is between 10 ~ 15.5 Vdc; temperature is not over 194°F (90°C); no short circuits; speaker loads are not less than 1 ohm (2 ohms in mono)
Audio cycles off and on; Amber protection LEDs (on top panel) are on	GAIN is set too high	Set Input Sensitivity correctly (see previous page)
Fuse blows	Incorrect wiring or short circuit	Check connections; refer to <i>Applications</i> (see pages 3 and 4)

## SPECIFICATIONS

### KAPPA 255A...

Power Output, 4 ohms:	4 x 50 and 1 x 200 watts
Power Output, 2 ohms:	4 x 75 and 1 x 300 watts
Power Output, Bridged 4 ohms:	2 x 150 and 1 x 200 watts
Frequency Response:	20 Hz ~ 20 kHz
Input Sensitivity:	250 mV ~ 9 V
THD + Noise (4 ohms):	0.05 %
Signal-to-Noise:	> 95 dB
Maximum Current Draw:	80 A
Dimensions (w x h x l):	23 x 2 <sup>3/16</sup> x 8 <sup>1/2</sup> in. 584.2 x 55.6 x 215.9 mm

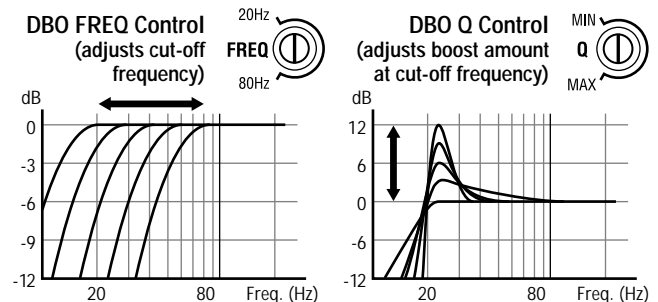


Figure 8. Frequency response curves show range of Kappa 255a DBO controls.



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