

OWNER'S
MANUAL

Directed **AUDIO**[®]

models | *D600*
D800
D1200
D2400

CONGRATULATIONS

Congratulations for choosing a Directed Audio power amplifier from Directed Electronics, the industry leader in high quality automotive security and audio equipment since 1990.

Directed Audio power amplifiers continue to set new standards of performance, reliability, and affordability in the mobile electronics industry.

Featuring high-efficiency MOSFET power supplies, flexible on-board crossovers, and state of the art audio design, Directed Audio power amplifiers will excite and delight the mobile sound

enthusiast with years of high-quality audio reproduction.

Directed Audio power amplifiers come with a two-year limited warranty if installed by an authorized Directed dealer. If not installed by an authorized dealer, Directed Audio power amplifiers are covered by a one-year, parts-and-labor limited warranty.

Be sure to retain your original sales receipt and refer to the warranty section of this guide for full details about your coverage.

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LIMITED TWO-YEAR CONSUMER WARRANTY

Directed Electronics, Inc. promises to the original purchaser, to replace this product should it prove to be defective in workmanship or material under normal use, for a period of two years from the date of purchase by the dealer as indicated by the date code marking of the product **PROVIDED** the product was installed by an authorized Directed dealer. During this two-year period, there will be no charge for this replacement **PROVIDED** the unit is returned to Directed, shipping pre-paid. If the unit is installed by anyone other than an authorized Directed dealer, the warranty period will be one year from the date of purchase by the dealer as indicated by the date code marking of the product. During this one-year period there will be no charge for this replacement **PROVIDED** the unit is returned to Directed, shipping pre-paid. This warranty is non-transferable and does not apply to any unit that has been modified or used in a manner contrary to its intended purpose, and does not cover damage to the unit caused by installation or removal of the unit. This warranty is void if the product has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in materials or construction. **ALL WARRANTIES INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY, WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND**

WARRANTY OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY ARE EXPRESSLY EXCLUDED TO THE MAXIMUM EXTENT ALLOWED BY LAW, AND DIRECTED NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCT. DIRECTED HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS. Unit must be returned to Directed, postage pre-paid, with: consumer's name, telephone number, and address, authorized dealer's name and address, and product description. **IN ORDER FOR THIS WARRANTY TO BE VALID, YOUR UNIT MUST BE SHIPPED WITH PROOF OF INSTALLATION BY AN AUTHORIZED DIRECTED DEALER. ALL UNITS RECEIVED BY DIRECTED FOR WARRANTY REPAIR WITHOUT PROOF OF DIRECTED DEALER INSTALLATION WILL BE COVERED BY THE LIMITED ONE-YEAR PARTS AND LABOR WARRANTY.** **Note:** This warranty does not cover labor costs for the removal and reinstallation of the unit. **BY PURCHASING THIS PRODUCT, THE CONSUMER AGREES AND CONSENTS THAT ALL DISPUTES BETWEEN THE CONSUMER AND Directed SHALL BE RESOLVED IN ACCORDANCE WITH CALIFORNIA LAWS IN SAN DIEGO COUNTY, CALIFORNIA.**

FEATURES

- Super-efficient Class D PWM design runs much cooler than conventional amps.
- High-speed MOSFET switching power supply.
- High-current complimentary Class D MOSFET outputs stable into one ohm loads. (D600 stable into two ohm load.)
- Thermal, DC offset, reverse polarity, and short circuit protection with status LED.
- Master/slave function supports two amps bridged to one load (D1200, D2400).
- Continuously variable 12dB/octave low-pass crossover.
- Switchable subsonic filter, 24dB/octave .
- Switchable 8 dB bass EQ function.
- Switchable 180° phase inversion.
- Remote subwoofer level control function.
- Variable input sensitivity optimizes match with different signal sources.
- Chrome-plated wire terminals and RCA connectors ensure maximum signal transfer.
- Rugged 2-piece heatsink and cover.
- Unity gain pass-through RCA jacks.

WARNING



High-powered car audio systems may produce sound pressure levels that exceed the threshold at which hearing loss may result.

They may also impair a driver's ability to hear traffic sounds or emergency vehicles. Use common sense and practice safe listening habits when listening to or adjusting your audio system.

INSTALLATION GUIDELINES

1. Please read this owner's manual carefully before installing this amplifier.
2. Disconnect the battery ground terminal prior to making any electrical connections.
3. Check for any hazards or obstructions such as gas tanks, fuel or brake lines, and wiring harnesses before mounting the amplifier.
4. Pick a mounting location that will provide adequate access and ventilation and protect the amplifier from heat, moisture, and dirt.
5. Avoid sharp metal areas when routing cables to the amplifier, and run RCA cables away from the power cables and other potentially noisy car harnesses.
6. The amplifier should be grounded with a short, heavy gauge wire connected directly to the car at a bare metal surface, preferably scraped body sheet metal. Do not use factory ground locations, seat bolts, or brackets that are spot welded.
7. Always fuse your power connection within 8 to 10 inches of the battery terminal. Use a fuse or circuit breaker rated slightly more than the on-board fuse(s) of the amplifier(s). The gauge of power wire used should take into account the total current draw of the system, and the length of wire used. IASCA and other auto sound competition organizations have charts available for this; you can also find a chart in the MECP study guide. Minimum wire gauge recommendations for the individual amplifiers are listed on the specification page. Always use the same gauge wire for the amplifier ground that you use for the power wire. Be sure to examine the battery ground cable of the vehicle, and if necessary, upgrade it by adding an additional ground wire that is the same gauge as the amplifier's power wire. Remember, the amplifier can only deliver its rated output when it is not current limited by the power and ground supply wires.
8. This amplifier is designed to drive a speaker load that measures from 1 to 4 ohms (D600 2 to 4 ohms). Keep in mind that heat is the long-term enemy of automotive elec-

tronics and the lower your speaker load, the more heat is generated. For low impedance speaker applications or restricted ventilation installations, an external cooling fan may be advisable.

9. Battery and ground connections to the vehicle should be made with crimped ring terminals of the appropriate size (surface area is what counts); soldering the terminals after crimping is also recommended.
10. Due to the high-frequency MOSFET switching power supply, filtering the power cable is not generally required (remember that the amp can't deliver full output if the power supply is restricted). Proper grounding of the signal source is mandatory for the amplifier to reach its performance peak. If the RCA inputs are not grounded adequately via the signal source, electrical noise from the vehicle may be picked up in the system.

FRONT PANEL CONNECTIONS/CONTROLS

1. **RCA Input Jacks** - Accepts line level outputs from head units or signal processors at voltages between 150mV and 7.5 volts.
2. **RCA Line Output Jacks** - These pass through RCA jacks can be used to send the input signal to a second amplifier.
3. **Slave/Master Switch (D1200/D2400 only)** - Controls whether the amplifier is a slave or master when connected in combined amplifier configurations. (Refer to the *Combined Amplifiers* section of this guide.)
4. **Gain Control** - Controls the amplifier's sensitivity and is used to match the input level of the amplifier to the output level of the signal source.
5. **Subsonic Switch** - The subsonic filter attenuates frequencies below 30Hz by 24dB per octave.
6. **Bass EQ Switch** - Adds 8dB of bass boost to the subwoofer when selected.
7. **Remote** - Controls the subwoofer amplifier gain, from a remote location for ease of adjustment during listening.

Warning: DO NOT connect a level control knob from other manufacturers to the Remote Sub Level Control of any Directed amplifier. Even though the connectors fit properly, the control knob and connector pin positions may be different and the amplifier will be damaged.

8. **LPF Control** - Controls low pass filter cutoff from 30Hz to 250Hz.
9. **Phase Switch** - 0° or 180° selectable for switching the phase output to the woofer.
10. **LED/FAN Connector** - Allows connection of an **optional** LED light bar or **optional** cooling fan for the amplifier.
11. **Status LED** - Will illuminate GREEN to indicate the amplifier is on and operating normally, and will be illuminated RED if the amplifier shuts down due to short circuit, DC offset, or overheating detected by on-board protection circuitry.

FIGURE 1—AMPLIFIER CONNECTIONS/CONTROLS D600/D800 FRONT

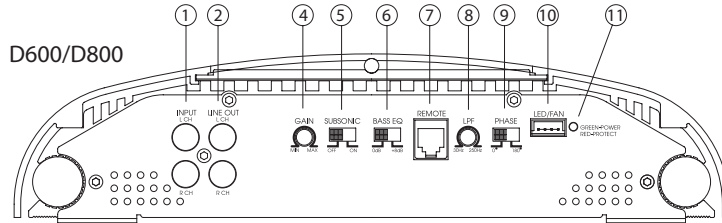


FIGURE 2—AMPLIFIER CONNECTIONS/CONTROLS D1200/D2400 FRONT

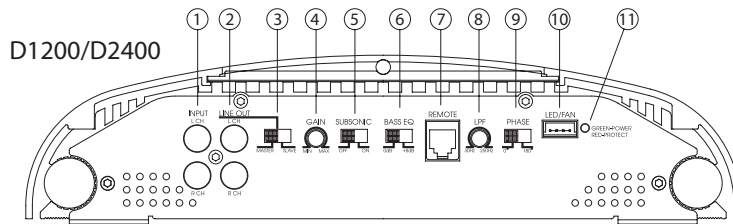
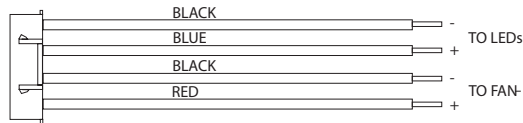


FIGURE 5—LED/FAN HARNESS

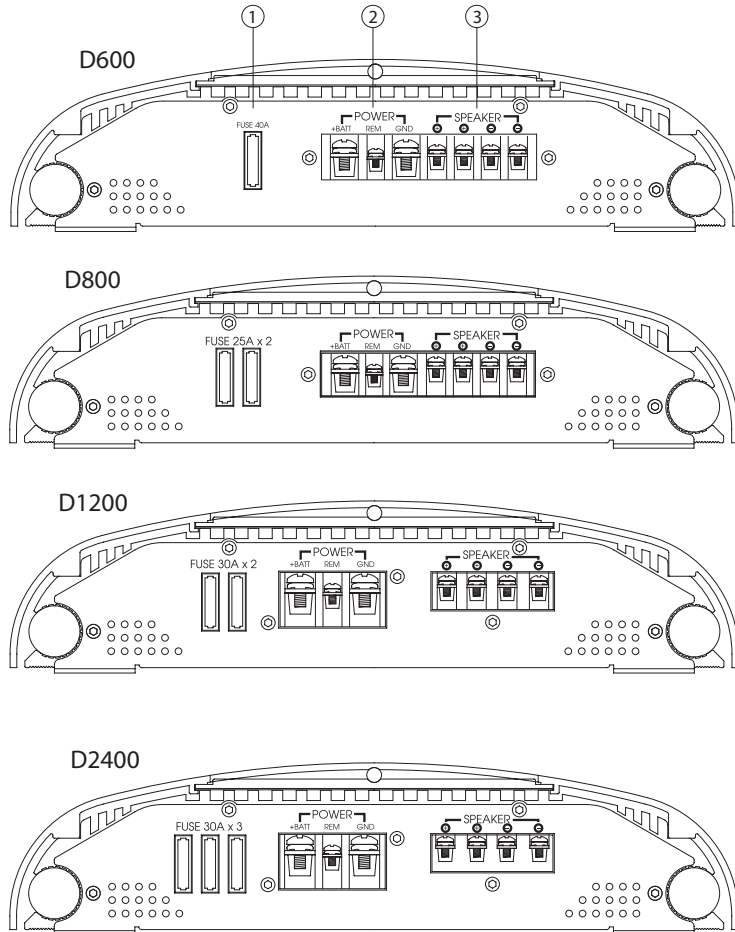


REAR PANEL CONNECTIONS

1. **Fuses** - These fuses protect the amplifier against internal electrical damage and are meant to protect the amplifier only. All other power connections should be fused at the source.

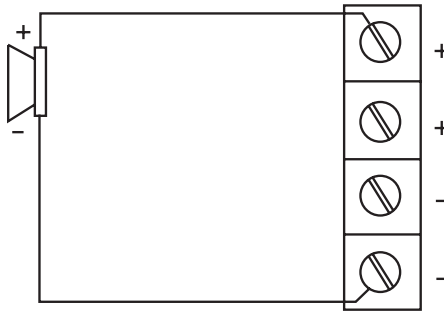
The D600 uses 1-40A fuse, the D800 uses 2-25A fuses, the D1200 uses 2-30A fuses, and the D2400 uses 3-30A fuses.
 2. **(+) 12 Volt Power** - Connect this terminal through a FUSE or CIRCUIT BREAKER to the positive terminal of the vehicle battery or the positive terminal of an isolated audio system battery.
- WARNING:** Always protect this power wire by installing a fuse or circuit breaker of the appropriate size within 12 inches of the battery terminal connection.
2. **Remote Turn On** - This terminal turns on the amplifier when (+) 12 volt is applied to it. Connect it to the remote turn on lead of the head unit or signal source.
 2. **Ground** - Connect this terminal directly to the sheet metal chassis of the vehicle, using the shortest wire necessary to make this connection. Always use wire of the same gauge or larger than the (+) 12 volt power wire. The chassis connection point should be scraped free of paint and dirt. Use only quality crimped and/or soldered connectors at both ends of this wire. DO NOT connect this terminal directly to the vehicle battery ground terminal or any other factory ground points.
 3. **Speaker Terminals** - Connect subwoofers to these terminals. (Refer to the *Speaker Wiring Diagrams* section of this guide.)

FIGURE 2—AMPLIFIER CONNECTIONS - REAR

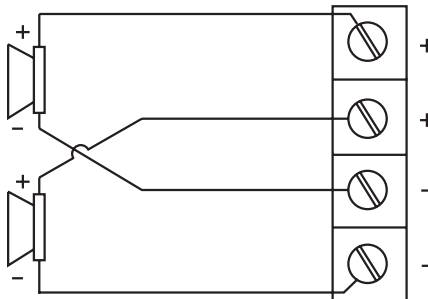


SPEAKER WIRING DIAGRAMS

Single subwoofer connection (top view)



Two subwoofer connection (top view)



NOTE: The dual + and - sub-out terminals of the D600/D800/D1200/D2400 are paralleled internally and the combined load impedance should be taken into consideration when connecting multiple subwoofers.

COMBINING AMPLIFIERS

The Directed D1200/D2400 subwoofer amplifiers have the capability of connecting two or more amplifiers of the same power rating together in a master/slave combination for increased power with accurate level matching. They are the Parallel Synced Gain and External Synced Bridged combinations.

WARNING: DO NOT attempt to combine amplifiers of different power ratings. These amplifier combinations work correctly only if the Master and Slave amplifiers are identical models.

Parallel Synced Gain

In this master/slave combination the master amplifier pre-amp controls remain active and the slave amplifier pre-amp is bypassed. This allows the master amplifier to control gain, filter, and sub-level on both amplifiers.

This combination allows the amplifiers to drive their own separate subwoofer(s) while being synced together via an in-phase audio pre-amp signal from the master amplifier. Wiring connections to the amplifier subwoofer outputs in this combination should be standard in-phase configurations, creating a parallel speaker connection. (Refer to *Parallel Synced Gain* section of this guide for amplifier and speaker connection diagrams.)

NOTE: One master amplifier can control up to three slave amplifiers in this combination. Multiple identical master/slave combinations can be added to any given system.

External Synced Bridged

In this master/slave combination the master amplifier pre-amp controls remain active and the slave amplifier pre-amp is bypassed. This allows the master amplifier to control gain, filter, and sub-level on both amplifiers. This combination allows the amplifiers to drive common subwoofer loads while being synced together via an out-of-phase audio pre-amp signal from the master amplifier. In this subwoofer wiring configuration the master amplifier sends the positive signal to the subwoofer while the slave amplifier sends the negative signal, making an externally bridged speaker connection. (Refer to *External Synced Bridged* section of this guide for amplifier and speaker connection diagrams.)

NOTE: Amplifiers in this combination can only be connected in matched pairs. Multiple matched pairs may be added to drive separate subwoofer loads in a given system.

Combined Amplifiers Gain and Filter Settings

NOTE: You **MUST** set the Subsonic, EQ, and other filter settings on the master amplifier to the same positions to achieve safe, optimal results. Adjustment guidelines are discussed in the *Crossover and Gain Adjustment* section of this guide.

PARALLEL SYNCED GAIN CONNECTIONS/SETTINGS

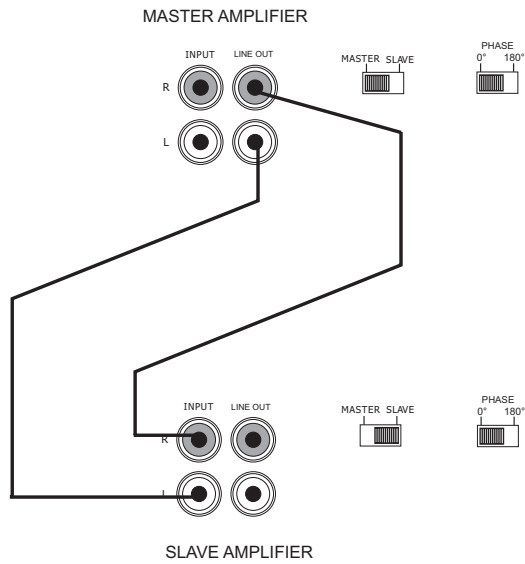
Refer to figure 5 for wiring details.

1. **Input Signal** - Connect these RCA jacks as described in the *Front Panel Connection* section of this guide.
2. **Slave/Master Switch**
 - Set the slave/master switch on the master amplifier to the MASTER position.
 - Set the slave/master switch on the slave amplifier to the SLAVE position.
 - Setting the slave/master switch on both amplifiers will automatically set the I/O RCA jack configuration according to each amplifier's slave or master designation.
3. **Phase Switch** - Set the phase switches of all synced amps to the same position (all at 0° or all at 180°).
4. In order to achieve safe, optimal performance, the LPF, Bass EQ, and Subsonic Filter controls on all synced amps must be set to the same position.
5. **Signal Connection** - Connect an RCA cable between the OUT RCA jack of the master amplifier and the SLAVE IN RCA jack of the slave amplifier as shown in the Figure 5.
6. **Subwoofer Speaker Connection** - In this amplifier combination each amplifiers must drive its own separate subwoofer(s). Connect the speaker terminals of each amplifier to any combination of one or more subwoofers that results in nominal impedance between one (D600) and four ohms. Make sure that each amplifier sees the same speaker impedance.

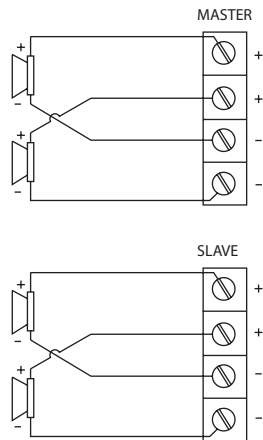
NOTE: One master amplifier can control up to three slave amplifiers in this combination. Multiple identical master/slave combinations can be added to any given system.

WARNING: The amplifier's gain control is bypassed completely in SLAVE mode. Do **NOT** move the MASTER/SLAVE switch to SLAVE position when the amplifier is connected and playing. Do **NOT** connect any signal source to the amplifier in SLAVE mode that exceeds 200mV.

FIGURE 5—PARALLEL SYNC GAINED D1200/D2400



Subwoofer Wiring (top view)



NOTE: The dual + and - sub-out terminals of the D1200/D2400 are paralleled internally and the combined load impedance should be taken into consideration when connecting multiple subwoofers.

EXTERNAL SYNCED BRIDGED CONNECTIONS/SETTINGS

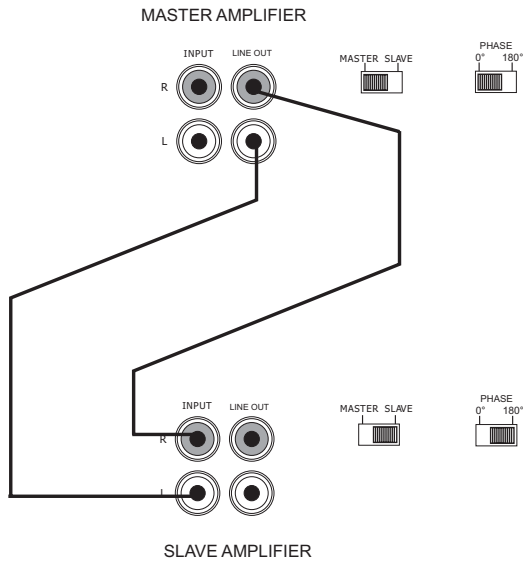
1. **Input Signal** - Connect these RCA jacks as described in the *Front Panel Connection* section of this guide.
2. **Slave/Master Switch**
 - Set the slave/master switch on the master amplifier to the MASTER position.
 - Set the slave/master switch on the slave amplifier to the SLAVE position.
 - Setting the slave/master switch on both amplifiers will automatically set the I/O RCA jack configuration according to each amplifiers slave or master designation.
3. **Phase Switch** - Set the phase switches of all synced MASTER amps to 0°. Set the phase switches of all synced SLAVE amps to 180°. The master and slave amps must be set to the opposite phase mode in order for External Synced Bridged operation to work.
4. In order to achieve safe, optimal performance, the LPF, Bass EQ, and Subsonic Filter controls on all synced amps must be set to the same position.
5. **Signal Connection** - Connect an RCA cable between the OUT RCA jacks of the Master amplifier and the INPUT RCA jack of the Slave amplifier as shown in Figure 6.
6. **Subwoofer Speaker Connection** - In this amplifier combination the Subwoofer speaker terminals of both amplifiers drive common subwoofer(s). Use the following speaker connection diagram when connecting the subwoofers to the amplifiers. Connect the amplifiers speaker terminals to any combination of one or more subwoofers that results in a nominal impedance between 2 and 4 ohms. DO NOT connect loads of less than 2 ohms when connecting to amplifiers in the External Synced Bridged combination.

NOTE: Amplifiers in this combination can only be connected in matched pairs. Multiple matched pairs may be added to drive separate subwoofer loads in a given system.

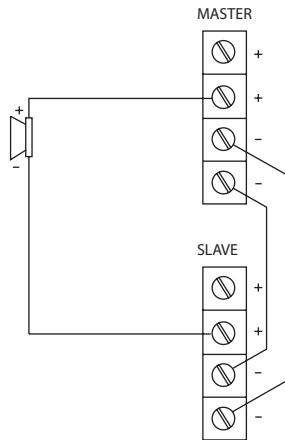
WARNING: Two wires of 12AWG minimum must be connected between the negative sub out terminals of the master and slave amplifiers.

WARNING: The amplifier's gain control is bypassed completely in SLAVE mode. Do **NOT** move the MASTER/SLAVE switch to SLAVE position when the amplifier is connected and playing. Do **NOT** connect any signal source to the amplifier in SLAVE mode that exceeds 200mV.

FIGURE 5—EXTERNAL SYNCED BRIDGE



Subwoofer Wiring (top view)



MULTIPLE AMPLIFIER COMBINATIONS

The Directed D1200/D2400 subwoofer amplifiers can also be used in multiples of the master/slave combinations allowing for unlimited expansion to a systems subwoofer section. To use multiples of amplifier combinations the following directions must be adhered to for best results.

- **Audio signal** - Divide the head unit or processor audio signal to the master amplifiers by using RCA Y adapters. Be sure to divide them an even number of times to ensure the input level at each master amplifier is matched.
- **Amplifier configuration** - Set up each master/slave amplifier combination as described for the combination type being used. (Refer to the *Parallel Synced Gain* or the *External Synced Bridged* section of this guide for amplifier and speaker connection descriptions.)

CROSSOVER SETTINGS AND GAIN ADJUSTMENT

Your Directed Audio power amplifier needs to be adjusted carefully to achieve maximum performance. These are some guidelines to follow when fine-tuning the amplifier.

- Because this amplifier is only designed for subwoofer applications, the low-pass crossover is active at all times. The crossover point is adjustable to allow more precise system operation.
- Try and keep the setting low enough to prevent image smearing (you should not be able to hear male voices from the subwoofer) but not so low as to create a gap between the subwoofer and the mid-bass/midrange speakers. It will be to your advantage to spend some extra time with this adjustment, listening to familiar music or system set-up discs to achieve the kind of musical reproduction that you prefer.
- The gain adjustment allows you to set proper signal match for clean, quiet amplifier operation. Start by playing some music you are familiar with. With the gain adjustment on the amplifier in the middle of its rotation, bring up the volume on your head unit to the 3/4 volume setting or until you start to hear distortion or clipping. If you hear distortion before you reach the 3/4 volume setting of your head unit, reduce the gain setting on the amplifier and start to raise the head unit volume again. When you can listen to the music at or slightly above 3/4 on your head unit without audible distortion, slowly raise the gain of the amplifier until distortion is heard, then back off the gain until the distortion is not audible. This setting will allow you to reach full output with all but the quietest of source material, while avoiding excessive noise in the system.
- For systems using the Remote Sub Level Adjustment, increase the subwoofer gain on the amplifier by 25% and set the Remote Sub Level knob to the center position after making all system gain and filter adjustments. This will give the Remote Sub Level Control a wider range of adjustment to the subwoofer output.
- You should take into consideration the effect that gain adjustment has on system frequency response and staging. Again, plan on spending some time with music that you know getting the gain and crossover settings the way you like. Test discs and analyzers may help with this process, but in the end it's your ears that count—listen to the music!

LED TUBE INSTALLATION (OPTIONAL)

This Directed Audio amplifier has been designed with a custom heat sink that can accommodate two (optional—not supplied) VARAD LED tubes.

1. Before installing the LED tubes, remove and discard the mounting feet from the VARAD LED tubes.
2. Slide each LED tube assembly into your Directed Audio amplifier heat sink. Ensure that the LEDs are facing out for optimal visibility. The wires from the LED tube assembly should be on the signal input end of the amplifier. The Black wire from the LED tube is ground and the Black/White wire from the LED tube is power.
4. Run the two wires from the tube assembly and connect them to the 4-pin LED/FAN input connector. Refer to the LED/FAN harness diagram given earlier in this manual.

NOTE: If the optional fan IS NOT being used, it is recommended that the second LED tube be wired to this circuit. If the optional fan is being used, it is recommended that the second LED tube be wired in parallel with the first LED tube.

Use the following cross reference chart to select the proper length VARAD LED tube for use with your Directed Audio amplifier.

Directed Amplifier—VARAD Cross Reference Chart			
Directed Part Number	Directed Model	VARAD Model	QTY Required
45120	A502	HLX6, HL6, HLW9	2
45125	A802	HLX6, HL6, HLW9	2
45150	A404	HLX6, HL6, HLW9	2
45155	A1004	HLX12, HL12, HLW15	2
45095	D600	HLX6, HL6, HLW9	2
45100	D800	HLX6, HL6, HLW9	2
45105	D1200	HLX6, HL6	2
45110	D2400	HLX12, HL12	2
45165	D2205	(2) HLX12, (2) HL12	2 or 4

CEA SPECIFICATIONS

D600

Power Output: 200 Watts RMS x 1 at 4 ohms and $\leq 1\%$ THD+N
Signal to Noise Ratio: -60 dBA (reference 1 Watt into 4 ohms)

Additional Power: 300 Watts RMS x 1 at 1 ohm and $\leq 1\%$ THD+N



D800

Power Output: 200 Watts RMS x 1 at 4 ohms and $\leq 1\%$ THD+N
Signal to Noise Ratio: -60 dBA (reference 1 Watt into 4 ohms)

Additional Power: 400 Watts RMS x 1 at 1 ohm and $\leq 1\%$ THD+N



D1200

Power Output: 300 Watts RMS x 1 at 4 ohms and $\leq 1\%$ THD+N
Signal to Noise Ratio: -60 dBA (reference 1 Watt into 4 ohms)

Additional Power: 600 Watts RMS x 1 at 1 ohm and $\leq 1\%$ THD+N



D2400

Power Output: 400 Watts RMS x 1 at 4 ohms and $\leq 1\%$ THD+N
Signal to Noise Ratio: -60 dBA (reference 1 Watt into 4 ohms)

Additional Power: 1200 Watts RMS x 1 at 1 ohm and $\leq 1\%$ THD+N



SPECIFICATIONS

	D600	D800	D1200	D2400
Maximum Watts	600W	800W	1200W	2400W
RMS continuous Power ¹	300W	300W	400W	800W
RMS continuous Power ²	N/A	400W	600W	1200W
Frequency Response	20-250Hz	20-250Hz	20-250Hz	20-250Hz
Damping Factor	50	50	50	50
Variable Low Pass Crossover 12dB slope	30-250Hz	30-250Hz	30-250Hz	30-250Hz
Subsonic Filter	Yes	Yes	Yes	Yes
Bass Boost	Yes	Yes	Yes	Yes
Input Impedance	20K	20K	20K	20K
Input Sensitivity	150mV/7.5V	150mV/7.5V	150mV/7.5V	150mV/7.5V
Output Load	2 ohms	1 ohms	1 ohms	1 ohms
Fusing	1 x 40A	2 x 25A	2 x 30A	3 x 30A
Illuminated LED Driver	Yes	Yes	Yes	Yes
External Fan Driver	Yes	Yes	Yes	Yes
Pass Through RCA Jacks	Yes	Yes	Yes	Yes

1. RMS continuous power driven into 2 ohms from 20 to 250Hz @ 14.4VDC with less than 1% THD+N.

2. RMS continuous power driven into 1 ohms from 20 to 250Hz @ 14.4VDC with less than 1% THD+N.

Directed AUDIO

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The company behind this system is Directed Electronics, Inc. Since its inception, Directed has had one purpose, to provide customers with the finest vehicle security, car stereo products, rear seat entertainment, and accessories available. The recipient of more than 20 patents in the field of advanced electronic technology, Directed is ISO 9001 registered.

Directed® is committed to delivering world-class quality products and services that excite and delight our customers.

Quality Directed products are sold and serviced throughout North America and around the world
Call 800 274 0200 for more information about our products and services

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