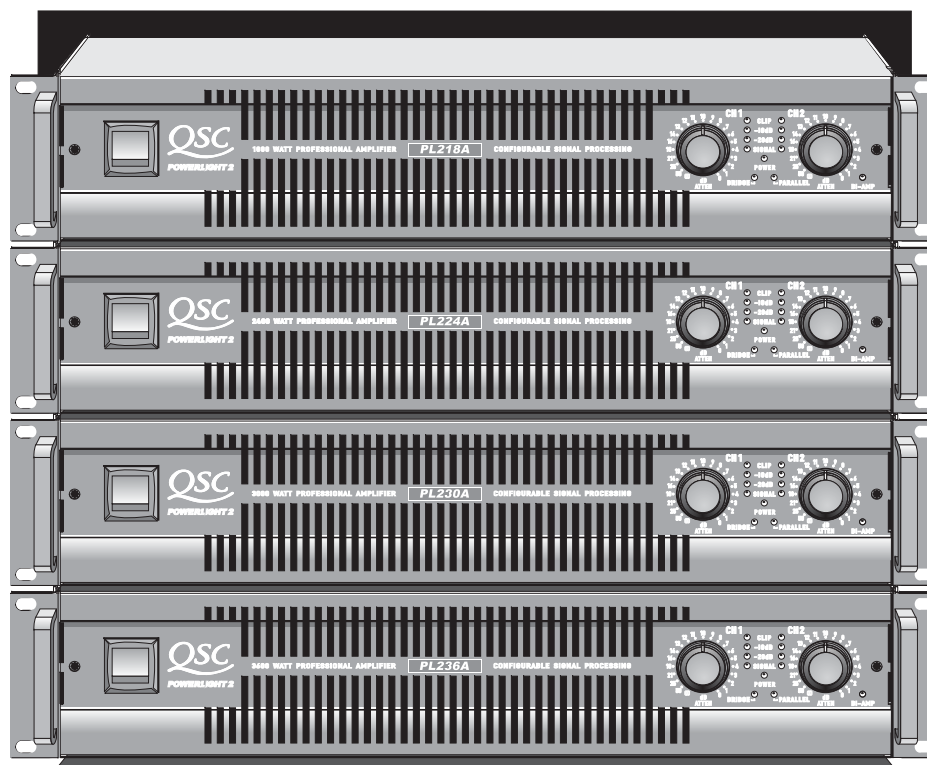


QSC™

AUDIO

POWERLIGHT 2A

User Manual
Manuel de l'utilisateur
Bedienhandbuch
Manual del Usuario



PL2A Audio Power Amplifiers
with Analog Signal Processing

- **PL218A**
- **PL224A**
- **PL230A**
- **PL236A**



TD-000089-00
Rev.B

EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous” voltage within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to humans.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



CAUTION: To reduce the risk of electric shock, do not remove the cover. No user-serviceable parts inside. Refer servicing to qualified personnel.

WARNING: To prevent fire or electric shock, do not expose this equipment to rain or moisture.

FCC INTERFERENCE STATEMENT

NOTE: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by switching the equipment off & on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

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INTRODUCTION: PL2A OVERVIEW

Thank you for the purchase of your new POWERLIGHT 2A amplifier. To get the most out of your amplifier, review this manual carefully. The installation and operation sections provide proper connection and operation guidelines.

The POWERLIGHT 2A expands upon the features of the POWERLIGHT 2. The flexibility, user-friendliness and reliability of this amplifier will make it a valuable part of your system for years to come.

The POWERLIGHT 2A was designed to fit your system. You can adjust the input sensitivity to match the output capability of your mixing board. DataPort input signals can be summed before or after internal processing so that conflicts with external processing are avoided. The 4th order Linkwitz-Riley crossover has independent adjustment of crossover frequency and defeatable low-pass delay time. The high-pass side of the crossover includes separate binary adjustments for trim and driver EQ. The precision limiters provide separate adjustment of limiter threshold, peak mode and attack/release times. You can adjust the limiter threshold between 100% and 3% of available power. The limiters have a gentle limiting knee which preserves a sense of signal dynamics. In bi-amplified systems, a slower attack/release time can be used on the low frequency channel. The limiters can also be connected together to maintain stereo balance in full range mode or frequency balance in bi-amplified mode. A peak limiting mode with a fast attack time provides protection for fragile high frequency drivers.

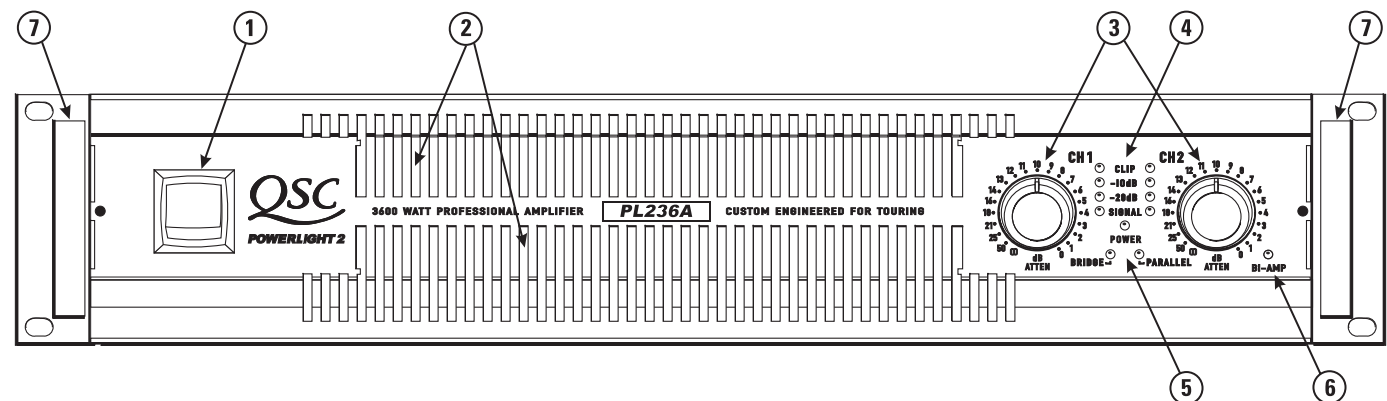
The POWERLIGHT 2A is easy to use. All operating mode switches are grouped together on the rear panel. These critical switches have color-coded LED's to positively confirm switch position. A brilliant blue LED on the front clearly indicates when the amplifier is in bi-amp mode. Limiter threshold, high-pass trim (HF ATTEN) and high-pass EQ (HORN BOOST) levels use combinations of two position switches for easy adjustment. These less used switches are located on the side panel.

The POWERLIGHT 2A is built for the long haul. Rubber-isolated XLR input connectors reduce stress on the contact pins and provide a tight, noise-free connection. All signal processing is done in side loops and then returned to the main signal path. This maintains high signal fidelity and provides a more robust system in the unlikely event a processor ceases to function.

Your new POWERLIGHT 2A amplifier will give you many years of great sound. The POWERLIGHT 2A is the most flexible, durable and best performing amplifier you can buy.

FRONT PANEL

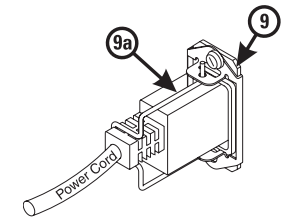
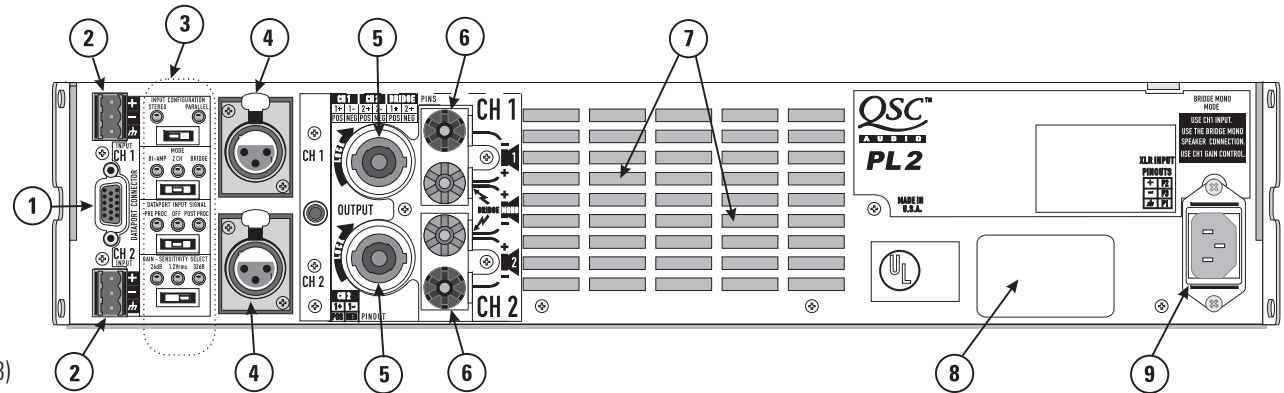
1. Power switch
2. Cooling vents
3. Gain control (1 per channel)
4. **CLIP**, **-10 dB**, **-20 dB** and **SIGNAL** indicator LEDs, 1 per channel
5. **POWER**, **BRIDGE**, and **PARALLEL** indicator LEDs
6. **BI-AMP** indicator LED
7. Handles



INTRODUCTION: PL2A OVERVIEW

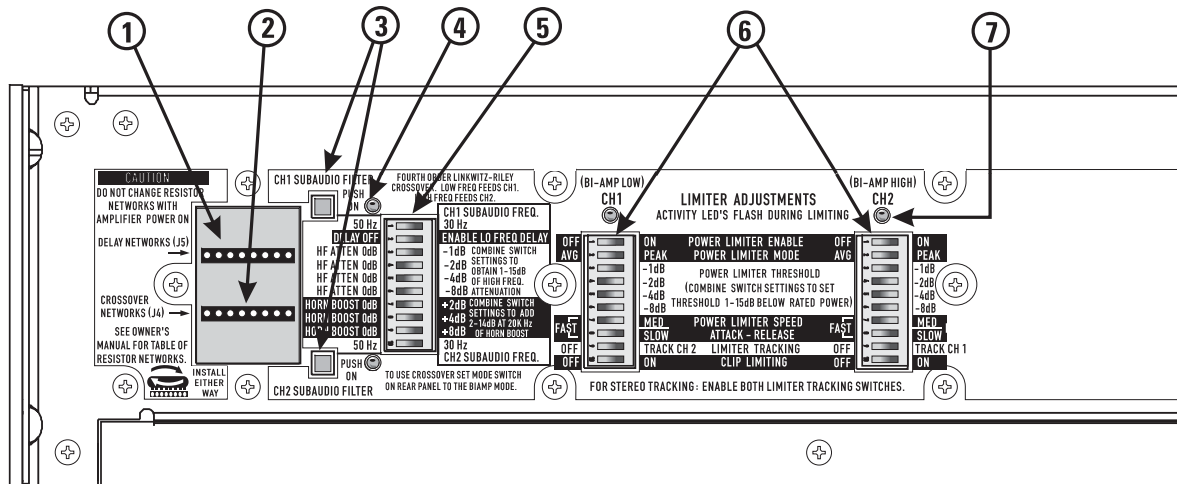
REAR PANEL

1. DataPort
2. Terminal block inputs
3. Configuration switches
4. XLR inputs
5. Speakon outputs
6. Binding post outputs
7. Cooling air inlet vents
8. Serial number label
9. IEC connector for AC power cord
- 9a. Power cord retaining clip (install on item 8)



SIDE PANEL

1. Low pass delay network SIP* socket (J5)
2. Crossover frequency network SIP socket (J4)
3. Subaudio filter push-button switches (1 per channel)
4. Subaudio filter "on" indicator LEDs (1 per channel)
5. DIP** switch for subaudio filter frequency select, low frequency delay enable, HF attenuation and horn boost
6. DIP switches for power limiting adjustments and clip limiting enable
7. Activity LEDs for indication of power limiter activity (1 per channel)



Side cover plate removed for this illustration

*SIP is the abbreviation for Single-In-line Package

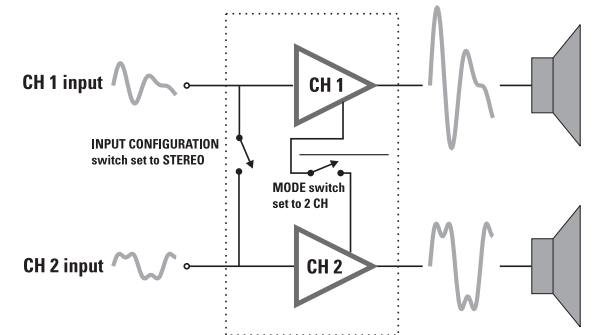
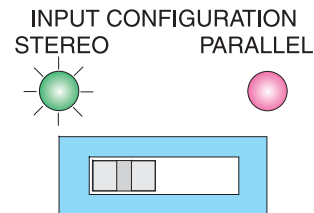
**DIP is the abbreviation for Dual-In-line Package

FEATURES & SETUP- REAR PANEL SWITCHES: INPUT CONFIGURATION

INPUT CONFIGURATION- This switch selects between **STEREO** or **PARALLEL** input configuration. The indicator LED's above the switch confirm the switch setting.

STEREO: Each input is sent to its respective channel. Each channel has independent subaudio filtering, clip limiting, gain control, and outputs. In **STEREO** mode, a full-frequency signal may be presented to each channel.

When to use STEREO input configuration: Use **STEREO** for stereo sources (L-R inputs) and any other situation that requires each channel to be completely separate from the other.

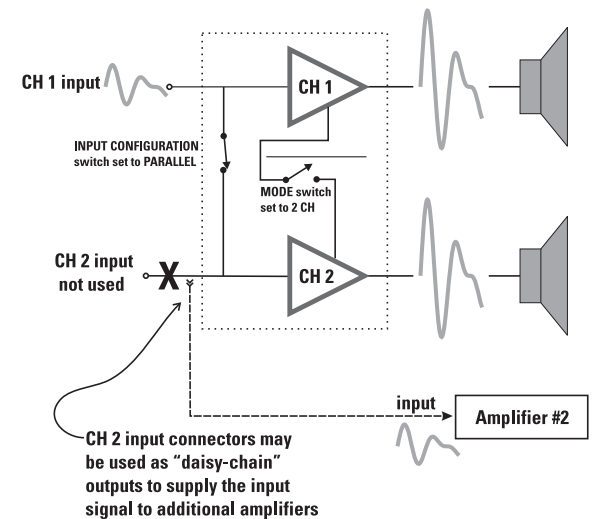
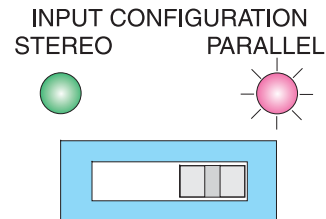


PARALLEL: The **CH 1** and **CH 2** inputs are connected together, applying a *single input signal* to both channels of the amplifier. A signal into any input jack will drive both channels. Each channel's subaudio filtering, clip limiting, and gain control still function independently. Each channel feeds its own speaker load.

You can patch the input signal on to additional amplifiers ("daisy-chain") by using any of the remaining input jacks. This feature eliminates the need for "Y" cables.

The orange **PARALLEL** LED on the front panel clearly indicates when the amplifier is configured for **PARALLEL** input.

When to use PARALLEL input configuration: Use **PARALLEL** when you need one signal to drive both channels.



NOTE: Ensure that the **INPUT CONFIGURATION** switch is set to **STEREO** when feeding two separate signals to the two channels.



NOTE: The "normal" position of the **MODE** switch is **2 CH** when operating in **STEREO** or **PARALLEL** input for the operating conditions shown above. See the following section for more information regarding the **MODE** switch.

FEATURES & SETUP- REAR PANEL SWITCHES: MODE

MODE- This switch selects between **BI-AMP**, **2 CH**, or **BRIDGE** modes of operation. The indicator LED's above the switch confirm the selection.

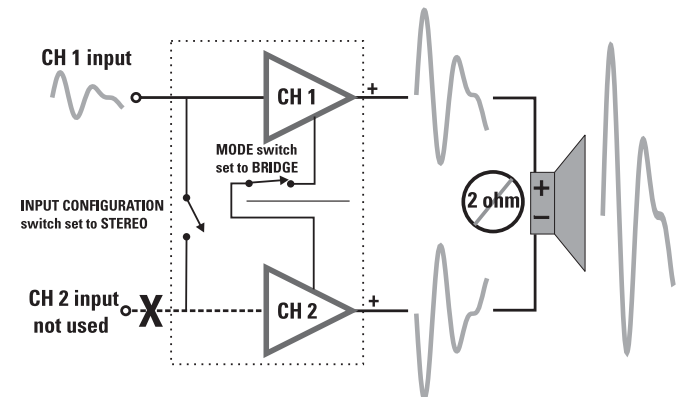
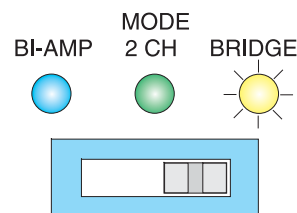
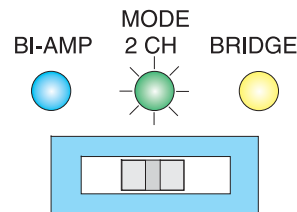
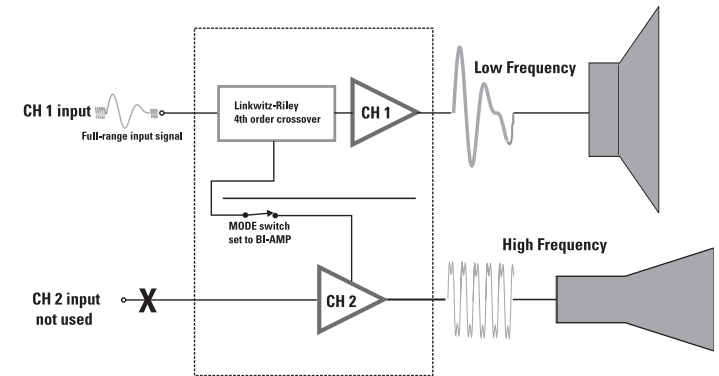
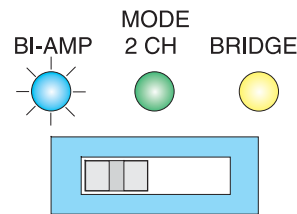
BI-AMP: This puts the amplifier into a "crossover" mode. **CH 1** receives the low frequencies and **CH 2** receives the high frequencies. The crossover is a 4th order Linkwitz-Riley. The crossover frequency and low-frequency alignment delay are "programmed" with SIP (single in-line package) resistor networks. These small plug-in networks are installed from the side of the amplifier and plug into J4 and J5. **WARNING:** Do not insert or remove networks with the power turned on. See the SIP Network Selection and Installation section for more information. The **HF ATTEN**, **HORN BOOST**, and **SUBAUDIO FILTER** controls are active in **BI-AMP** mode. The blue **BI-AMP** LED on the front panel indicates when the amp is in bi-amp mode.

When to use BI-AMP mode: Use **BI-AMP** when you need to split the high frequency and low frequency signals to power separate driver types.

2 CH: This is the "normal" mode used for stereo and parallel input configuration. Each channel carries full-frequency signals (no crossover) and is independently controlled (gain, processing, output connection).

BRIDGE: This mode combines both output channels into one output. This mode is for driving a single, high-powered load with twice the "normal" voltage swing. This results in about 4 times the peak power and about three times the sustained power of a single channel. This mode uses the input, gain control, subaudio filter, and clip limiter of **CH 1**; **CH 2**'s filter and clip limiter have no effect. The yellow **BRIDGE** LED on the front panel indicates when the amp is in **BRIDGE** mode.

When to use BRIDGE mode: Use **BRIDGE** mode when you need to deliver the power of two channels to a single 8 or 4 ohm load, such as a subwoofer. Do not use less than 4 ohm loads in **BRIDGE** mode.



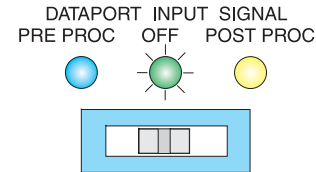
BRIDGE MODE OUTPUT CONNECTION-

Note that speaker connection for bridge mono mode is different than other modes. See section on Connections: Outputs for proper bridge mode output connections.

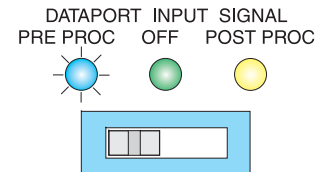
FEATURES & SETUP- REAR PANEL SWITCHES: DATAPORT INPUT SIGNAL

DATAPORT INPUT SIGNAL- This switch selects the regular inputs or the DataPort inputs, and allows the DataPort to enter before or after the analog processing. **WARNING:** There is no DataPort “flag” for this setting, so the appropriate setting must be confirmed manually.

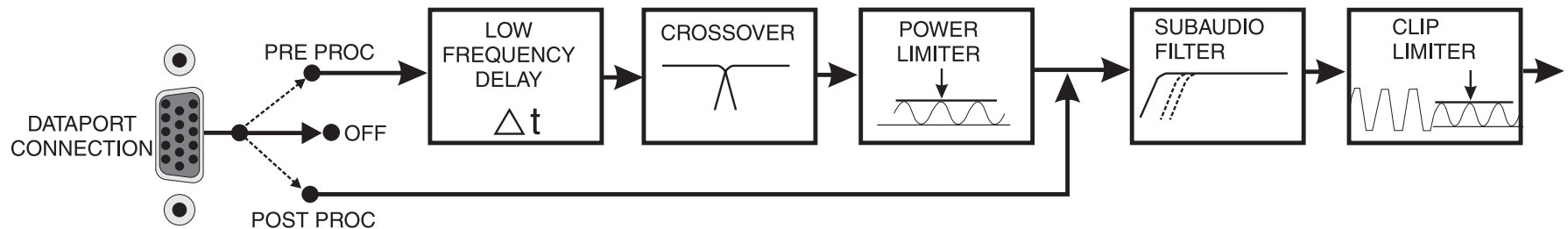
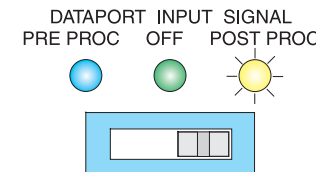
OFF: If the **DATAPORT CONNECTION** is not being used, set to the **OFF** position. The DataPort MONITOR SIGNALS and STANDBY are still active, but the DataPort input signals will not reach the amplifier.



PRE PROC: This setting will insert the **DATAPORT** signals ahead of the amplifier’s signal processor. If you are using external processing on the DATAPORT input signal, be aware that additional internal processing will be added to the signal. This may cause unexpected overall results.



POST PROC: This selection inserts the **DATAPORT** signals after the amplifier’s processor. **The subaudio filters and clip limiting remain functional**, but all other processing is bypassed. See the Block Diagram for more detailed signal flow information.

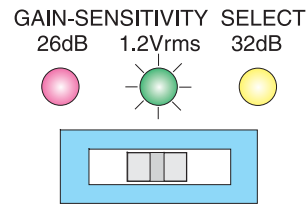


DATAPORT signal routing options using the DATAPORT INPUT SIGNAL switch

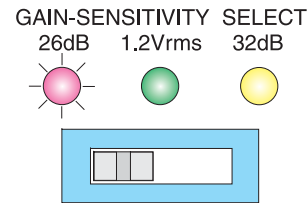
FEATURES & SETUP- REAR PANEL SWITCHES: GAIN-SENSITIVITY SELECT

GAIN-SENSITIVITY SELECT- This switch selects the gain structure of the amplifier. Each channel runs through a gain buffer which allows all models to have either a uniform 1.2 Vrms input sensitivity or a uniform 26 or 32 dB of voltage gain (all measured with the **GAIN** controls at maximum). The internal signal leaving this stage is approximately +4 dB, leaving about 16 dB of headroom for the rest of the signal processing. NOTE: The **GAIN-SENSITIVITY SELECT** setting does not effect DataPort gain in any mode.

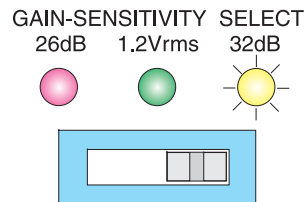
1.2 Vrms: This selection sets the input sensitivity to approximately 1.2 Vrms. This is the input voltage required to drive the amplifier to rated output power into an 8 ohm load.



26 dB: This selection sets the maximum voltage gain of the amplifier to approximately 26 dB.



32 dB: This selection sets the maximum voltage gain of the amplifier to approximately 32 dB.



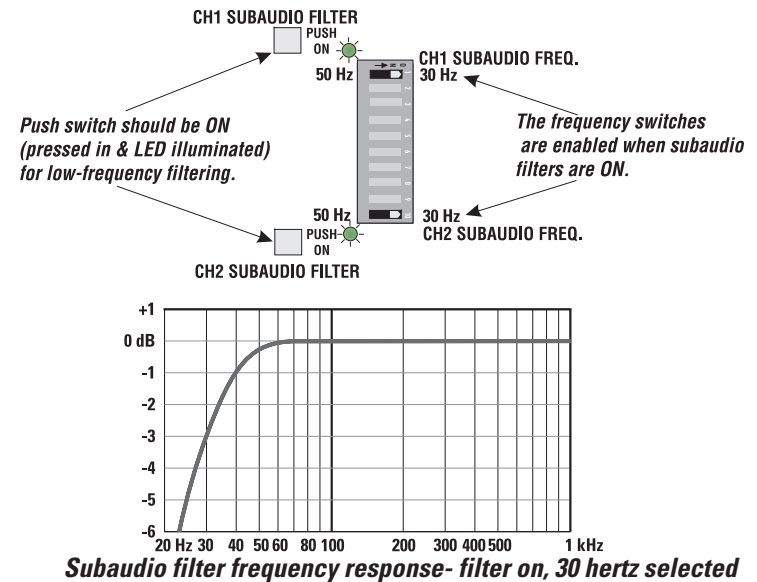
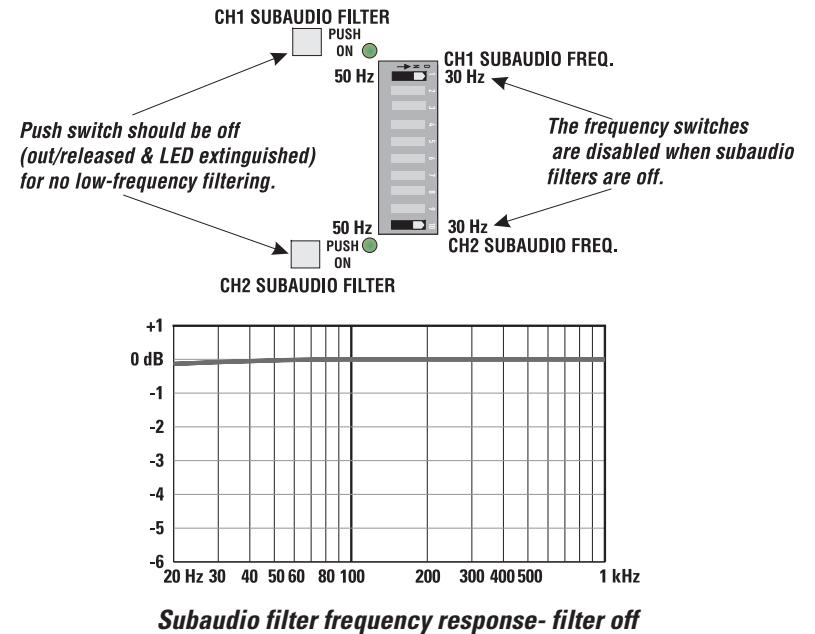
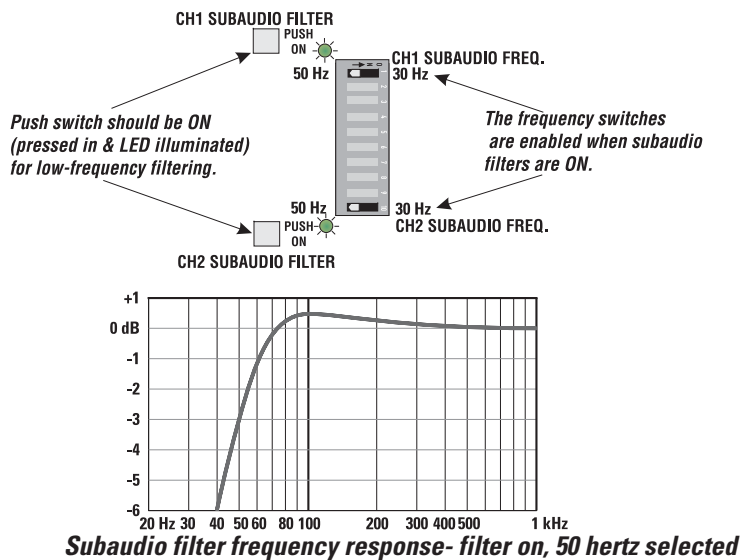
FEATURES & SETUP- SIDE PANEL SWITCHES: SUBAUDIO FILTER and SUBAUDIO FREQUENCY

The side panel cover plate must be removed to access the side panel switches.

CH1 SUBAUDIO FILTER, CH2 SUBAUDIO FILTER- These push-button switches are used to turn on or off the **SUBAUDIO FILTER** for each channel. *Press the switch in for ON; the green LED illuminates when the filter is ON. Push in and allow the switch to release for OFF; the green LED extinguishes when the filter is OFF.*

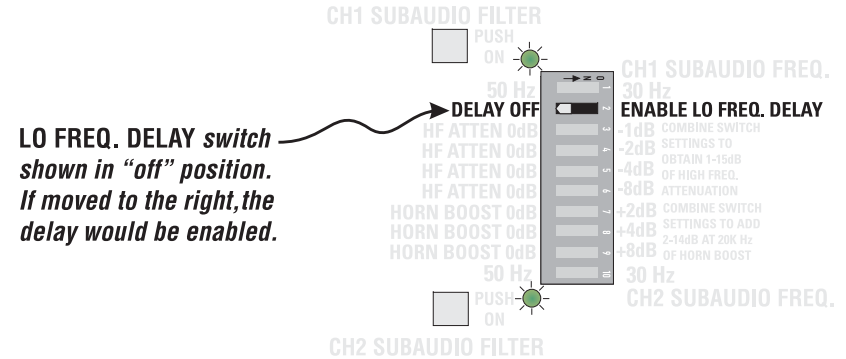
The filter's roll-off frequency is determined by each channel's **SUBAUDIO FREQUENCY** switch. When the filter is switched OFF, a 5 hertz roll-off frequency protects the load against DC or deep subaudio output from the amplifier. *Unless you already have filtering upstream of the amplifier, use the SUBAUDIO FILTER to protect your speakers from cone over-excursion caused by frequencies below the speaker's limits.* The OFF position should be used only for subwoofer systems with rated frequency response below 30 hertz or if low frequency filtering is provided by other devices.

CH1 SUBAUDIO FREQUENCY, CH2 SUBAUDIO FREQUENCY- These switches determine the low frequency roll-off of the **SUBAUDIO FILTER**. Generally, match the frequency selection to your speaker's low frequency capability. This improves speaker performance by limiting subaudio cone movement, making more power available for the speaker's rated frequency range. **30 Hz** and **50 Hz** are the available settings. If the **SUBAUDIO FILTER** switches are OFF, these settings will have no effect. These switches are located on sections 1 and 10 of the left-most DIP switch.

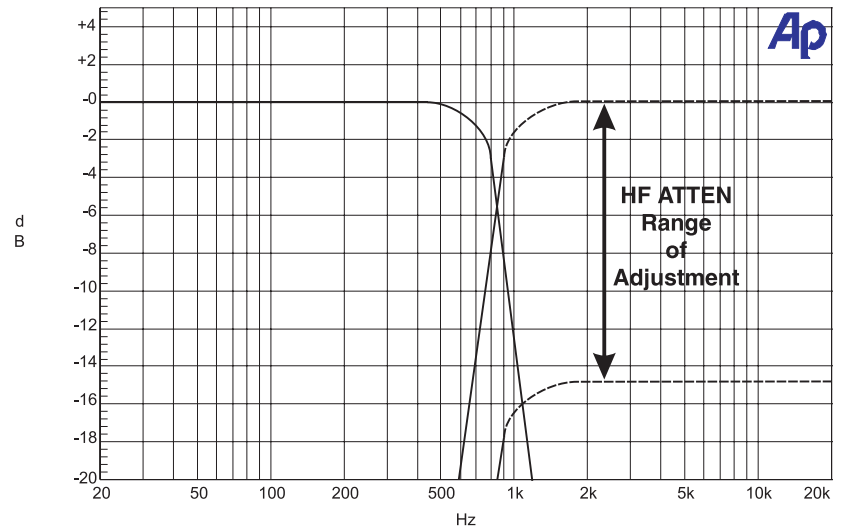
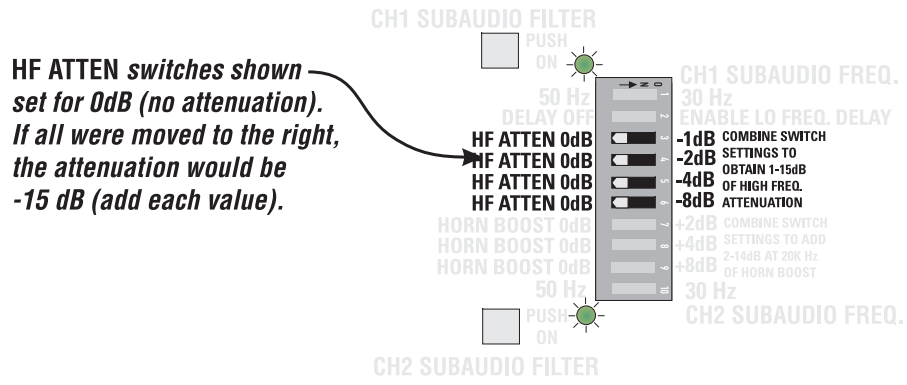


FEATURES & SETUP- SIDE PANEL SWITCHES: LO FREQ DELAY and HF ATTEN

LO FREQ DELAY- This switch is active only when the amplifier is in **BI-AMP** mode. This switch controls an additional analog delay which adds to the inherent delay of the low frequency filter. The amount of delay is determined by the SIP programming network installed in the **DELAY NETWORK** socket (**J5**). **DELAY OFF** disables the delay. **ENABLE LO FREQ DELAY** activates the delay. Refer to the SIP network value selection chart for more information.



HF ATTEN- These switches are active only when the amplifier is in **BI-AMP** mode. These four switches (section 3, 4, 5, and 6 of the left-most DIP switch) work in combination to control the amount of high-frequency attenuation. The amount of attenuation can be selected in 1dB steps from 0 to 15 dB. Add the selected switch values for the total attenuation. EXAMPLE: Setting -1 dB and -4 dB results in -5 dB of high frequency attenuation.

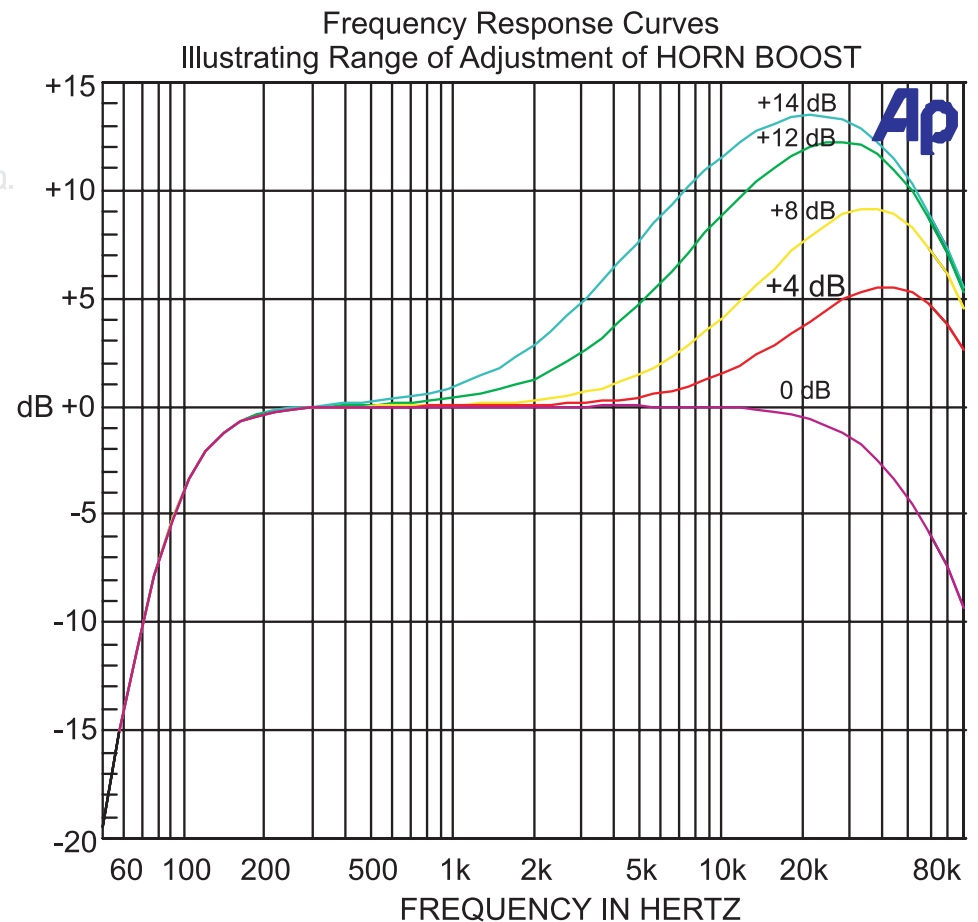
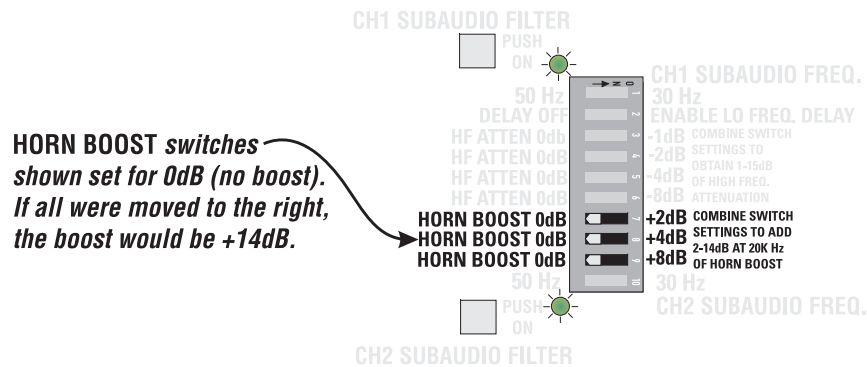


Typical crossover frequency response curve showing the range of adjustment of the HF ATTEN switches.

Crossover frequency is programmable.

FEATURES & SETUP- SIDE PANEL SWITCHES: HORN BOOST

HORN BOOST- These switches are only active when the amplifier is in **BI-AMP** mode. These switches work in combination to control the amount of high-frequency horn boost. The horn boost is adjustable from 0 to 14dB in 2dB steps as measured at 20 kHz. Add the values of the selected switches for the total boost.



FEATURES & SETUP- SIDE PANEL SWITCHES: POWER LIMITER

POWER LIMITER: Each channel has its own limiter with independently adjustable threshold and time constants. A ten-section switch for each channel controls the limiter settings.

LIMITER ACTIVITY LED's: Just below the CH 1 and CH 2 labels you will note a clear circle which has a yellow LED behind it. Each LED illuminates only when its limiter is reducing gain. Therefore, the LED activity tells you how hard the limiter is working and shows the limiter time constant (see SPEED).

POWER LIMITER ENABLE: Set this switch to ON to activate the limiter for each channel. NOTE: The Limiter Activity LED does not illuminate until the output power reaches the limiter threshold.

POWER LIMITER MODE:

AVG mode tracks the program level with moderate attack and release rates (SPEED is set below). This setting does not respond strongly to isolated peaks and therefore gives the smoothest results.

PEAK mode causes limiting to increase abruptly, even on short peaks. It provides faster protection, but causes more audible "ducking" of the program level.

POWER LIMITER THRESHOLD: These four switches control the threshold where limiting begins in 1 dB steps relative to the amplifier's rated power. The limiting characteristic has a soft knee which begins several dB below the threshold. The threshold is reached at 6 dB of limiting. Slope is 8:1 on **AVG** mode, and 15:1 on **PEAK** mode.

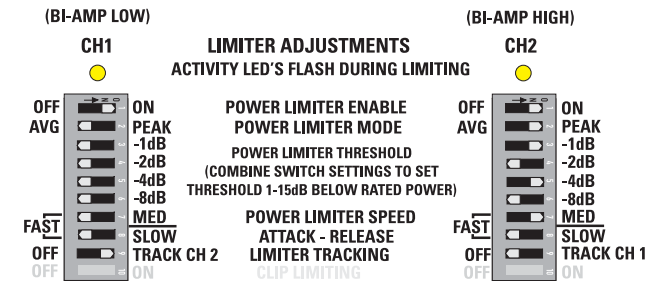
To enter the desired power, find the amplifier's rated power at your load impedance (see Specification section), determine the desired percentage of power and consult the table at right to convert this to the nearest dB setting. Then combine switch settings to obtain the desired setting.

EXAMPLE: You want limiting to occur at 100 watts, using a 4 ohm load. You are using a PL230A which is rated for 900 watts into 4 ohms. Therefore, you want to limit at 11% of this power. This falls between -9 dB and -10 dB on the table (below). We enter -10 dB by setting the -8 dB and -2 dB switches.

POWER LIMITER SPEED, ATTACK-RELEASE: Three overall response times or "speeds" are available. Although it may seem desirable to have rapid response in all cases, a limiter should not change gain appreciably during an individual cycle of audio, as this causes intermodulation (IM) distortion. Therefore the speed must be slow enough to pass the lowest frequency intended, without unwanted modulation. Otherwise the low frequency tones cause "garbling" of the highs. The speed settings adjust the release time which governs how much the limiter can change from one cycle to the next. The **AVG** mode (described above) has a 25% attack time relative to this release time, so the gain changes gradually in both directions. The **PEAK** mode has a 1 to 2% attack time and therefore gain reduction can occur quickly for more protection. However, gain increase is still controlled by the overall **SPEED** setting, and therefore, the same frequency range applies.



NOTE: The time constants for each setting are determined by internal capacitor values which can be changed by a qualified service technician. Consult QSC Technical Services for more information.



FOR STEREO TRACKING: ENABLE BOTH LIMITER TRACKING SWITCHES

Limiter adjustment DIP switches.

Settings shown are for example only.

| % POWER | dB | Switch Setting |
|---------|-------|---|
| 100% | 0 | all threshold switches off |
| 80% | -1dB | set -1dB switch only |
| 63% | -2dB | set -2dB switch only |
| 50% | -3dB | set -1dB and -2dB switches |
| 40% | -4dB | set -4dB switch only |
| 32% | -5dB | set -1dB and -4dB switches |
| 25% | -6dB | set -2dB and -4dB switches |
| 20% | -7dB | set -1dB, -2dB and -4dB switches |
| 16% | -8dB | set -8dB switch only |
| 12.5% | -9dB | set -1dB and -8dB switches |
| 10% | -10dB | set -2dB and -8dB switches |
| 8% | -11dB | set -1dB, -2dB and -8dB switches |
| 6.3% | -12dB | set -4dB and -8dB switches |
| 5% | -13dB | set -1dB, -4dB and -8dB switches |
| 4% | -14dB | set -2dB, -4dB and -8dB switches |
| 3.2% | -15dB | set -1dB, -2dB, -4dB and -8 dB switches |

Power limiter switch settings for all possible combinations

FEATURES & SETUP- SIDE PANEL SWITCHES: POWER LIMITER (continued from previous page)

FAST- Set both **POWER LIMITER SPEED** switches to **FAST**. This setting produces 20 milliseconds (0.020 seconds) of release time. The AVG mode will produce 8 milliseconds of attack time, and PEAK mode will produce less than 1 millisecond of attack time. This setting will have low distortion down to about 1 kHz. It is suitable for high frequency protection, but will cause a distinctly “muddy” effect when used on full range material.

MED- Set the upper **POWER LIMITER SPEED** switch to **MED** and the lower switch to **FAST**. This setting produces 200 milliseconds of release time. The AVG mode produces 80 milliseconds of attack time and the PEAK mode produces 10 milliseconds of attack time. This setting is the fastest possible setting for full range material and may still produce some IM distortion for extremely low frequencies.

SLOW- Set the lower **POWER LIMITER SPEED** switch to **SLOW** and the upper switch to **FAST**. This setting provides 4 seconds of release time. The AVG mode produces 1.6 second of attack time and the PEAK mode produces 180 milliseconds of attack time. This setting will change the gain very gradually in the AVG mode, and sudden peaks may clip for 1 to 2 seconds. The PEAK mode will push overloads down quickly, but recovery time will still take many seconds.

POWER LIMITER TRACKING- Each channel's power limiter operates independently, with its own threshold and time constants.

Four tracking modes are available for your use:

1- No Tracking-- switch section 9 of *both* limiter adjustment DIPs should be set to **OFF**. This is the “usual” mode where neither channel's limiting effects the other.

2- CH 1 tracks the limiter activity of CH 2-- switch section 9 of channel 1's limiter adjustment DIPs should be set to **TRACK CH 2** and switch section 9 of channel 2's limiter adjustment DIPs should be set to **OFF**. This tracking mode is not often used, but is applied to paging environments with high ambient noise levels. Limiting on channel 2 will cause limiting to occur on channel 1. Channel 2 is set up for a vocal-range horn and carries the voice page; its limiter is set for MED speed and PEAK mode with a power threshold and gain setting that produces proper paging level. Channel 1 is set up for a full-range music speaker with its level set for comfortable listening against the ambient noise. When a page drives channel 2 into limiting, channel 1 is driven “down” also, making the page more audible against the background noise. Some experimentation with channel 2's gain and threshold will be required for best performance with a range of paging voices & levels.

3- CH 2 tracks the limiter activity of CH 1 (bi-amp tracking) -- switch section 9 of channel 2's limiter adjustment DIPs should be set to **TRACK CH 1** and switch section 9 of channel 1's limiter adjustment DIPs should be set to **OFF**. This tracking mode is useful for high frequency bi-amping, using fast protection on the horn without “ducking” the low frequencies. When used carefully, this mode can protect each driver in a two-way system, while preserving musical dynamics and balance.

We offer the following suggestions as a starting point for bi-amp tracking:

TWO-WAY SPEAKER WITH A FAIRLY HIGH CROSSOVER FREQUENCY- Most of these systems have a large cone low frequency driver and a comparatively delicate high frequency driver. The limiting is tailored for each driver; higher power threshold and slower limiter speed for the low frequency driver and a lower power threshold and faster limiter speed for the high frequency driver.

The low frequency driver can handle short time overloads, so its limiter can be set to the slower responding **AVG** (average) mode with **MED** to **SLOW** overall limiting times. Short peaks may clip, but the overall limiting will be smooth and gradual with no low frequency distortion and a minimum of “ducking”. If there is too much clipping, try the **CLIP LIMITER** or use the **PEAK** mode and **MED** speed.

FEATURES & SETUP- SIDE PANEL SWITCHES: CLIP LIMITER

POWER LIMITER TRACKING- continued

The high frequency driver requires a lower power threshold and fast limiting response. Try the FAST setting and the PEAK mode. Short peaks will be limited aggressively, but signals will return to normal almost instantly. This response (fast with low threshold) would have too much "ducking" and low frequency distortion for use with full range material.

Once each driver has optimal protection, you need to make them work properly together. When only one channel is limiting, the frequency balance will be upset. This may not be a problem with some material, but testing is required. The different tracking "modes" offer different solutions. For example, if the crossover frequency is low, both drivers may have similar power capacities and protection speed requirements. For this type of bi-amping, you may find that "mode" 4 (stereo tracking, below) offers the best sound performance. Experimentation with the actual speakers is needed.

4- Each channel tracks the other (stereo tracking)-- switch section 9 of both channel's limiter adjustment DIP switches should be set to the right (**TRACKS CH 2** and **TRACKS CH 1**). Stereo playback usually uses matched speakers and thus if one channel limits, it will effect the image and placement of the instruments. When each channel tracks the other, any limiting on one channel causes limiting on the other, preserving the overall "balance" while protecting the speakers. The power threshold and speed settings for each channel should be matched.

CLIP LIMITER: The PL2A amplifier also has separate limiters which respond only to amplifier clipping. These may be used with or without the adjustable Power Limiters.

When the audio signal drives the amp's output circuit beyond its power capability, the amp clips and flattens the peaks of the waveform. The clip limiter detects this and quickly reduces the gain to minimize the amount of overdrive. To preserve as much of the program dynamics as possible, limiting occurs only during actual clipping.

Each channel has its own clip limiter that can be switched on or off independently, as shown at right.

When to use it-

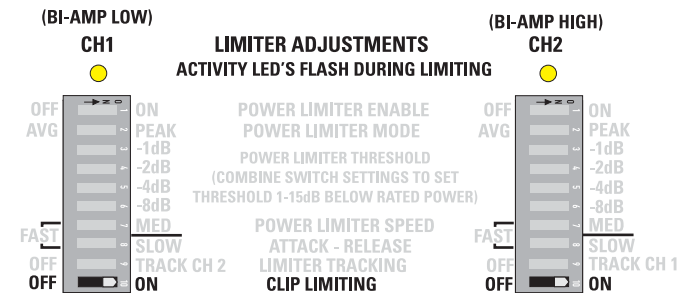
When driving full-range speakers, clip limiting reduces high frequency distortion caused by bass overloads. It also protects high frequency drivers from excess overdrive and harsh clipping harmonics.

We recommend using the clip limiters in all applications.

NOTE: After all side panel switches have been set and SIP resistor networks installed, verify your setup and reinstall the side cover plate to keep dirt, dust, and foreign objects from entering the chassis.



CAUTION: Clip limiting reduces extreme overdrive peaks, allowing a higher average signal level without audible distortion. However, increasing the gain with the clip limiter engaged, until clipping is again audible, can double the average output power. Be careful not to exceed the power rating of your speakers.



FOR STEREO TRACKING: ENABLE BOTH LIMITER TRACKING SWITCHES.

Clip limiter switches are at the bottom of each LIMITER ADJUSTMENT DIP switch (1 per channel)

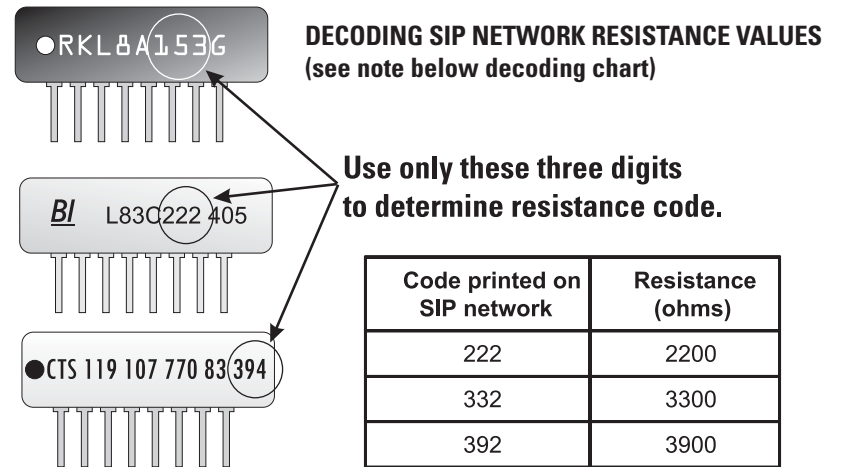
FEATURES & SETUP- SIDE PANEL: CROSSOVER & DELAY NETWORK SELECTION & INSTALLATION

SIP RESISTOR NETWORK INSTALLATION GUIDELINES AND SELECTION INFORMATION

Your PL2A amplifier is shipped configured to order with SIP networks installed. If the factory set up is not applicable for your application, then you will need to know your desired crossover frequency and low frequency delay time in order to select the corresponding SIP resistor network values. Refer to the selection chart, below, for nominal crossover frequency and delay values.

A general guideline would be to **never use a larger value of delay SIP than that used for the crossover.** After choosing the desired values from the selection chart, locate the plastic bag containing the SIP networks and locate the desired value.

| Resistor Network Value (ohms) | Nominal Crossover Frequency (hertz) | Nominal Low Frequency Delay Time (mSec.) |
|-------------------------------|-------------------------------------|--|
| 2200 | 2500 | 0.14 |
| 3300 | 1800 | 0.21 |
| 3900 | 1500 | 0.24 |
| 4700 | 1300 | 0.29 |
| 5100 | 1200 | 0.32 |
| 5600 | 1000 | 0.34 |
| 8200 | 750 | 0.49 |
| 15000 | 500 | 0.85 |
| 27000 | 300 | 1.38 |
| 33000 | 250 | 1.61 |
| 47000 | 200 | 2.08 |
| 82000 | 150 | 2.93 |
| 150000 | 125 | 3.90 |
| 390000 | 100 | 5.17 |
| No Network Installed | 85 | 6.50 |



| Code printed on SIP network | Resistance (ohms) |
|-----------------------------|-------------------|
| 222 | 2200 |
| 332 | 3300 |
| 392 | 3900 |
| 472 | 4700 |
| 512 | 5100 |
| 562 | 5600 |
| 822 | 8200 |
| 153 | 15000 |
| 273 | 27000 |
| 333 | 33000 |
| 473 | 47000 |
| 823 | 82000 |
| 154 | 150000 |
| 394 | 390000 |

NOTE: Due to the number of manufacturers of SIP resistor networks, we can not possibly provide examples of all the various part number marking schemes. We have provided the three most common marking schemes, above. If the SIP networks you have received do not conform to one of the above schemes, QSC's Technical Services Department will be glad to assist you in determining the resistance value of your SIPs. Alternatively, you could measure the resistance value with a multimeter; simply set you meter to the proper resistance range and connect your multimeter's leads to the first two pins of either end to obtain the value.

FEATURES & SETUP- SIDE PANEL: CROSSOVER & DELAY NETWORK SELECTION & INSTALLATION

Turn the power to the amplifier off before removing or installing SIPs!

The SIPs may be installed "either way". The SIPs are symmetrical and thus perform identically no matter which end points to the left or right. This completely eliminates "polarity" errors that might otherwise arise.

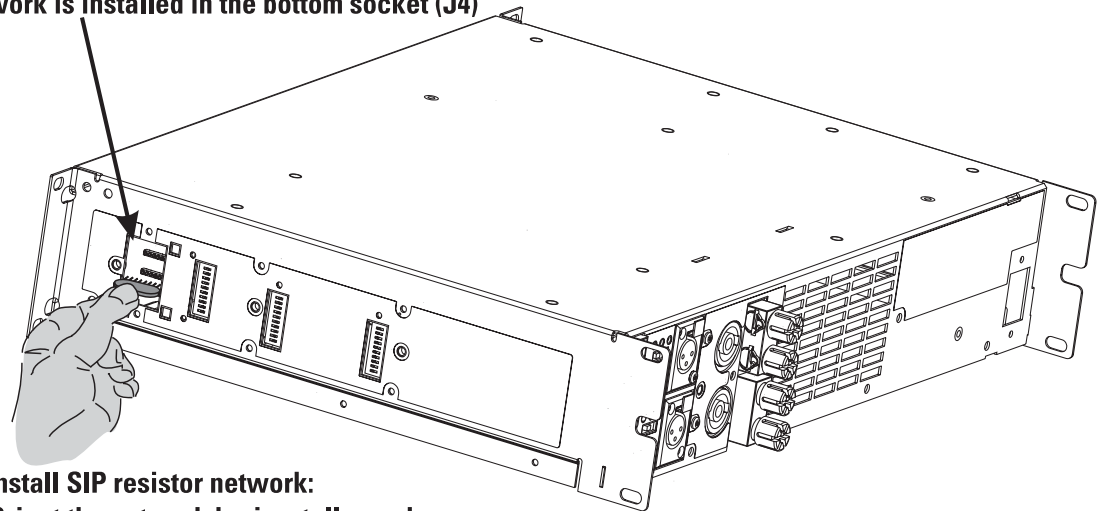
The side cover plate must be removed to access the SIP sockets. Be sure to reinstall the side cover plate after installing the SIPs.

Before installing the SIP (as shown right) ensure that the pins are straight. This will ease insertion into the jack and help to avoid damaging the pins due to misaligned insertion.



NOTE: Reinstall the side cover plate after SIP installation to keep dust, dirt, and foreign objects from entering the internal circuitry of the amplifier. Failure to do so could result in damage to the amplifier should any such material enter the chassis.

Access opening for SIP resistor networks
Delay network is installed in the top socket (J5)
Crossover network is installed in the bottom socket (J4)



To install SIP resistor network:

- 1- Orient the network horizontally as shown**
(networks are symmetrical and can be installed without worrying about "polarity")
- 2- Carefully align all 8 pins with the socket receptacles.**
- 3- Firmly push the network into the socket until it stops.**
- 4- Check your installation by ensuring all eight pins are in their respective receptacles.**
- 5- If a pin was bent and did not properly seat in its receptacle, simply pull the network back out, straighten the pins carefully, and re-install the network.**

FEATURES & SETUP: DATAPORT, FRONT PANEL LED INDICATORS, GAIN CONTROLS

DATAPORT CONNECTOR

The PL2A amplifier features a QSC DataPort connector which connects to accessory products to enhance your amplifier application. The CM16a Amplifier Network Monitor can remotely control and monitor your PL2A amplifier. The DSP-3 digital signal processor can mount directly to the rear of your PL2A amplifier, adding an incredible amount of processing power in a small, powerful module at a very competitive price.

WARNING: The PL2A amplifiers use a rear panel switch (DATAPORT INPUT SIGNAL switch) to control the input signal from the DataPort. When using a DataPort-connected accessory, be sure to set this switch to PRE PROC (blue confirmation LED illuminated) or POST PROC (yellow confirmation LED illuminated) as desired. This switch must be in the OFF position (green confirmation LED illuminated) to use the regular inputs.

OTHER ACCESSORIES-

Accessories for the PL2A amplifiers are available through your local distributor or directly from QSC. For accessory information, contact QSC's Technical Services Department or your QSC representative. Check QSC's web page for the latest product information.

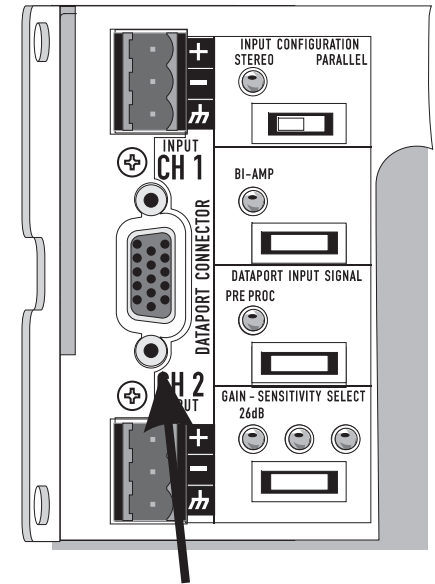
FRONT PANEL LED INDICATORS

At full brightness, the green **POWER** LED indicates that the amplifier is operating. Half brightness indicates the amp is in its start-up sequence or that the amplifier is in STANDBY mode.

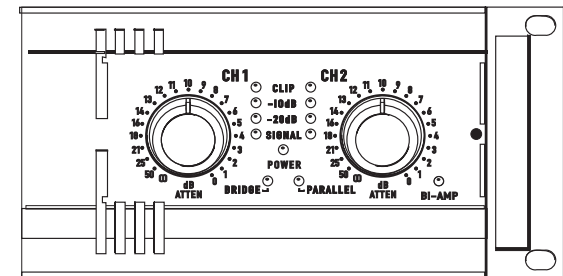
As the input signal strength increases, the green **SIGNAL**, **-20dB**, and amber **-10dB** LED indicators light respectively at 0.1%, 1% and 10% of full power. The red **CLIP** LED indicator flashes during overload (clipping). A bright, steady glow indicates protective muting. If this occurs during use, see the Troubleshooting section. The yellow **BRIDGE** LED illuminates when the amp is in BRIDGE mode. The blue **BI-AMP** LED illuminates when the amplifier is in BI-AMP mode. The orange **PARALLEL** LED illuminates when the amp is in PARALLEL input mode.

GAIN CONTROLS

The gain controls are detented (21 steps) for repeatable adjustment. Surrounding the gain control knob, the attenuation level is shown in dB. Maximum gain depends on the model and the GAIN-SENSITIVITY SELECT switch setting. For full details, see the specification section.



DataPort connector location



Front panel: gain controls and indicator LED's for signal level, clip indication, power status indication, and operating mode (bridge, parallel, bi-amp)

INSTALLATION: RACK MOUNTING AND MOUNTING DIMENSIONS



Before installing into equipment rack: ensure that all side-access DIP switches and crossover SIPs are setup as desired. They will be impossible (or extremely difficult) to change after the amplifier is installed in the rack. The side cover plate should be installed to keep dust and foreign material out of the chassis.

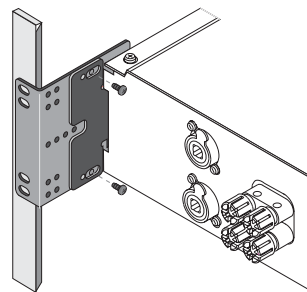
Securing the Front Ears to the Rack Rails

Use four screws and washers when mounting the PL2A amplifier to the front rails. Support the weight of the amplifier while securing it to the rails to avoid bending or distorting the front rack mount ears.

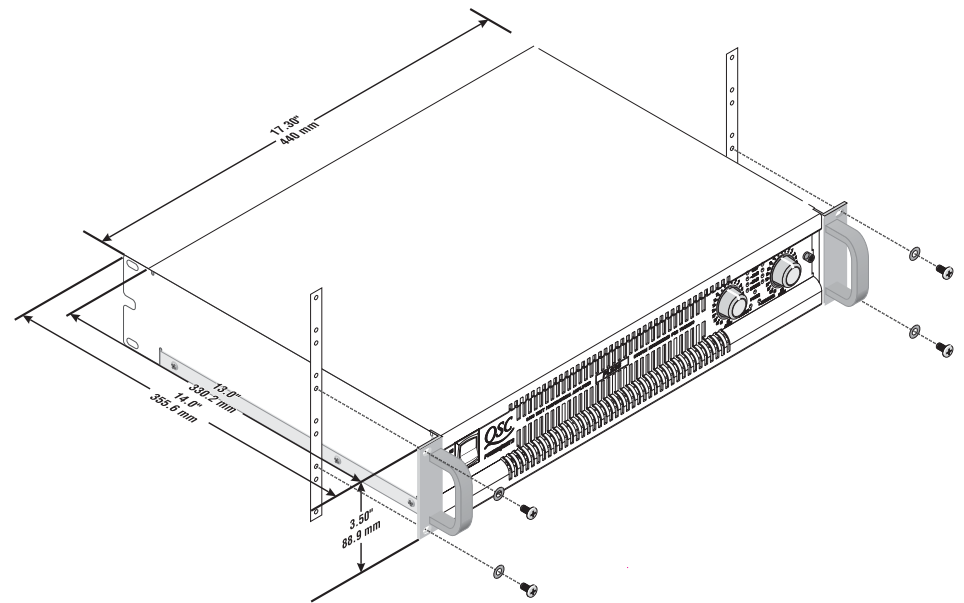
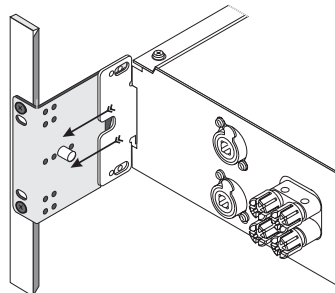
Supporting the Rear of the Amplifier

Supporting the amplifier at the rear is important, especially for mobile and touring use. Rear rack mounting ear kits are an accessory item and are available from QSC's Technical Services Department or from your dealer or distributor. The rear rack mounting ear kit may be installed in two different ways.

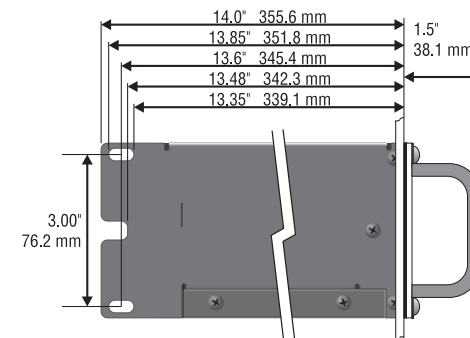
Method 1- The amplifier is first installed from the front of the rack and then the ears are secured directly to the amplifier with two machine screws as shown, left. Then the ears are secured to the rails using ordinary rail hardware.



Method 2- The amplifier is first installed from the front of the rack. Then, the accessory rear ears are positioned on the rear rack rails and secured. The pin installation position can now be selected. Install the pin so that it fits well into the slot provided on the amplifier's rear mounting tab.



PL2A rack mounting installation and major dimensions



PL2A dimensional details

INSTALLATION: FAN COOLING & AC MAINS

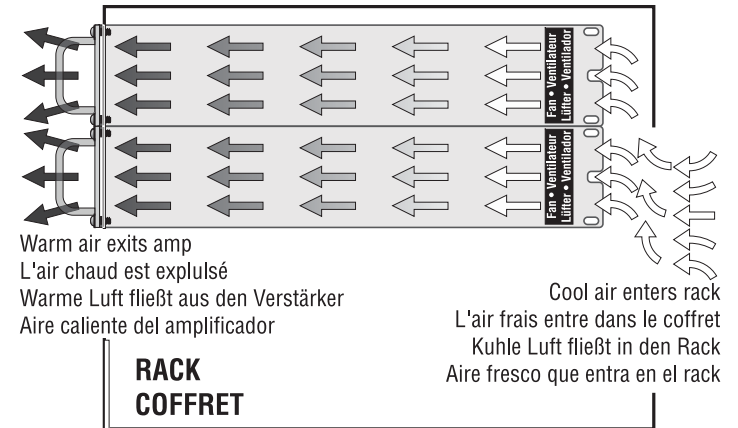
FAN COOLING

The fan varies speed automatically to maintain safe internal temperatures and minimize noise. Keep the front and rear vents clear to allow full air flow.

Hot air exhausts out the front of the amp so it does not heat the interior of the rack. Make sure that plenty of cool air can enter the rack, especially if there are other units which exhaust hot air into it.



Keep the front and rear vents clear to allow full air flow. Make sure that plenty of cool air can enter the rack, especially if there are other units which exhaust hot air into it.



Air flow in QSC amplifiers

OPERATING VOLTAGE (AC mains)

The correct AC line voltage is shown on the serial number label. Connecting to the wrong line voltage is dangerous and may damage the amplifier. The power cord attaches to the IEC connector on the rear panel. Use the cord supplied with the amplifier, or an equivalent. Insure that the wire gauge of the cord is **#14AWG**. Use of smaller wire gauges can reduce the line voltage available to the amplifier. A power cord retaining clip is provided with the amplifier. We recommend you install and use the retaining clip to prevent accidental power cord disconnection.

Use the best possible connection to the AC power source. Avoid extension cords as they will cause some voltage drop between the AC source and you amplifier. If the use of an extension cord is required, ensure that it is the largest wire size available (smaller gauge number means larger wire size). Ensure that all grounding connections are maintained.



The correct AC line voltage is shown on the serial number label.

Connecting to the wrong line voltage is dangerous and may damage the amplifier.

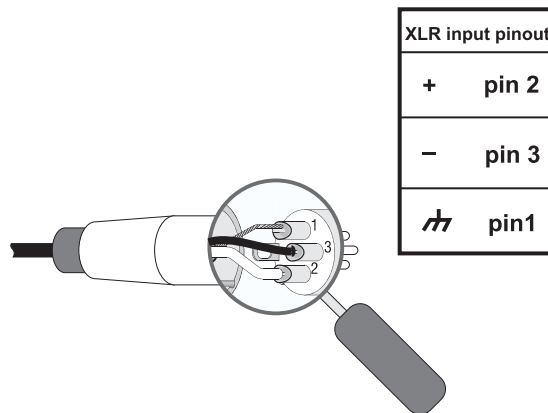
CONNECTIONS: INPUTS

INPUTS

Each channel has active balanced "Euro-style" terminal block and XLR jacks wired in parallel. The input impedance is 12 kOhm balanced or 6 kOhm unbalanced. Each channel's input jacks are wired in parallel. Unused input jacks may be daisy-chained to additional amplifiers if desired.

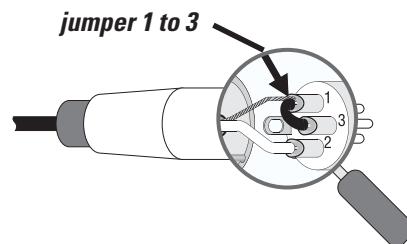
Balanced connection is recommended. Balanced signals are less prone to AC hum, but unbalanced signals can be suitable for short cable runs. The signal source's output impedance should be less than 600 Ohms to avoid high frequency loss in long cables.

Balanced inputs: Use the XLR or the detachable terminal blocks. Proper connection for balanced input options are shown at right.

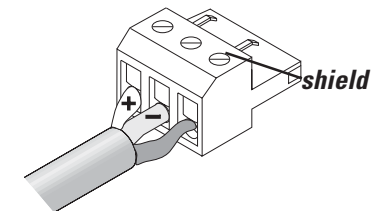


XLR connection • Balanced • Symétrique • Symmetrisch • Balanceado

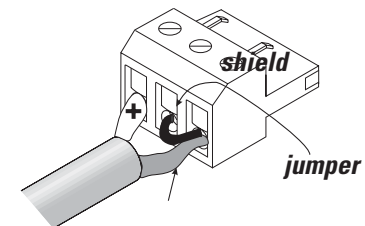
Unbalanced inputs: Connect the unused side of the balanced input to ground, as shown in the illustrations for unbalanced connections, right.



XLR unbalanced • XLR asymétrique • unsymmetrische XLR • XLR no balanceado



Terminal block balanced • bloc détachable symétrique • symmetrische Anschlußstecker • Entrada de bloque balanceado



Terminal block unbalanced • bloc détachable asymétrique • unsymmetrische Anschlußstecker • Entrada de bloque no balanceado

CONNECTIONS: OUTPUTS

OUTPUTS: PL2A amplifiers offer a choice of output connections; Neutrik NL4MD Speakon jacks and "touch-proof" binding post outputs.

SPEAKER CABLING: Always use the largest wire size and shortest length of wire practical for any given installation. Larger wire sizes and shorter lengths minimize power loss and degradation of damping factor. *Do not place speaker cables next to input wiring.*



BRIDGED-MONO PRECAUTIONS:

Do Not Use 2 Ohm Loads in Bridge Mono Mode! 4 Ohms is the minimum impedance for bridge mono operation!

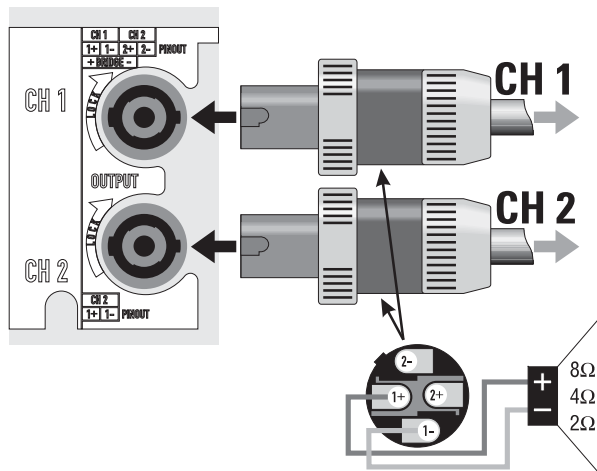
This mode puts a high demand on the amplifier and speaker. Excessive clipping may cause protective muting or speaker damage. Ensure the speaker has a sufficient power rating.



Output voltages greater than 100 volts rms are available between the amplifier's bridged terminals. CLASS 3 wiring methods, as specified in accordance with national (NEC) and local codes, must be used to connect the speaker. To prevent electric shock, do not operate the amplifier with any conductors of the speaker cable exposed.

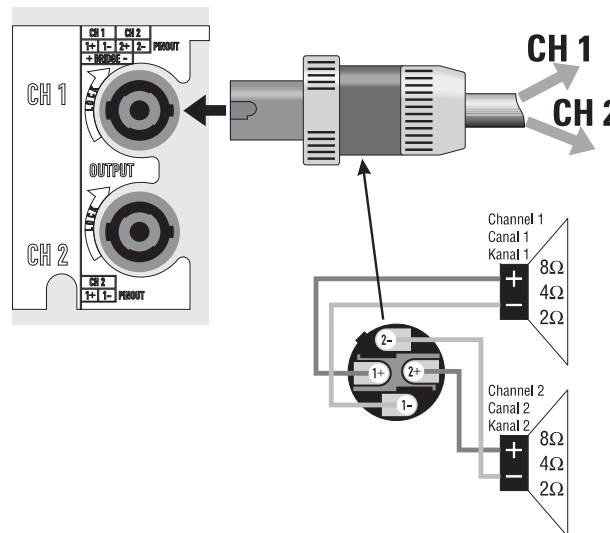
Speakon™ Outputs: The Speakon connector is designed specially for high-power speaker connections. It locks in place, prevents shock hazard, and assures the correct polarity. For easier insertion, use the newer-style NL4FC Speakon connectors with quick lock thumb latches.

The upper Speakon jack (CH1) has both Channel 1 and Channel 2 outputs, so it is especially useful for parallel, bi-amp, or bridged mono operation. The other Speakon carries only Channel 2's output. See the illustrations below.



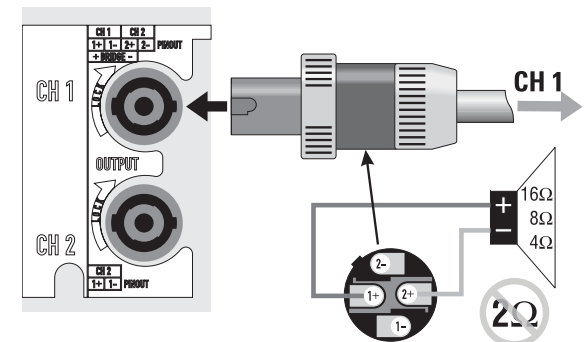
2 channels/canaux/Kanäle/canales & 2 Speakons

(Stereo, bi-amp, or parallel mode; Modes stéréo, bi-amp ou parallèle; Stereo-, Bi-amp- oder Parallelbetrieb; Modos estéreo, bi-amp o paralelo)



2 channels/canaux/Kanäle/canales & 1 Speakon

(Stereo, bi-amp, or parallel mode; Modes stéréo, bi-amp ou parallèle; Stereo-, Bi-Amp- oder Parallelbetrieb; Modos estéreo, bi-amp o paralelo)



Bridged mono • Mono ponté • Monobrückenbetrieb • Mono puente

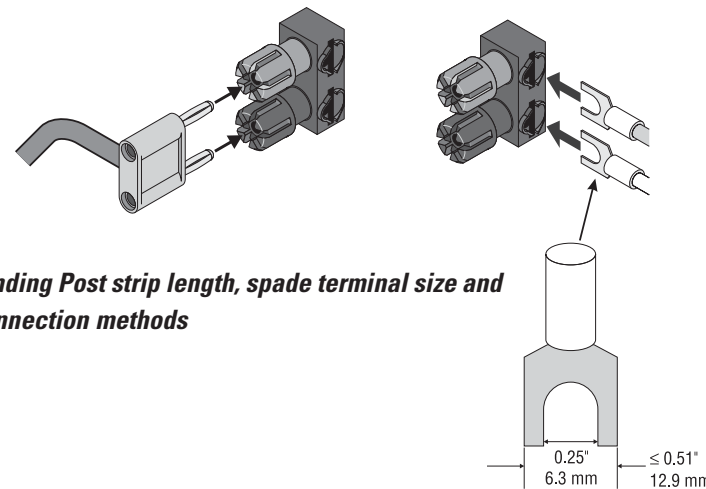
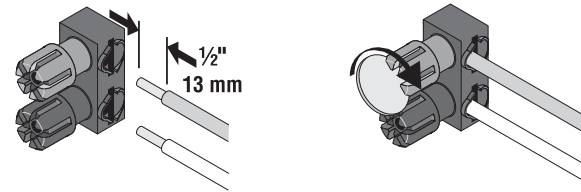
CONNECTIONS: OUTPUTS

Binding post outputs

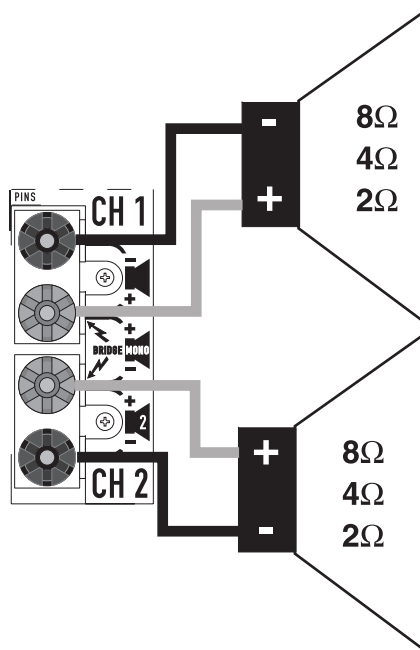
Three connection methods may be used to connect to the binding post output terminals:

- wire inserted from the side then the retaining nut is tightened
- spade terminal inserted from the side then the knurled retaining nut is tightened
- banana plug inserted into the post

Banana plug capability is provided on non-European models ONLY!

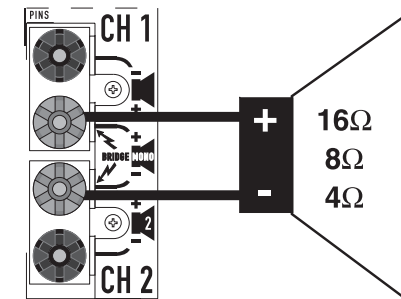


Binding Post strip length, spade terminal size and connection methods



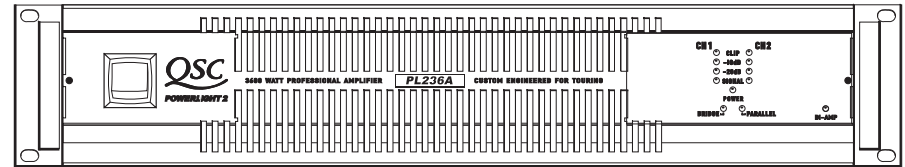
*Stereo, bi-amp, or parallel mode
Modes stéréo, bi-amp ou parallèle
Stereo-, Bi-amp- oder Parallelbetrieb
Modos estéreo, bi-amp o paralelo*

*Bridged mono • Mono ponté •
Monobrückenbetrieb • Mono puente*



SECURITY PANEL USE & INSTALLATION

Right: a POWERLIGHT 2A amplifier with security panel installed
A droite: le panneau avant avec plaquette protectrice installée
Rechts: ein POWERLIGHT 2A-Verstärker mit Sicherheitsabdeckung
Derecha: un amplificador PL2 Acon el panel de seguridad instalado



SECURITY PANEL

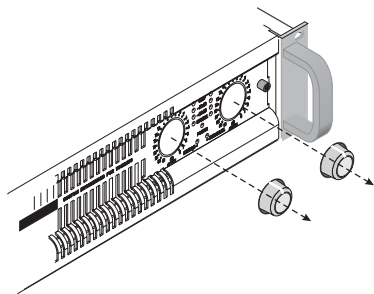
After setting the gain controls, you can install the security panel to prevent tampering and accidental misadjustment. After the knobs have been removed and the gain setting checked, install the security panel as shown in the general illustration to the left and on next page.



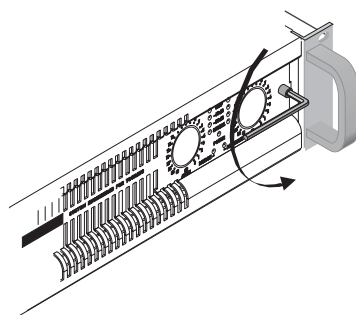
NOTE: The PL2A security panel has a viewing hole for the blue BI-AMP LED. DO NOT USE the PL2 security panel as it has no BI-AMP LED hole. The use of the incorrect security panel may result in damage to the BI-AMP LED. Ensure PL2A security panels are used with PL2A amplifiers.

INSTALLING THE SECURITY PANEL

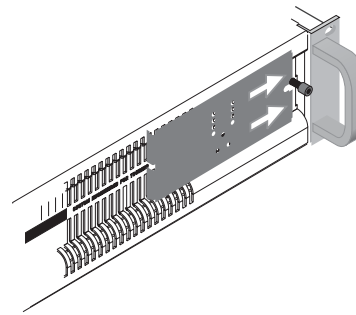
1. Remove the gain control knobs. Do not pry on the knob as damage to the gain control could result.
2. Use a 9/64" or 3.5 mm hex key to loosen the screw.
3. Slide the right end of the security panel under the screw head.
4. Insert the tabs into the keyed portion of the ventilation slots, then slide the panel to the right so it locks in the slot.
5. Align the right end of the security panel with the chassis openings; tighten the screw to secure the panel. Do not over tighten.



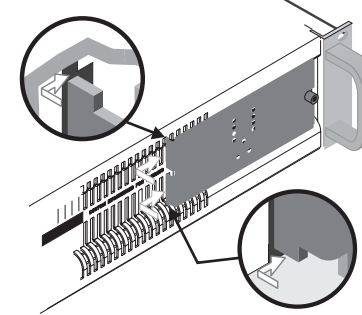
Step 1



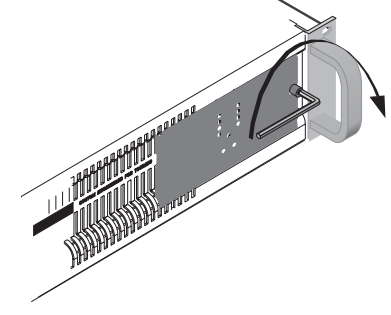
Step 2



Step 3



Step 4



Step 5

REMOVING THE SECURITY PANEL

1. Use an angle 9/64" or 3.5 mm hex key to loosen the screw.
2. Use a small flat screwdriver to lift the right end of the security panel so that its tabs are free of the slots in the front panel.
3. Slide the security panel to the left until you can lift the left end free; slide the panel to the left to remove it from behind the screw.
4. Reinstall the gain control knobs by aligning the flat spot on the control shaft with the flat spot on the knob's shaft opening and pushing the knob firmly onto the shaft.

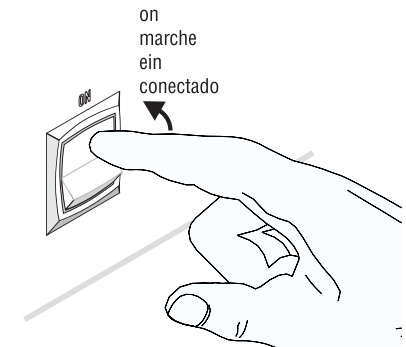
OPERATION

GAIN CONTROLS

Turn down the gain controls before applying power. The gain controls are detented 21 steps for repeatable adjustment. Surrounding the gain control knob, the attenuation level is shown in dB. The gain structure may be selected on the PL2A. On the rear panel you will find a switch labeled **GAIN-SENSITIVITY SELECT**; you may select from +4 dB input sensitivity, 32 dB or 26 dB of voltage gain.

AC POWER SWITCH

Before applying power, check all connections and turn down the gain controls. The "soft start" sequence starts with the **POWER** indicator LED at half brightness. A few seconds later the fan starts, the **POWER** indicator fully illuminates and the amplifier mutes for two seconds. The **CLIP** LEDs will glow bright red. When the **CLIP** LEDs go out, the amplifier is ready.



FRONT PANEL LED INDICATORS

At full brightness, the green **POWER** LED indicates that the amplifier is operating. Half brightness indicates the amp is in its start-up sequence or **STANDBY** mode.

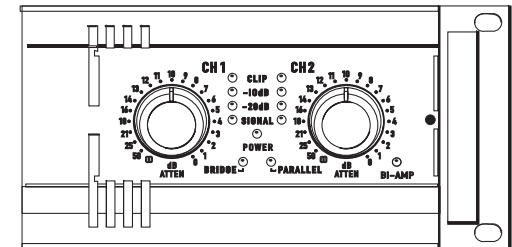
As the input signal strength increases, the green **SIGNAL**, **-20dB**, and amber **-10dB** LED indicators light respectively at 0.1%, 1% and 10% of full power.

The red **CLIP** LED indicator flashes during overload (clipping). A bright, steady glow indicates protective muting; if this occurs during use, see Troubleshooting.

The yellow **BRIDGE** LED illuminates when the **MODE** switch is set to **BRIDGE**.

The blue **BI-AMP** LED illuminates when the **MODE** switch is set to **BI-AMP**.

The orange **PARALLEL** LED illuminates when the **INPUT CONFIGURATION** switch is set to **PARALLEL**.



Front panel: gain controls and indicator LED's for signal level, clip indication, power status indication, and operating mode (bridge, parallel, bi-amp)

NORMAL OPERATING LEVELS

The amp's protective muting system guards against excessive internal temperatures. With normal ventilation and 4 to 8 ohm loads, the amplifier will handle any signal level including overdrive. Lower load impedances and higher signal levels produce more internal heating. When using 2 ohm loads, frequent or prolonged clipping may trigger power cutback or protective muting.

BRIDGE mode doubles the output impedance of the amp; 4 ohms is the minimum load impedance. Heavy clipping may cause muting. If this happens, see Troubleshooting section.

TROUBLESHOOTING: NO SOUND

Problem: NO SOUND

• INDICATION: POWER INDICATOR NOT LIT

- Check the AC plug.
- Confirm that the AC outlet works by plugging in another device. If too many amplifiers are used on one outlet, the building's circuit breaker may trip and shut off power.
- An overload in *bridge* mode may cause the amplifier to click off for three seconds, indicated by the half-bright **POWER** LED, followed by a normal restart cycle. Check the load impedance (4 ohms minimum), or reduce signal level.
- An amplifier which keeps shutting off may have a serious internal fault. Turn it off, remove AC power, and have the amplifier serviced by a qualified technician.

• INDICATION: SIGNAL LED NOT LIT

- Ensure that the **DATAPORT INPUT SIGNAL** switch is in the proper position. If you are using the XLR or terminal block inputs, it should be in the **OFF** position. If you are using the DATAPORT for your input signal, the switch should be set to **PRE PROC** or **POST PROC**.
- If the green **POWER** indicator LED is at full brightness, yet the signal LEDs indicate no signal, check the input. Make sure the signal source is operating and try another input cable. Connect the source to another channel or amplifier to confirm its operation.

• INDICATION: SIGNAL LEDS RESPONDING TO SIGNAL LEVEL

- If the green **SIGNAL**, **-20 dB**, and **-10 dB** indicators are lighting normally, the fault is somewhere between the amp and the speaker. Check the speaker wiring for breaks. Try another speaker and cable.

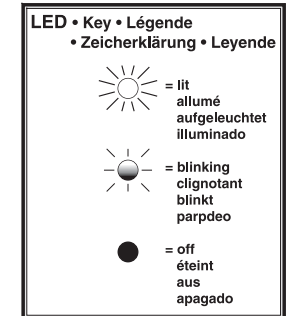
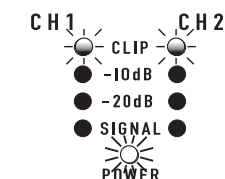
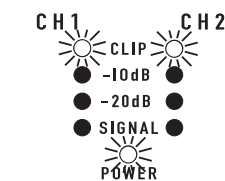
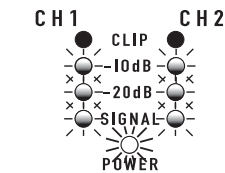
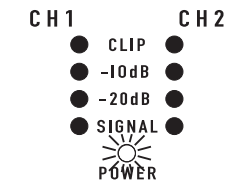
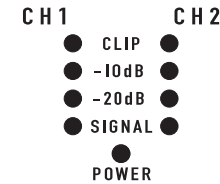
• INDICATION: CLIP LEDS BRIGHT AND STEADY

The amplifier is in protective muting.

- One second of muting is normal when the amp is turned on or off.
- Overheating will cause protective muting. The fan will be running at full speed and the chassis will be hot to the touch; sound should resume within a minute as the amplifier cools to a safe operating temperature. Check for proper ventilation. If the fan isn't running at all, the amplifier requires servicing.

• INDICATION: CLIP LED FLASHING

- If the red **CLIP** indicator flashes when signal is applied, the amplifier output may be shorted. Check the speaker wiring for stray strands or breaks in the insulation.



TROUBLESHOOTING: DISTORTION, NO CHANNEL SEPARATION, HUM, HISS, FEEDBACK

PROBLEM: DISTORTED SOUND

• INDICATION: CLIP LED FLASHING

- If the red **CLIP** indicator flashes before all three signal indicators do, the load impedance is abnormally low or shorted. Unplug each speaker one-by-one *at the amplifier*. If the **CLIP** LED goes out when you disconnect a cable, that cable or speaker is shorted. Try another cable and speaker to locate the fault.

• INDICATION: CLIP INDICATOR NOT FLASHING

- This could be caused by a faulty speaker or loose connection. Check the wiring and try another speaker.
- The signal source may be clipping. Keep the amplifier gain controls at least halfway up so that the source does not have to be overdriven.

PROBLEM: NO CHANNEL SEPARATION

- Check the yellow **PARALLEL** or orange **BRIDGE MONO** LEDs on the front panel, which indicate the switch settings on the back of the amplifier. Neither should be lit in dual-channel, bi-amp, or stereo use where different signals go to each channel. Make sure the "Parallel Input" and "Bridge Mode" switches are *OFF*.
- Make sure other equipment in the signal path, such as mixers, preamps, etc., is set for stereo, not mono.

PROBLEM: CH 1 IS ALL LOW FREQUENCY MATERIAL & CH 2 IS ALL HIGH FREQUENCY MATERIAL

- Check that the **BI-AMP** LED on the front panel is not illuminated. If it is, the **MODE** switch on the rear panel is in the **BI-AMP** position. Move the MODE switch to the 2 CH position. This assumes you do not want to be in BI-AMP mode and that you are operating in a 2 channel mode.

PROBLEM: HISS

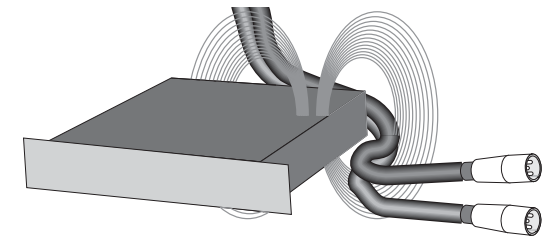
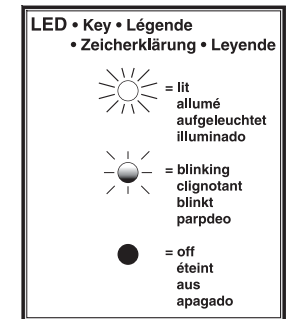
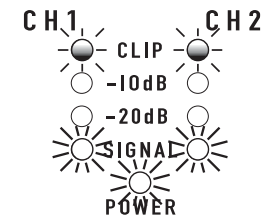
- Unplug the amplifier input to confirm that the hiss is coming from the source or a device upstream; erratic or popping noises indicate an electronic fault in the offending unit.
- To keep the normal noise floor low, operate the primary signal source at full level, without clipping, and avoid boosting the signal further between the source and the amplifier.

PROBLEM: SQUEALS AND FEEDBACK

- Microphone feedback should be controlled with mixer controls. If noise continues to build up with zero mic gain, there is a serious fault in the signal processors or cables. Working in succession from the signal source towards the amplifier, check each device in the signal path by reducing its gain or unplugging it.

PROBLEM: HUM

- The PowerLight™ supply eliminates internal hum fields, but transformers in other magnetic devices may cause hum. Move cabling and signal sources to identify "hot spots" in the system; then avoid those spots. Cables with faulty shielding are a common entry point for hum. Use top quality cabling.



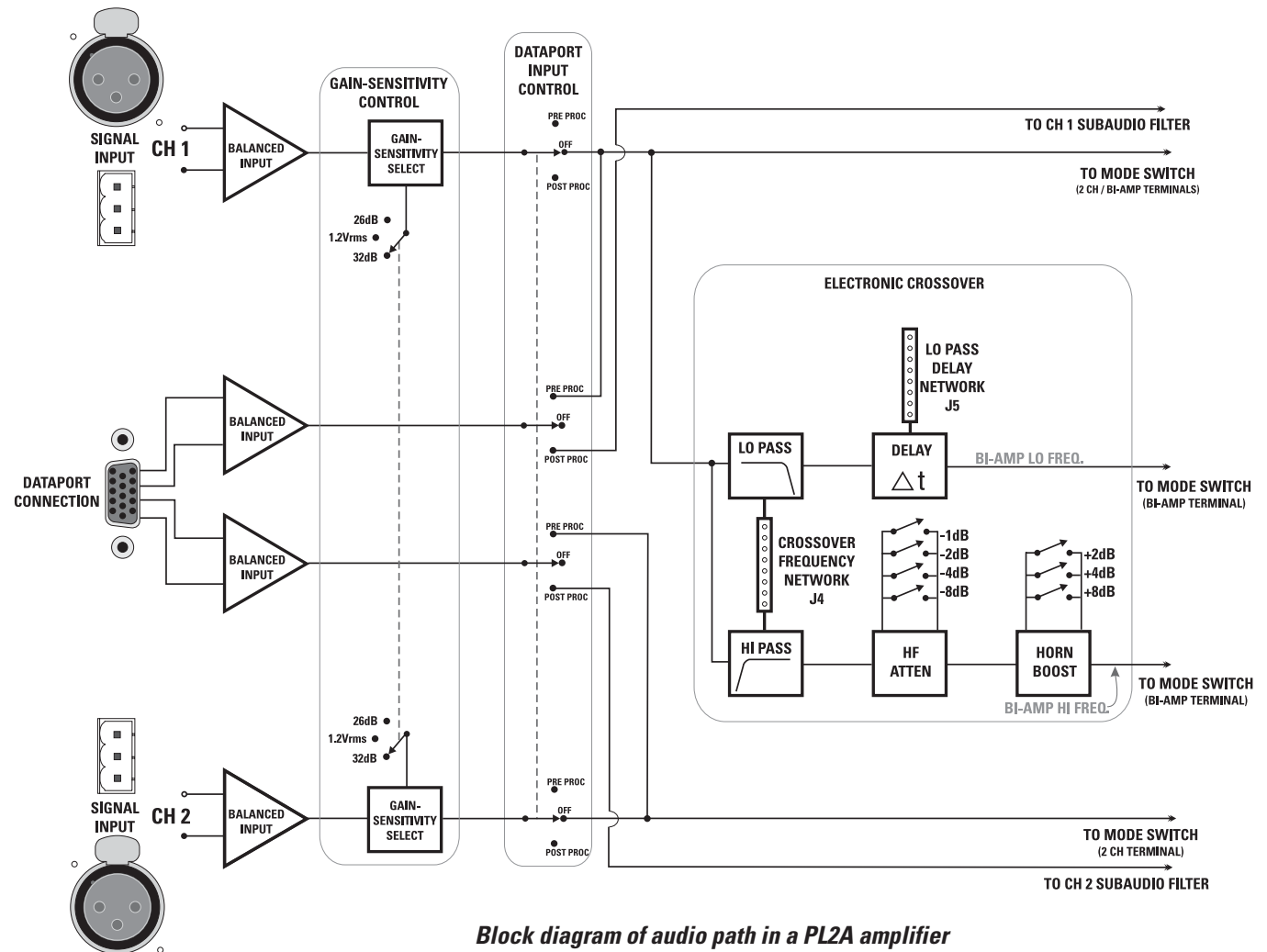
Magnetic field from power supplies in equipment can induce hum into cabling that is located in the field. If hum is a problem, try relocating cabling so that is away from power supplies, transformers and other magnetic field producing devices.

TECHNICAL OVERVIEW: BLOCK DIAGRAM & OPERATIONAL DETAILS

An impressive amount of technology is packed "under the hood" of a PL2A amplifier. Thousands of watts of power flow inches away from state-of-the-art low noise inputs. Precise circuit layout and thorough protection assure that all of this activity occurs smoothly and safely. So, what actually happens when you turn on the power switch?

Soft Start Sequence. The first task is to charge the primary energy reservoir without drawing a large surge current. A special inrush limiter allows just enough current to charge the energy bank in three seconds. Meanwhile, a low-power switching supply provides power to start up the main supply. After three seconds, a relay bypasses the inrush limiting and full power operation is enabled. The audio circuitry mutes for one second to eliminate start-up thumps. When the red **CLIP** lights go out, the amplifier is ready for action.

PowerLight™ Technology. High current switching devices draw over 10,000 watts of peak power from the main energy reservoir, which is replenished directly from the AC line for maximum stiffness. Conventional amplifiers must isolate the energy bank with a large AC transformer, which weakens the flow of current, allows greater sag under load, and produces hum. The PowerLight supply performs voltage conversion at a very high frequency, allowing better coupling through a much smaller isolation transformer.



Block diagram of audio path in a PL2A amplifier

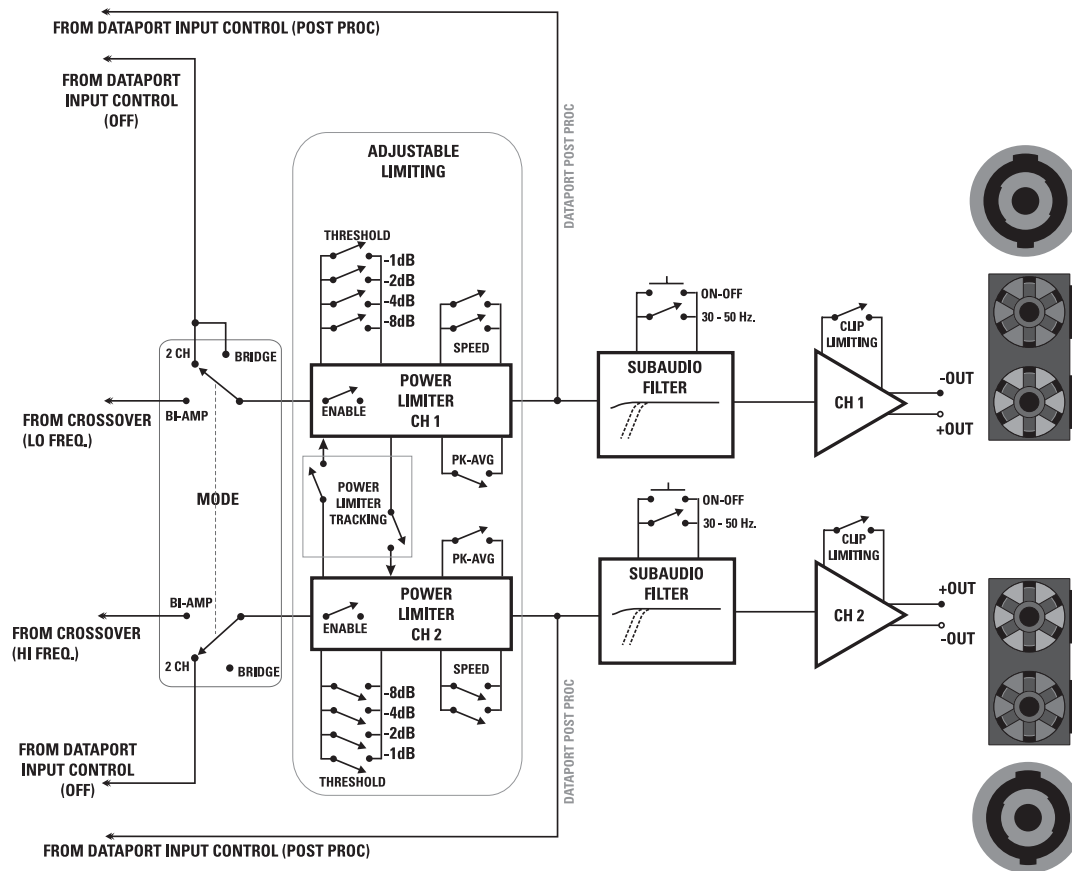
TECHNICAL OVERVIEW: BLOCK DIAGRAM & OPERATIONAL DETAILS

High Performance Audio. High speed power transistors convert this DC power into the full range audio output which drives the speakers. High-current design and special dual-sense output feedback corrects errors on both sides of the speaker terminals, improving damping and control of speaker motion. The power devices are directly mounted to isolated heat sinks, which form a short, wide air tunnel in front of the fan for optimum cooling.

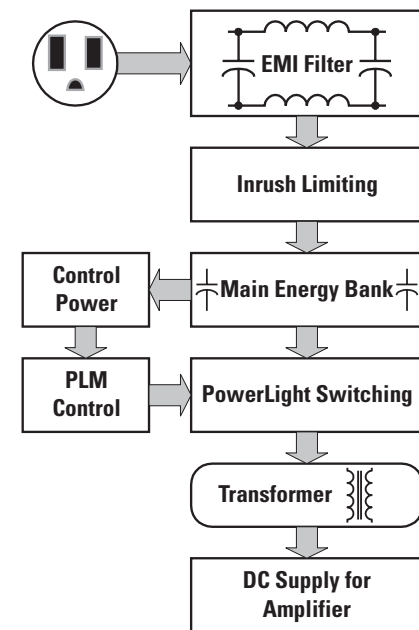
Each channel has a thermal sensor embedded in its heat sink for accurate temperature monitoring. The sensor controls fan speed, bias tracking and thermal shutdown. It also reports temperature readings to the DataPort (for remote monitoring with QSC's CM16a Processor).

The output circuitry is actively clamped during clipping for smooth and very fast recovery. The clamp also feeds a proportional clip limiter, which actually senses the depth of clipping and responds accordingly.

The balanced inputs use premium 0.1% precision resistors for very high noise rejection. The precision components used in the input filters and all other circuitry ensure accurate performance.



Shutdown. The amplifier mutes as soon as power is shut off, preventing turn-off noises. Serious faults trigger a shutdown of the power supply; the high switching frequency allows the power supply to shut down within microseconds to limit damage.



Basic functional block diagram of PowerLight™ power supply

SPECIFICATIONS

| | PL218A | PL224A | PL230A | PL236A | |
|---|---|--|--|--|--|
| OUTPUT POWER <i>in watts</i> | | | | | |
| <i>FTC:</i> | 8 ohms per channel (20-20k Hz., 0.05% THD) 4 ohms per channel (20-20k Hz., 0.07% THD) | 310 525 | 440 715 | 575 900 | 725 1100 |
| <i>EIA: 1 kHz</i> | 8 ohms per channel | 350 | 475 | 625 | 800 |
| <i>@1% THD</i> | 4 ohms per channel | 600 | 825 | 1050 | 1300 |
| | 2 ohms per channel | 900 | 1200 | 1500 | 1850 |
| <i>Bridged Mono:</i> | 16 ohms, 20–20k Hz, 0.1% THD | 650 | 900 | 1200 | 1500 |
| | 8 ohms, 20–20k Hz, 0.1% THD | 1100 | 1500 | 2000 | 2400 |
| | 4 ohms, 1 kHz, 1% THD | 1800 | 2400 | 3000 | 3600 |
| DYNAMIC HEADROOM (all models) | less than 2 dB at 4 ohms | | | | |
| DISTORTION (all models) | Less than 0.01% | | | | |
| | SMPTE-IM | <0.025% | | | |
| | Typical, 10 dB below rated power, 20-20k Hz. | <0.025% | | | |
| | Typical, full rated power, 1k Hz. and below | <0.025% | | | |
| FREQUENCY RESPONSE (all models) (at 10 dB below rated output power) | 20 Hz to 20 kHz, ±0.2 dB -3 dB points: 8 Hz and 65 kHz | | | | |
| DAMPING FACTOR (all models) | Greater than 500 | | | | |
| SIGNAL to NOISE (unweighted, 20-20k Hz.) | -103 dB | -103 dB | -103 dB | -103 dB | |
| VOLTAGE GAIN | Selectable from 26dB or 32 dB voltage gain (or a 1.2 Vrms input sensitivity) by the GAIN-SENSITIVITY SELECT switch | | | | |
| INPUT SENSITIVITY, V_{RMS} | switch position | 26dB 1.2Vrms 32dB | 26dB 1.2Vrms 32dB | 26dB 1.2Vrms 32dB | 26dB 1.2Vrms 32dB |
| | for rated power into 8 ohms | 2.57 1.28 1.28 | 3.05 1.20 1.53 | 3.84 1.22 1.93 | 3.95 1.24 1.98 |
| | for rated power into 4 ohms | 2.37 1.18 1.18 | 2.97 1.10 1.39 | 3.41 1.08 1.71 | 3.45 1.09 1.73 |
| INPUT CLIPPING, V_{RMS} (all models) | +22dBu | | | | |
| INPUT IMPEDANCE (all models) | 6k ohms unbalanced 12k ohms balanced | | | | |
| CONTROLS (all models) | <p>Front: AC switch, CH 1 and CH 2 gain knobs</p> <p>Back: Slide switches with LED confirmation for: Input Configuration, Mode, DataPort Input Signal assignment and Gain-Sensitivity Select</p> <p>Side: SIP networks for crossover frequency and low frequency delay; push-button toggle switch for Subaudio Filter; DIP switches for Subaudio Frequency select, Lo Frequency delay enable/off, HF Attenuation 0 to -15 db adjust, Horn Boost 0 to +14 dB adjust. "Per Channel" switches: Power Limiter enable/off, Power Limiter Mode peak/average, Power Limiter Threshold 0 to -15dB adjust, Power Limiter attack & release time fast-medium-slow, Power Limiter tracking none/bi-amp (CH 2 tracks CH 1)/"reverse" bi-amp (CH 1 tracks CH 2)/stereo (each channel tracks the other), and Clip Limiting on/off</p> | | | | |

SPECIFICATIONS

| | PL218A | PL224A | PL230A | PL236A |
|--|---|----------------|----------------|----------------|
| INDICATORS (all models) | Front: POWER: Green LED, STANDBY: POWER LED 1/2 brightness, BRIDGED: Yellow LED, PARALLEL: Orange LED, BI-AMP: Blue LED, CLIP/Protect: Red LED, 1 per channel, Level -10 dB: Orange LED, 1 per channel, Level -20 dB: Green LED, 1 per channel, SIGNAL -35dB: Green LED, 1 per channel Back: STEREO: Green LED, PARALLEL: Orange LED, BI-AMP: Blue LED, 2 CH: Green LED, BRIDGE: Yellow LED, DATAPORT PRE PROC: Blue LED, DATAPORT OFF: Green LED, DATAPORT POST PROC: Yellow LED, GAIN-SENSITIVITY SELECT: 26dB Orange LED, 1.2Vrms Green LED, 32dB Yellow LED Side: SUBAUDIO FILTER: Green LED is on when filter is engaged (1 per channel), POWER LIMITER ACTIVITY LED: Yellow LED flashes when limiter is active (1 per channel) | | | |
| CONNECTORS (all models) | Input: 3-pin rubber-isolated XLR (pin 1, earth; pin 2, +; pin 3, -) and 3-pin detachable terminal block (pin out labeled) Output: "Touch-Proof" binding posts and Neutrik® Speakon connectors; Speakon for CH 1 can be used for one or both channels and for bridged mono | | | |
| COOLING (all models) | Continuously variable speed fan, back-to-front air flow, provision for optional air filter | | | |
| AMPLIFIER PROTECTION (all models) | Full short circuit, open circuit, thermal, ultrasonic, and RF protection Stable into reactive or mismatched loads | | | |
| LOAD PROTECTION (all models) | Turn-on/turn-off muting, DC-fault power supply shutdown, clip limiting, power limiting | | | |
| OUTPUT CIRCUIT TYPE | AB | 2-step Class H | 2-step Class-H | 2-step Class-H |
| POWER REQUIREMENTS (all models) | 120 Volts AC, 50/60 Hz | | | |
| POWER CONSUMPTION @ 120 VAC, typical (both channels driven) | | | | |
| Idle | 1 A | 1 A | 1 A | 1 A |
| 1/8 power, 8 ohms* | 5 A | 5 A | 6 A | 7 A |
| 1/8 power, 4 ohms* | 8 A | 8 A | 9 A | 10 A |
| 1/8 power, 2 ohms* | 12 A | 11 A | 13 A | 17 A |
| <i>NOTE: 1/8 power is representative of current draw with typical music program material with occasional clipping. *Pink noise</i> | | | | |
| DIMENSIONS (all models) | 19.0" (48.3 cm) wide, 3.5" (8.9 cm) tall (2 rack spaces) 14.0" (35.6 cm) deep (from front mounting rails) including rear support ears | | | |
| WEIGHT (all models) | Shipping: 27 lb. (12.3 kg) Net: 21 lb. (9.5 kg) | | | |

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

US Patent Number 5767744

WARRANTY INFORMATION & HOW TO CONTACT QSC AUDIO PRODUCTS

WARRANTY

(USA only; other countries, see your dealer or distributor)

Disclaimer

QSC Audio Products, Inc. is not liable for any damage to speakers, amplifiers, or any other equipment that is caused by negligence or improper installation and/or use of the PL2A amplifier.

Product Warranty

QSC guarantees the PL2A to be free from defective material and/or workmanship for a period of three years from the date of sale, and will replace defective parts and repair malfunctioning products under this warranty when the defect occurs under normal installation and use—provided the unit is returned to our factory via prepaid transportation with a copy of the proof of purchase, i.e., sales receipt. This warranty provides that examination of the returned product must indicate, in our judgment, a manufacturing defect. This warranty does not extend to any product which has been subjected to misuse, neglect, accident, improper installation, or where the date code has been removed or defaced.

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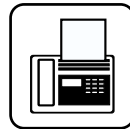
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