DIAMOND

# HEX SERIES
## AMPLIFIERS

MONOBLOCKS
HX800.1D/HX1200.1D/HX1600.1D


# Owners Manual

## ABOUT THE DIAMOND AUDIO EXPERIENCE

Congratulations, you have just purchased one of the finest mobile audio products on the market. Diamond Audio products represent the latest advances in electronical and acoustical technologies in sound reproduction for your vehicle. Diamond Audio products are designed, developed, and engineered in the USA using the latest innovative materials and components to provide the finest sound reproduction possible. Every Diamond Audio product has been verified and tested to ensure the best sounding and most reliable product on the market, if installed properly. Diamond Audio products will provide many years of the ultimate listening experience.

Please note that prolonged exposure to sound pressure levels in excess of 100dB can cause permanent hearing loss. Using Diamond Audio products can exceed that level so please exercise restraint in its operation in order to preserve your ability to enjoy its high fidelity sound for many years to come.

Diamond Audio recommends our products be professionally installed by an authorized Diamond Audio dealer to achieve the best possible system recommendation and installation. This will ensure a true Diamond Audio listening experience and sound you would expect from Diamond Audio products. With proper validation, using a Diamond Audio Retailer for installation, your newly purchased amplifier, Diamond Audio will extend the product warranty from one year to Two Years!!

Go ahead, Hear the Music

## FEATURES

- Anodized Extruded Aluminum Heat Sink Provides Superior Thermal Performance
- 4-Layer PCB Board with Balanced Differential Inputs
- Full Range Class D IR Chipset
- “SNAP” Capacitors used Throughout the Circuit
- Audiophile Grade High Tolerance Components
- Spring Steel FET Clips Provide a Cleaner Board Design
- Illuminated Logo / Fully Concealed Mounting
- Output Clip Indicators for Precise Set Up
- Fine Tuned Fully Variable Crossovers and Phase Control
- Top Mounted Controls for Convenient Amplifier Adjustment

## POWER RATINGS

| | HX800.1D | HX1200.1D | HX1600.1D |
|---|---|---|---|
| | 800 W RMS | 1200 W RMS | 1600 W RMS |
| RMS Power (4 Ω) | 340 W RMS | 540 W RMS | 700 W RMS |
| RMS Power (2 Ω) | 560 W RMS | 870 W RMS | 1050 W RMS |
| RMS Power (1 Ω) | 800 W RMS | 1200 W RMS | 1600 W RMS |

WARNING: Prolonged exposure to sound pressure levels in excess of 100dB can cause permanent hearing loss. Diamond Audio amplifiers can exceed that level so please exercise restraint when listening and enjoying your new amplifier.

## GENERAL PRECAUTIONS

- This unit is designed for negative ground 12V DC operation only.
- Total system impedance must not be less than1 ohm mono.
- Avoid installing the unit where:
  - It would be subject to high temperatures, such as from direct sunlight or hot air from the heater.
  - It would be exposed to rain or moisture.
  - It would be subject to dust or dirt.
- Do not cover the unit with carpet or wires.
- Do not use the unit with a weak auto battery. Optimum performance depends on a normal battery supply voltage.
- For safety reasons, keep the volume of your car audio system moderate while driving your vehicle so that you can still hear normal traffic sounds outside your car.
- There is NO speaker level input connector, you can cut RCA's and solder the wires and connect directly thru low level input(RCA)

## MOUNTING PRECAUTIONS

Although Diamond Audio amplifiers incorporate heat sinks and protection circuits, mounting the amplifier in a tight space without any air movement can still damage internal circuitry over time. Choose a location that provides adequate ventilation around the amplifier. For easy system set-up, mount the amplifier so the side panel controls will be accessible after installation. To increase thermal run times on low impedance loads, an additional fan is recommended, remember any moving air across the amplifier will reduce heat.
In addition, observe the following precautions:

1. Using a felt pen mark the mounting hole locations.
2. Mounting the amplifier on carpet will significantly reduce air flow, resulting in reduced thermal run times.
3. Mount the amplifier on a solid surface. Avoid mounting to sub woofer enclosures or areas prone to vibration. Do not install the amplifier on plastic or other combustible materials.
4. Prior to mounting the amplifier, make sure not to cut or drill into the fuel tank, fuel lines, brake lines (under chassis) or electrical wiring.

## WIRING PRECAUTIONS

1. Before installation, make sure the source unit power switch is in the OFF position.
2. Disconnect the negative (-) lead of the battery before making any power connections.
3. When making connections, be sure that each one is clean and secure. Insulate all of your connections. Failure to do so may damage your equipment.
4. A secure clean ground connection is critical to the performance of your amplifier. Connect the ground directly to the car chassis to minimize resistance and avoid any noise problems.
5. Add an external fuse on the amplifier's positive (+) power lead and connect it as close as possible to the vehicle's (+) battery terminal. Use a rating that equals the total current consumption at full output of all amplifiers in the system. This external fuse will protect the vehicle from short circuits that can cause a fire.

## VEHICLE ELECTRICAL SYSTEM

Amplifiers (regardless of brand name) will put a load on the vehicles battery and charging system. Diamond Audio recommends checking your alternator and battery condition prior to installation to ensure that the electrical system has enough capacity to handle the increased load of your stereo system. Original equipment electrical systems, which are in good conditions, should be able to handle the extra load of any Diamond Audio amplifier without problems, althouigh battery and altrernaor life can be reduced depending on your individual listening habits. To maximize the performance of your amplifier, we suggest the use of a power stiffening capacitor (1 Farad per 1,000W)

## WARNING:

Avoid running power wires near the low level input cables, antenna, power leads, sensitive equipment or harnesses. The power wires carry substantial current and could radiate noise into the audio system through the audio cables.

1. Plan the wire routing as described in the "Importance of Pre-Planning" section. Keep RCA cables close together but isolated from the amplifier's power cables and any high power auto accessories, especially electric motors. This is done to prevent coupling the noise from radiated electrical fields into the audio signal. When feeding the wires through the firewall or any metal barrier, protect them with plastic or rubber grommets to prevent short circuits. Leave the wires long at this point to adjust for a precise fit at a later time.

2. Prepare the power wire for attachment to the amplifier by stripping 5/8 inch (15.9mm) of insulation from the end of the wire. Insert the bare wire into the B+ terminal And tighten the set screw to secure the cable in place.

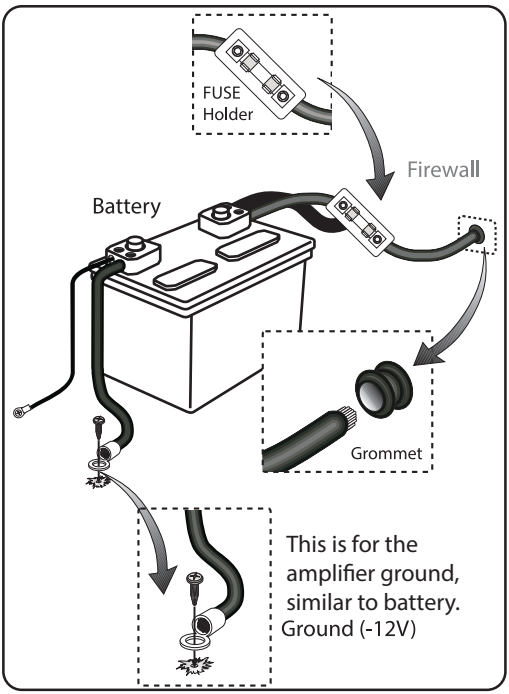
## WARNING:

The B+ cable MUST be fused 18" or less from the vehicle's positive battery post. Choose a location to install a waterproof fuseholder under the hood and ensure connections are water tight. If you do not use the appropriate fuseholder, the connection will eventually suffer corrosion from moisture and heat.

3. Trim the power cable within 18 inches (457mm) of the positive battery post and splice in a in-line fuse holder. DO NOT install the fuse at this time.

4. Strip 1/2 inch (12.7mm) from the battery end of the power cable. Crimp and soldier a large ring terminal to the cable. Connect the ring terminal to the positive (+) battery post

## FUSE WIRE DIAGRAM

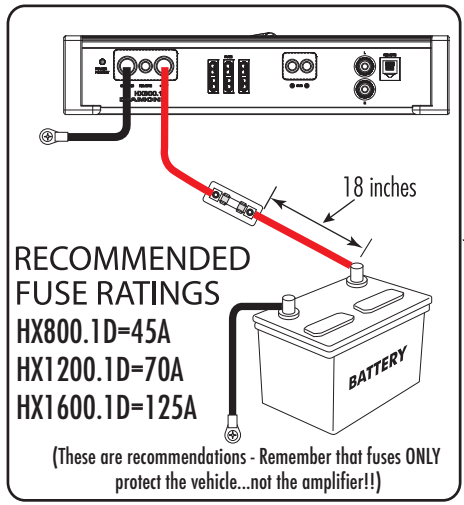


5. Prepare the ground wire for attachment to the amplifier by stripping 5/8" of insulation from the end of the wire. Always use a wire of the same gauge as the power connection, never smaller. Insert the bare wire into the GND terminal and tighten the set screw to secure the cable in place. Prepare the chassis ground by scraping any paint from the metal surface and thoroughly clean the area of all dirt and grease. Strip the other end of the wire, crimp and soldier a ring connector. Fasten the cable to the chassis using a non-anodized screw with a star washer and a nut.

WARNING: It is important to upgrade the ground connection between the negative (-) battery post and the vehicle body or chassis to achieve optimum electrical performance.

6. Prepare the REM turn-on wire for attachment to the amplifier by stripping 5/8 inch (15.9mm) of insulation from the end of the wire. Insert the bare wire into the REM terminal and tighten the set screw to secure the wire in place. Connect the other end of the REM wire to a switched 12 volt positive source. The switched voltage is usually taken from the source unit's remote amp turn on lead. If the source unit does not have this output available, the recommended solution is to wire to an accessory terminal in the car's fuse block using a relay to isolate the amplifer from the vehicles accessory circuit. This however will turn the amplifier on and off with the ignition key, regardless of whether the car stereo is on or off.

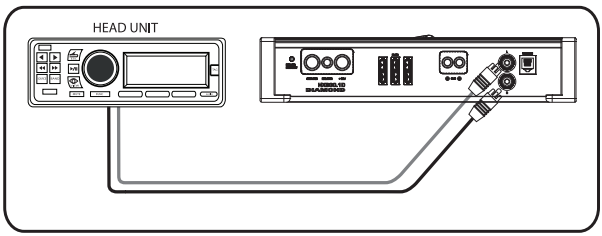
## FUSE CONNECTION DIAGRAM




7. Securely mount the amplifier to the vehicle or amp rack. Be careful not to mount the amplifier on cardboard or plastic panels. Doing so may enable the screws to pull out from the panel due to road vibration or sudden vehicle stops.

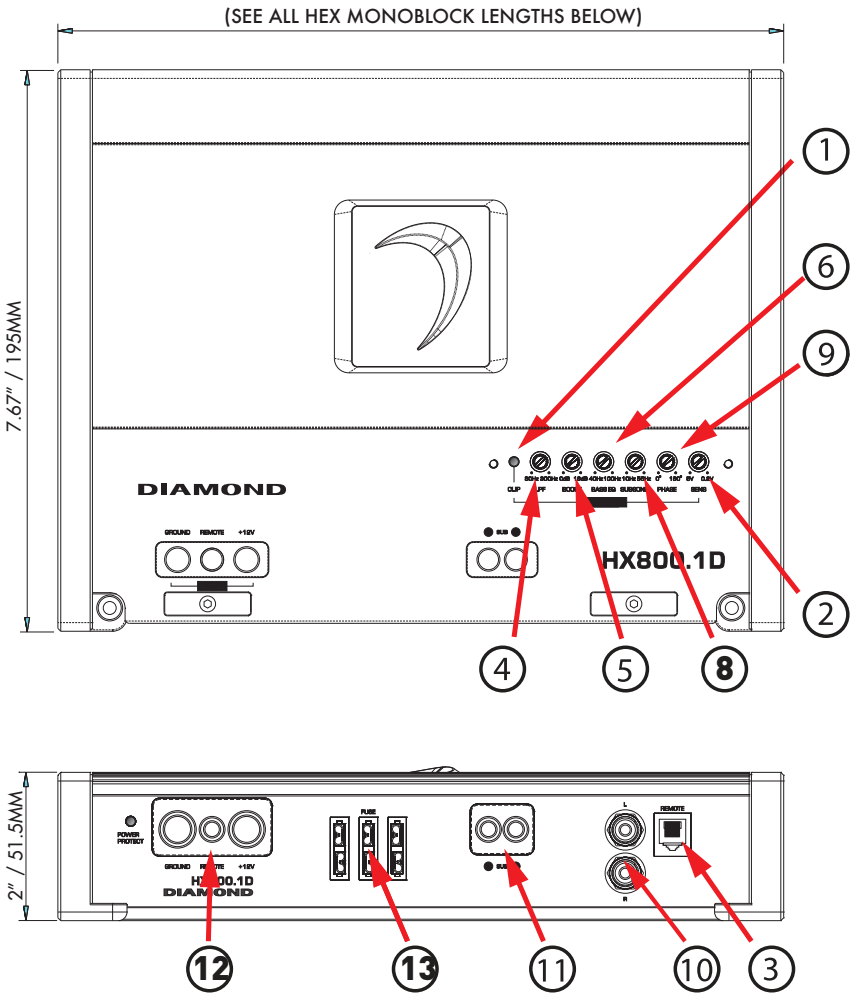
8. Connect from source signal by connecting the RCA audio cables to the input jacks at the amplifier.

## RCA CONNECTION DIAGRAM




9. Connect the car subwoofers. Subwoofer impedance should never be less than 1 Ohms bridged(the mono blocks are stable into 1ohms.) For most applications 14 gauge wire is adequate for the subwoofer (up to 10 guage for subwoofers). For leads in excess of ten feet, 12 gauge wire is recommended. Strip the speaker wires 1/2" (12.7mm) and insert into the speaker terminal block, then tighten the set screw to secure into place. When wiring the speakers, pay careful attention to the polarity of the terminals on the speakers and make certain they correspond to the polarity on the amplifier. DO NOT chassis ground any of the speaker leads as damage to the amplifier and/or speaker may result.

## DIAMOND HEX MONOBLOCKS
## ALL HAVE SAME FEATU RE SETS




## PHYSICAL DIMENSIONS OF HX800.1D/HX1200.1D/HX1600.1D

ALL HEX AMPLIFERS ARE 2.02" HIGH (51.5MM) X 7.7" DEEP (195MM)

HX800.1D WIDTH - 9.92" (252MM)/ HX1200.1D - 14.25" (363MM) / HX1600.1D -15.8" (402MM)

# FUNCTIONS/FEATURES

① **Power/OverLoad Protection System LED's** - These lights indicate when the amplifier is powered up normally and when there is a protection fault. The "OPS" LED is illuminated when there is a problem with your amplifier. Please contact your authorized Diamond Audio dealer or call our technical support.

② **Sensitivity Adjustment (Input Gain)** - This control matches the preamp stage of the Diamond Audio amplifier to your source unit. This is NOT a volume or power control! The range is between approximently 200mv (0.2V) and 5V

③ Clipping Indicator LED's - These lights indicate when the amplifier is "clipping" (going into distortion) This could be casued by over driving the input section and/or setting the input "gain" control to high. Remember that GAIN is NOT power output.

④ **LPF Crossover Adjustment** - Use this adjustment to select the crossover point. Remember that you must select the Low Pass position (LPF) of the Crossover Selection Switch first. The range of adjustment is limited between 30-300 Hz.

⑤ **Bass Boost** - This control adds 0 to +18dB of boost at whatever frequency you have elected to boost at (see Bass EQ below). Be careful as this adds boost , which increases power, which increase current draw. This can be considerable when using multiple Mono Blocks. BE CAREFUL!!

⑥ **Bass EQ** - This control adjusts the frequency at which the Bass Boost is used at (see above). Adjust this by ear to your taste and subwoofer /enclosure tuning frequency.

⑦ **Remote Level Control** - HX800.1D/HX1200.1D/HX1600.1D amplifiers have this port for the remote level control (included). The control is intended to allow the user to control the level of gain up to the maximum adjustment level set on the amplifier. The control does not add additional boost, it only attenuates the setting that is fixed at the amplifier's control panel.

⑧ Sub-Sonic Adjustment - This control allows you to remove the unwanted sub-sonic frequencies below the tuning frequency of a ported enclosure. This helps to protect the woofer from over excursion.

⑨ **Variable Phase** - This control gives the installer a unique feature that allows the variable adjusment of phase 0-180 degrees to compensate for subwoofer placement. Allowing the subwoofer to sound like it's placed in the front of the vehicle instead of the trunk.

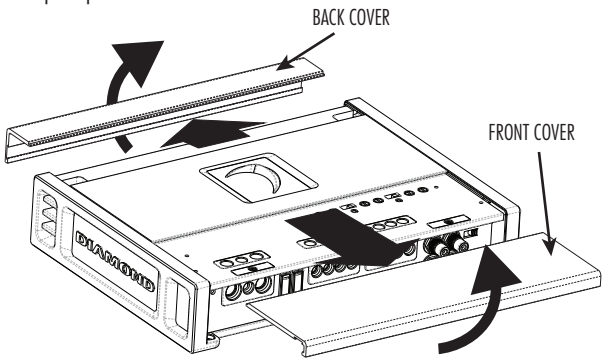
⑩ Line Input(RCA) - The RCA jacks allow for a normal Left and Right channel signal input. Simply connect to the source unit using RCA type audio cables, keeping them away from power wiring wherever possible to reduce risk of noise.

⑪ **Speaker Output Terminals** - Connect your subwoofers to these terminal. Make sure to connect Positive to Positive (+ to +) and Negative to Negative (- to -). All Diamond Audio HEX mono blocks are stable into 1 ohm loads, NOT 1/2 ohm!!!

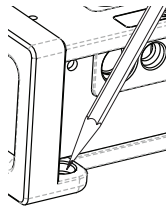
⑫ Power Input Connections - These connections are for input power, chassis ground, and remote turn-on. Use a minimum of 8 gauge wiring for power and ground connections. 4 Guage is recommended for the mono block. The terminals will handle up to 4 gauge wiring with no problem whatsoever. Be sure any wiring that passes through metal has a grommet!

⑬ Power Fuses - Standard automotive type ATC/ATO fuses are used on Diamond Audio amplifiers. Always replace with the correct fuse size. Never insert fuses of higher values. Doing so will void the warranty of your Diamond Audio amplifier. Also include a main fuse at the connection to the vehicle battery within18 inches of the positive battery post. It is also important to upgrade the connection between the negative battery post and the chassis of the vehicle. This greatly reduces possibilities of weak electrical "links" in the circuit.

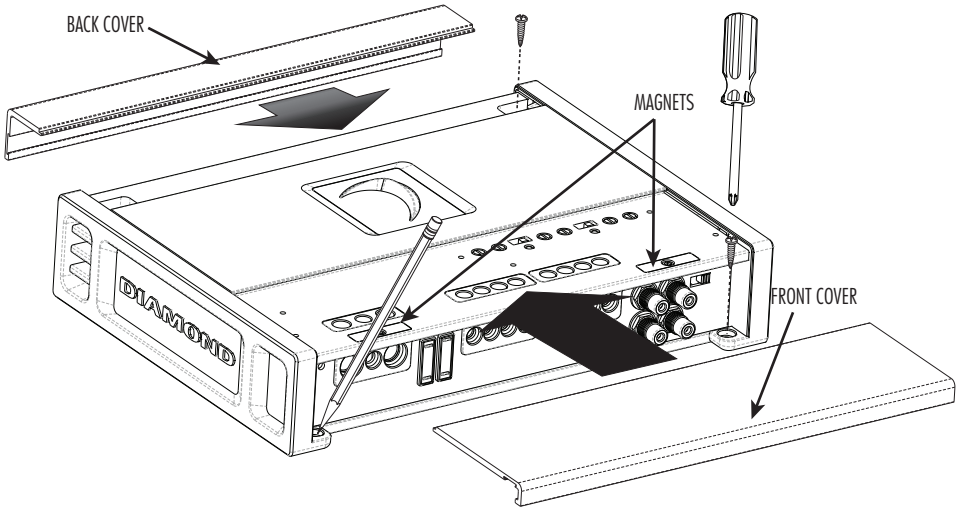
All Diamond Audio HEX amplifiers are designed with hidden mounting. To accomplish this the front and rear alumimum covers are magnetically attached for easy access. To start the installation/mounting process simply remove the back panel by pushing towards the rear and pulling up at the same time. The front process is similar but push/pull towards the front and pull up as shown below.




Mark Amplifier Mounting Holes:
Once the covers are removed, use a pencil and mark the mounting locations. Both front and rear. Once marked, drill 1/8" holes for the included mounting screws. (see below)



Once the amplifier(s) is mounted input signal cables and speaker/power wires are connected, adjust the input levels and crossover settings (according to page 9) After all the settings are done, THEN put the front and rear cosmetic covers back on. As shown below.




NOTE: These covers are both a friction fit as well as magnetic. There is a small "lip" on the front cover that clamps the front cover on tightly. Sometimes it can be somewhat hard to remove. Be careful, but forceful.

SInce these are subwoofer amplifers (MonoBlocks) the LPF (low Pass Filter) is always on in the Low Pass Filter mode, enabling frequencies below the cutoff point to pass. For a subwoofer system begin tuning with the frequency set between 80Hz and 120Hz. To adjust the gain setting, set the LPF to an aubitrary frequency, 80Hz is a good start.turn the amplifier gains all the way down (counterclockwise).

If using a remote level control (All Diamond Audio HEX MonoBlocks come with it), plug the level control into the amplifier and turn it to the "MAX" position. Next turn the source unit(headunit) volume up to almost full volume (usually about 2/3rds of the way up) or until the output starts to distort on an oscilloscope(or audible subwoofer distress for those without a scope). This will be NEARLY full volume on most source units, perhaps one or two "clicks" down from maximum volume. Next, increase the amplifier gain setting until adequate volume is achieved, or until distortion is audible and then turn it down a bit until the distortion is inaudible.

NOTE:
Ideal signal to noise and dynamic range are achieved with the gain at minimum. Most users find adequate gain and volume is achieved at less than halfway in the adjustment range. Avoid setting the amplifier gain very high as noise and distortion will increase significantly. REMEMBER that GAIN is gain, NOT power. There is NO "1/2 gain", or "3/4 gain"!!! For a more in depth level setting (gain adjustment) procedure, visit the Diamond Audio website.

The LPF crossover adjustment can now be fine tuned. Depending on vehicle, system configuration and taste there are thousands of possibilities. There is NO wrong frequency. It is up to your taste. But generally a lower crossover frequency (below 60Hz) will give you a tighter sound and crossing over higher (above 70 Hz) will be more robust, tubbier sounding. To each their own!!!
After setting the input gain adjustment and crossover, you may choose to add a small amount of "Bass Boost" in the low frequency region. Remember that the Bass Boost/EQ filter feature will not fix a poorly designed subwoofer enclosure or subwoofers that didn't sound good to begin with.

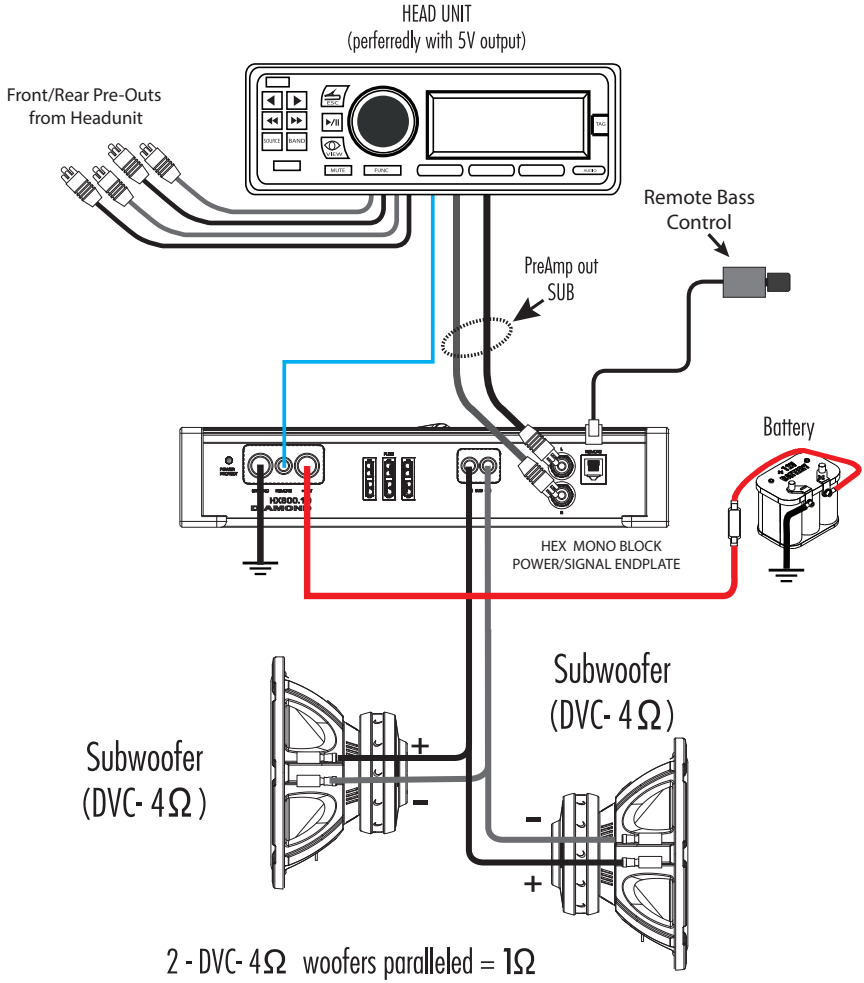
1. Make sure any bass EQ or low frequency equalization from the source unit is set to OFF or FLAT.

2. While playing the same musical selections used during the gain setting process, slowly increase the level of the Bass EQ. You should be able to notice a obvious change between 0 and +18dB, especially if you have set the EQ below 50Hz. If you do not notice much difference, then it will not serve any benefit to increase the boost further.

3. If the boost has audible benefits without adding appreciable distortion, find a level that suits your taste. Remember: it's much easier to construct the right subwoofer enclosure for your listening preferences than relying on a bass boost control to do the job!

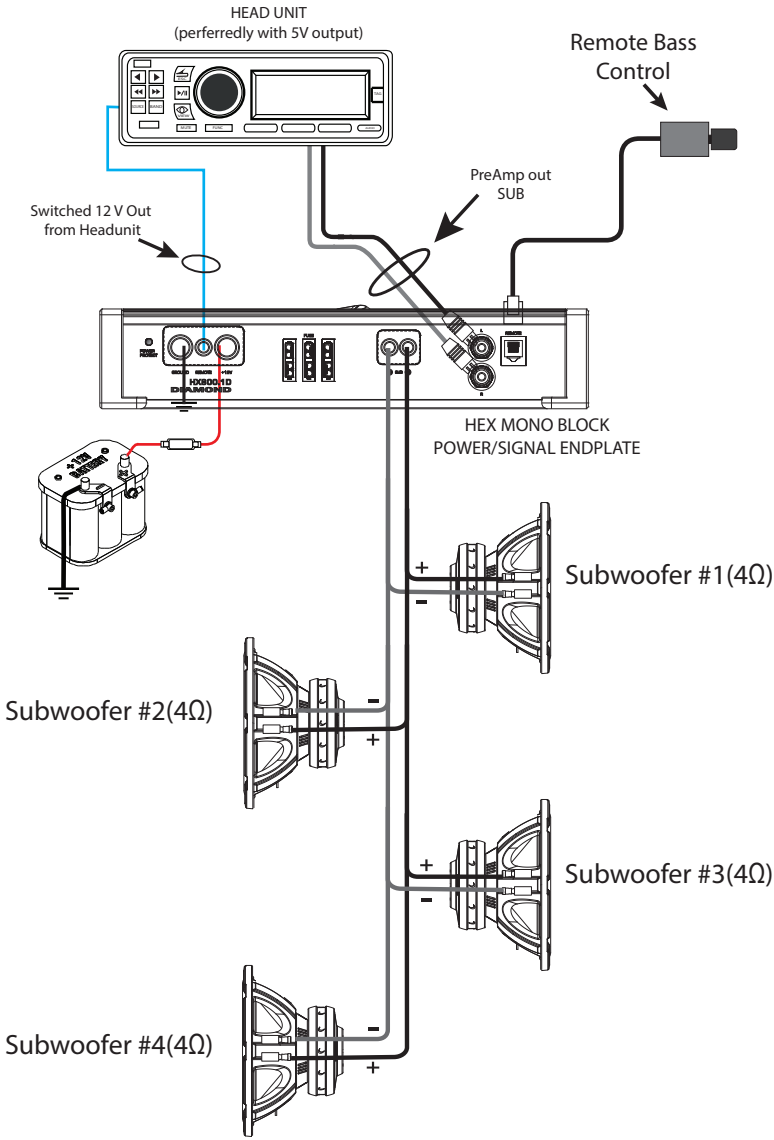
4. Adjust Variable Phase with someone turning that control knob while you listen in the driver's position of the vehicle. Play some music with vocals AND Bass. While turning the Variable Phase knob listen to the bass "move". You want it in the front of the car (as much as possible) and the most bass. That will be the correct position for that control.

## DIAMOND HEX MONOBLOCK
## 1 - Amplifier, 2 Subwoofers (1 Ω)




2 - DVC- 4Ω woofers paralleled = 1Ω

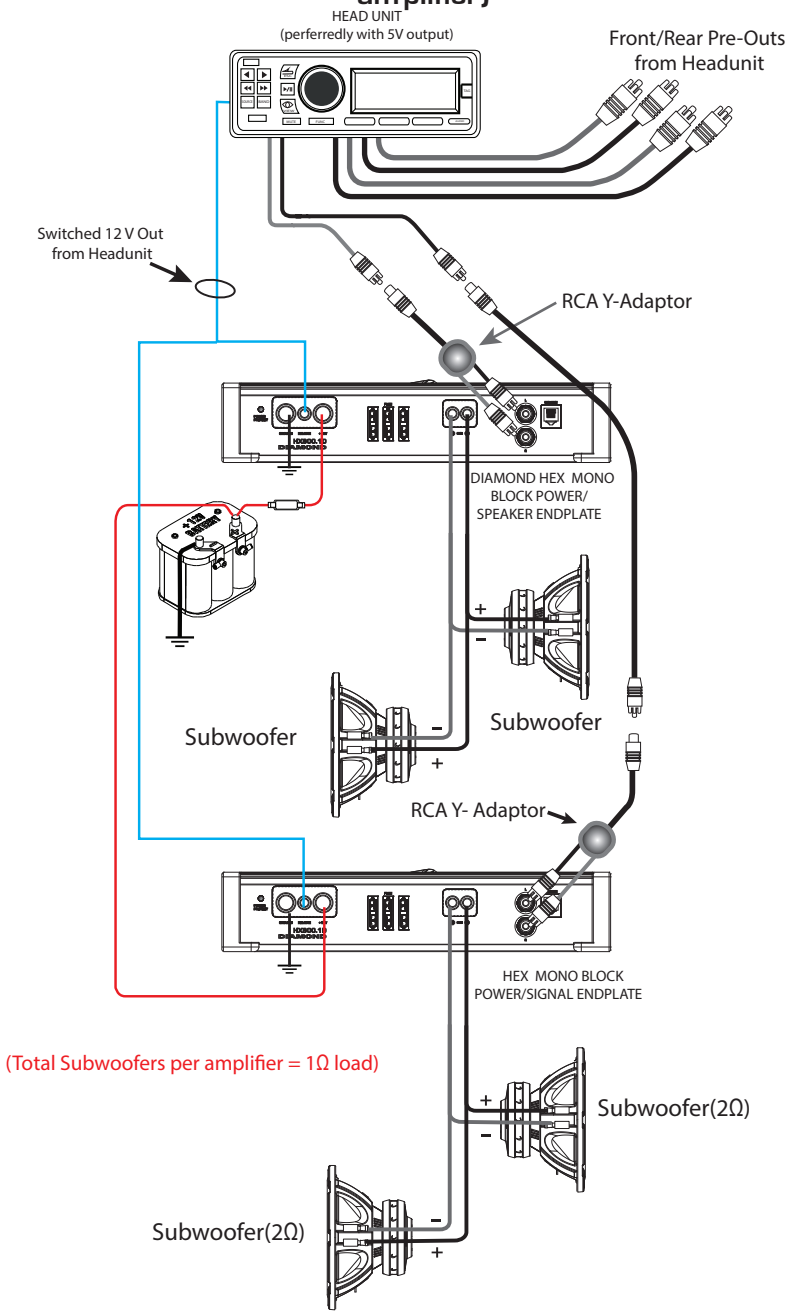
# DIAMOND HEX MONOBLOCK
## 1 - Amplifier / 4 - Subwoofer (1 Ω )



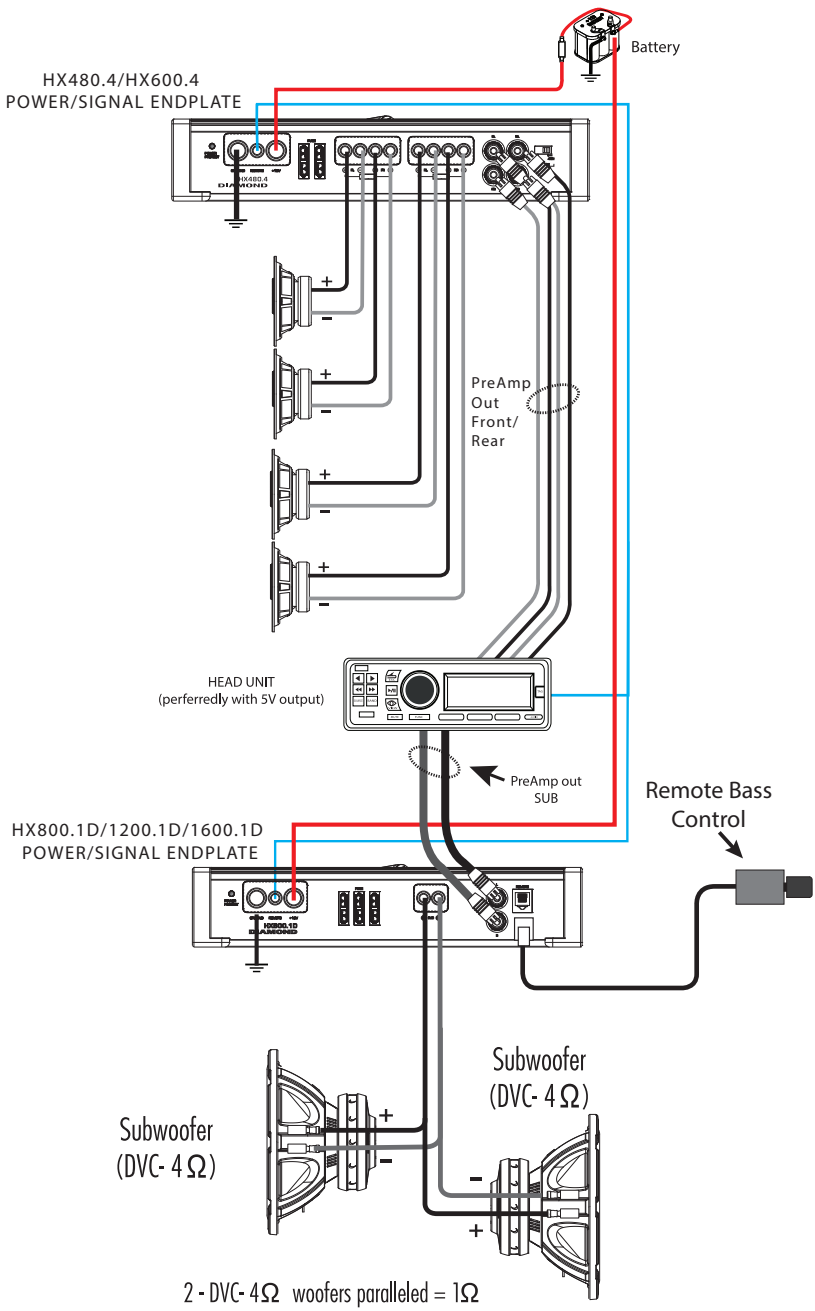

(Total Subwoofers per amplifier = 1Ω load)

## DIAMOND HEX MONOBLOCK

### 2 Amplifiers / 4 - Subwoofer (1 Ω per amplifier)



## DIAMOND HEX COMPLETE 5-CHANNEL SYSTEM
## HX480.4/HX600.4 (4-CH) & HX800.1D/1200.1D/1600.1D (1-CH)



# PRODUCT SPECIFICATIONS

| RMS Power Rating | HX800.1D | HX1200.1D | HX1600.1D |
|---|---|---|---|
| RMS Power (4 Ω) | 340 W RMS | 540 W RMS | 700 W RMS |
| RMS Power (2 Ω) | 560 W RMS | 870 W RMS | 1150 W RMS |
| RMS Power (1 Ω) | 800 W RMS | 1200 W RMS | 1600 W RMS |
| Type | | | |
| Topology | Class D | Class D | Class D |
| Power Supply | | | |
| Power Supply | Full PWM | Full PWM | Full PWM |
| Power Supply Threshold | 10.0VDC - 17.0VDC | 10.0VDC - 17.0VDC | 10.0VDC - 17.0VDC |
| Idle Current | (0.7A) | (0.7A) | (0.7A) |
| Distortion | | | |
| THD 4 (1KHz @4Ω) | 0.1% | 0.1% | 0.1% |
| S/N Ratio (A weighted @1W) | -80dBA | -80dBA | -80dBA |
| S/N Ratio (A weighted @ FP) | -95dBA | -95dBA | -95dBA |
| Input Sensitivity | | | |
| Low Input Level | 200mV - 5.0V | 200mV - 5.0V | 200mV - 5.0V |
| High Input Level | N/A | N/A | N/A |
| Input Impedance | | | |
| Low Input Level | 20 KΩ | 20 KΩ | 20 KΩ |
| High Input Level | N/A | N/A | N/A |
| Output Stage | | | |
| Output Impedance | 0.011 Ω | 0.0297 Ω | 0.018 Ω |
| Damping Factor (50Hz @ 4Ω) | >250 | >250 | >250 |
| Bandwidth (-3dB) | 10Hz-300Hz | 10Hz-300Hz | 10Hz-300Hz |
| Crossover (-12 dB/Oct) | | | |
| Variable High-Pass | N/A | N/A | N/A |
| Variable Low-Pass | 30Hz-300Hz | 30Hz-300Hz | 30Hz-300Hz |
| Variable Sub-Sonic | 10Hz-55Hz@12dB | 10Hz-55Hz@12dB | 10Hz-55Hz@12dB |
| Fuse Ratings | | | |
| ATC | 30A X 3 | 30A X 4 | 40A X 4 |
| Dimensions | | | |
| L x W x H (inches) | 9.9" x 7.67" x 2" | 14.25" x 7.67" x 2" | 15.8" x 7.67" x 2" |
| L x W x H (mm) | 252 x 195 x 51.5 | 363 x 195 x 51.5 | 402 x 195 x 51.5 |

## LIMITED WARRANTY STATEMENT

Diamond Audio Technologies (DAT), a division of CV & DA Holdings Incorporated, warrants this product to be free from defects in material and workmanship for a period of one (1) year from the original date of purchase, provided it was purchased from an authorized DAT retailer within the United States. Product warranty period starts at the date of purchase or one year past the manufacture date whichever is first. However, upon purchase and completion of the on-line registration and installation by an authorized DAT dealer you warranty period will be extended to two (2) years. This warranty extension offer will only be recognized upon completion of the on-line registration of your product within thirty (30) days of the date of purchase.

THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER OF THIS PRODUCT IN ITS ORIGINAL INSTALLATION. Original purchaser must reside in the United States and be able to provide proof of purchase and installation with the sales receipt and completion of online regoistration from the authorized DAT retailer that sold and installed the product.

Should a manufacturing defect occur during above said warranty period, DAT will replace or repair the defective product with a product of the same or equivalent value and performance, at DAT's discretion.

Damage or failure caused by any of the following is not covered under this warranty policy: negligence, improper use, abuse, product modification, unauthorized repair attempts, accident, acts of God, misrepresentations by DAT retailers, and improper/inadequate packaging during return shipping.

**Warranty is void if serial numbers have been removed, altered or defaced.**

## HOW TO OBTAIN WARRANTY SERVICE

In the event a DAT product should require service, you should visit the authorized DAT retailer you purchased the product from and they can expedite your claim. All claims must fall into the guidelines listed above and be accompanied by a copy of the original sales and installation receipt from that authorized DAT retailer.

Product returned for warranty service must be freight-prepaid, properly packaged and clearly marked with the Return Authorization (RA) number issued by DAT. Any product returned to DAT that is improperly packaged, does not have a RA number clearly marked on the package, or never received a RA number may be refused upon delivery. DAT does not assume responsibility for lost or misdirected product.

Repair or replacement under this warranty is the exclusive remedy of the consumer. DAT shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty on this product. Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights that may vary from state to state.

Customers outside the United States should contact their local sales office to obtain information on pricing, exchange unit availability, instructions, service and warranty/non-warranty replacement or repair.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