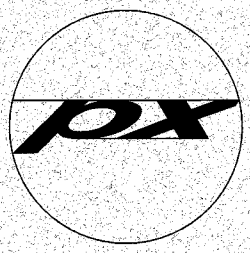
px/a amplifier/digital crossover system

owners manual

a/d/s/



analog and digital systems

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introduction

Thank you for choosing the a/d/s/ ***px***/a amplifier. Your new ***px***/a is the latest in a line of innovative car audio products which began back in 1974 with the introduction of the first car system (model #2001) to use a switch-mode power supply; the technology which makes today's high power car amplifiers possible. Your new ***px***/a incorporates technology that is as advanced by today's standards as that a/d/s/ 2001 system was in 1974. From the flexible built-in crossover functions to the Multiple Independent "Quasi-Resonant Mode" power supplies and sophisticated ServoBias BiMos circuit design, each part of your new a/d/s/ ***px***/a is specifically selected to deliver the most from all types of music. Whether asked to deliver the power of the most outrageous Synth-Bass or the subtle nuance of a violin, the technology of your a/d/s/ ***px***/a is focused toward one goal - to deliver the "sound as it should to be".

the ***px***/a story

In 1997, a/d/s/ introduced the 335***px*** component speaker system to worldwide acclaim. Until then, no company had the creativity or resources to bring such a speaker to market. The 335***px*** featured no-holds barred construction, unequalled performance, and a price no-object attitude. The quality and construction justified its value.

Today, the ***px*** line has expanded to include a new larger component system, the 336***px***, the ultra low distortion 310***px*** subwoofer and the flagship ***px***/a amplifier. All of these products are built the way we would build them for ourselves. The parts and construction used are all focused on one goal, the ultimate performance. The technology of ***px*** may not be appropriate in mainstream products, but when you want the "best" there is no substitute.

A team led by noted audiophile engineer Ed Meitner along with design engineer Zan Muzyka and digital wizard Campbell Kelly designed the ***px***/a. These three engineers have been responsible for some of the most highly regarded audiophile designs in history including the original IDAT D/A converter. Their legacy includes the optimization of noise-free electronic switching, the first remote level control circuit to achieve acceptance in the high-end community, and the discovery and quantification of digital jitter and Logic Induced Modulation. This experience led directly to the technology used in development of the ***px***/a.

The first clue that the ***px***/a is different is it's central control panel, which is entirely devoid of the usual level controls and crossover frequency adjustments. In their place are two displays and a series of pushbuttons. The signal routing and crossover functions are completely under digital control. From the time the signal enters the amplifier to the time it exits the signal never encounters a mechanical switch or potentiometer. This completely avoids the signal degradation of switch contacts, and guarantees more accurate channel balance than is possible with level potentiometers. We achieve this by instantly converting the incoming analog audio signal to an oversampled digital bit-stream. Digital Signal Processing is used to mathematically alter the signal as needed to set individual channel levels and to create the desired crossover curves. The ***px***/a incorporates the latest 32-bit floating-point SHARC (**S**uper **H**arvard **AR**chitecture **C**omputer) processor technology, which endows it with unsurpassed signal-path resolution and extreme crossover accuracy.

A proprietary solid state signal routing matrix is entwined with the DSP and control circuitry to properly route the incoming signal as needed for each system configuration. Twenty-One system options are provided, which are chosen using the *system select* pushbutton after referring to the system diagrams in the owner's manual. Unlike common switching schemes, the ***px***/a uses a topology where the signal does not pass through the active switch element. This provides extremely clean signal transfer without negative audible side effects.

Once past the DSP stage, the signal is converted back to analog, where it feeds a low-feedback amplifier circuit featuring a/d/s/ patented BiMos output stage and new ServoBias-A system. The ***px***/a design is based on one of the basic rules of audiophile

design: simple signal paths provide the best sound. Very often the need for high power and high current is inconsistent with this philosophy, causing many designers to resort to inherently non-linear amplification stages in order to achieve the high power output required. The ***px***/a does not make this compromise. Instead, Ed Meitner's BiMos design combines a high speed MOSFET and high current Bi-polar transistor in a way that exploits the benefits of both while reducing the disadvantages of each. In particular, the Bi-polar transistors we use are excellent for stable current delivery into difficult loads. However, MOSFETS are easier to drive, resulting in simple, more direct circuitry ahead of the output section. In the ***px***/a, MOSFETs and Bipolar transistors are combined such that the MOSFET is driven by the preceding circuitry, with the Bi-polar transistor following the MOSFET output exactly. The result is that the sonically critical Class-A "gain" stage of the amplifier is simpler and cleaner than could have been achieved with conventional design.

In typical high fidelity amplifiers, a bias voltage is used to keep a current flowing through the output transistors when there is no signal. This reduces distortion by minimizing the "glitch" in the waveform that would otherwise occur when the signal crosses from positive to negative, through zero value. In conventional class A/B amplifier design, the transistor used to conduct the polarity opposite that of the instantaneous value of the waveform shuts off. When it does, a transient distortion appears in the signal waveform. The addition of bias moves this point slightly above or below the point at which the waveform crosses through zero value so that the glitch in the waveform is masked by the signal. More bias results in more distortion masking and therefore a cleaner sound. Maintaining the proper bias has always been a compromise: too little and audible distortion sets in, too much and the amplifier becomes inefficient or overheats. To make matters worse, the mere act of using the amplifier causes it to heat up, which in turn changes the bias level as a result of the temperature coefficient of practical circuits. With most amplifiers, the bias is set conservatively in order to avoid overheating or output failure. This results in more distortion than is ideal, but is necessary for reliability. "Class-A" amplifiers have sufficient bias so that neither transistor ever turns off, eliminating the problem. The problem with Class-A is efficiency, since the high bias results in full power dissipation even when no signal is present. In the ***px***/a, we have eliminated both of these compromises with the use of a new active ServoBias-A circuit. A sophisticated IC in this innovative circuit constantly monitors the output stage bias and keeps it at the optimum level at all times. Like traditional Class-A, ServoBias-A controls each output transistor so that no output transistor ever turns fully off, yet it does this dynamically without the inefficient high static bias levels required by old-fashioned Class-A designs. ServoBias-A totally eliminates the zero-crossing distortion without compromising efficiency or reliability.

At the other end of the power scale, the circuit is designed to clip the waveform at maximum output by softly rounding the waveform tips instead of the abrupt truncation of conventional designs. This gives the ***px***/a a smooth, effortless quality even when it is playing at unusually high power levels.

All of this is powered from one of the most sophisticated power supply designs ever to be used in a mobile amplifier. In the ***px***/a, each output channel has its own isolated secondary transformer winding on one of the five Resonant Mode power supplies. This Resonant Mode design provides exceptional headroom with dramatically reduced radiated noise when compared with ordinary PWM designs. In the resonant mode design, the FET's used to drive the transformer primaries switch at the point on each waveform cycle which is at zero current flow. This eliminates the switching transients inherent to PWM power supply designs. The individual output circuit supplies are augmented with no less than 12 additional local regulators for preamplifier and digital stages. Each critical stage is given it's own regulation in order to provide ideal operating conditions for the amplifying circuitry. AC to DC rectification at the output of each transformer is accomplished with high-speed, low-noise Shottky diodes. These fast rectifiers operate with a fraction of the high frequency noise of conventional diodes. Finally, all of the power supply switching and clock frequencies internal to the amplifier are synchronized to a master clock, which assures that no intermodulation

frequencies are produced which could leak into the signal path. By taking these measures, sonic purity is maintained, eliminating the possibility that a signal present in one portion of the amplifier can contaminate another. In addition, the inherent low noise of this supply design produces less radio frequency interference, which both improves radio reception as well as eliminating a significant source of noise and distortion in the signal path of all sources. This supply is regulated against variations in input voltage, ensuring maximum performance over a wide range of operating conditions.

In a nutshell, the elegant chassis of the ***px***/a houses some of the most advanced circuitry ever to be packaged for automotive use.

about this manual

To get the most from your a/d/s/ ***px***/a, we recommend that you have the installation performed by your qualified authorized a/d/s/ dealer. If your dealer in the USA installs this unit, we will extend the warranty to three-years instead of the standard one-year. However, if you feel that you have the necessary skills and prefer to perform the installation yourself, this manual will guide you through the process of installation and set-up. Please read through it completely before beginning the installation so that you may familiarize yourself with the total procedure before you begin. If there is anything that you do not fully understand, please consult your a/d/s/ dealer before attempting the installation.

warnings and tips

Always disconnect the battery ground wire before doing any work on your vehicle. Reconnect the cable only after the installation is complete and the wiring has been checked to make sure that there are no problems. If your radio features a code type security system be sure to know the code before disconnecting the battery!

Your a/d/s/ ***px***/a should be installed in 12V negative ground vehicles only. Connection to other types of electrical systems may cause damage to the vehicle or the amplifier.

Wear Eye and Ear protection when using power tools.

Before cutting or drilling carefully inspect the area to be sure there are no fuel lines, brake lines, or electrical wiring which could be damaged. Sometimes these components may be hidden between double-walled panels, so be very careful.

Do not bypass or modify the fuses. Do not replace fuse(s) with one of a higher rating. The fuse should not fail under normal operation. Repeated blowing of the fuse(s) indicates a problem with the amplifier or improper installation.

An additional power supply line fuse (not supplied) must be installed on the 12-Volt supply line and located as close as possible (no more than 18") to the battery in order to protect the wire in the event of a short circuit.

Never operate the vehicle without the ***px***/a firmly mounted. An un-mounted amplifier can be a dangerous missile in the event of an accident or abrupt stop.

The ***px***/a should not be mounted where it will be exposed to moisture or extreme heat.

The ***px***/a should be mounted in such a way that air can circulate around the fins. The most efficient cooling is with the ***px***/a mounted vertically with the fins also vertical, or with the ***px***/a mounted flat to the floor. Do not mount the ***px***/a horizontally with the fins pointing downwards.

Make sure the system is turned off when making or breaking any connections.

Do not use your ***px***/a with speakers which have either terminal connected to the speaker frame or to the vehicle chassis.

keep listening, but be safe!

Sustained listening to loud music over 100dB has been shown to cause permanent hearing damage. Systems using a/d/s/ components are capable of achieving volume levels that substantially exceed this level. When operating your system for sustained periods at high volume (for example, during a "sound off" competition), be sure to use hearing protection to prevent long-term exposure. We want you to be able to enjoy the music for many more years.

planning your system

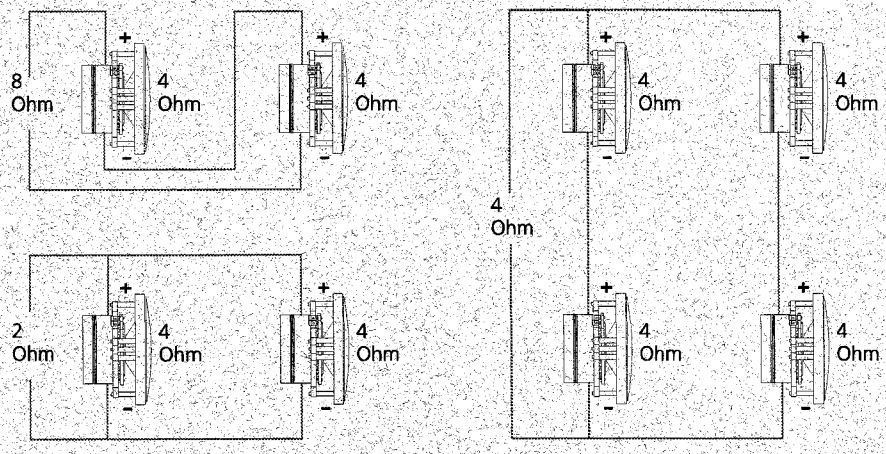
Proper system planning is the best way to maximize performance and reliability. Your authorized a/d/s/ dealer has been trained to know how to maximize your systems sonic potential. They are a valuable resource in helping you with your system design and installation.

speaker requirements

Channels 1 - 6 of your ***px***/a can drive minimum 2-Ohm speaker loads when used in the stereo mode. When a channel-pair is bridged, the recommended minimum load impedance is 3 Ohms for subwoofer use, and 4-Ohms for full-range operation.

Channels 7 and 8 can each drive a minimum 1-Ohm speaker load when used in the stereo mode. When bridged, the recommended minimum load impedance is 1.5 Ohms. Although operation at lower impedance loads is not likely to cause immediate damage to the internal circuitry, the unit will most likely overheat, causing the thermal protection circuitry to activate and shut down the amplifier. When the chassis cools down, normal operation will resume. Continuing to operate the amplifier under these conditions is not recommended and will ultimately reduce its life expectancy.

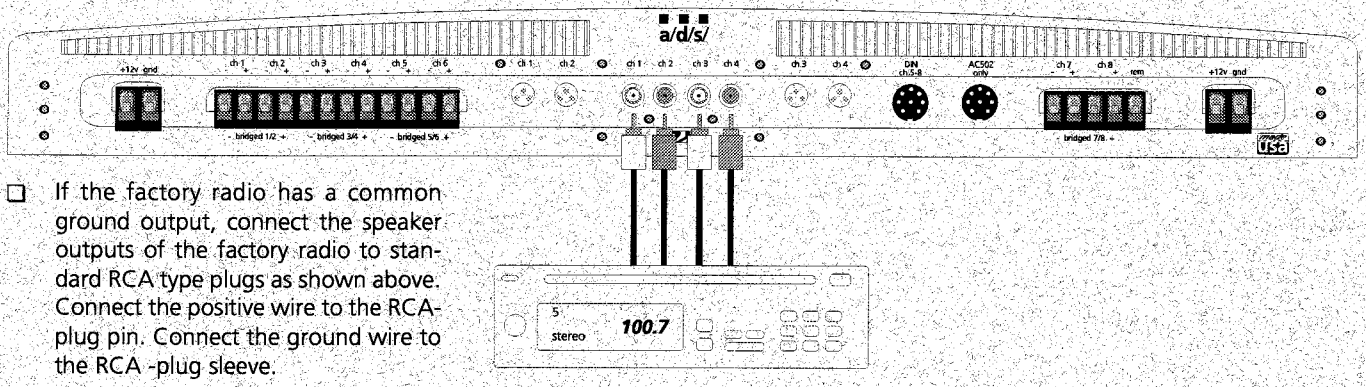
Most speakers designed for car audio operate at a nominal impedance load of 4-Ohms. Connecting two such speakers in parallel will result in a 2-Ohm impedance load as seen by the amplifier. Some a/d/s/ subwoofer models, such as the 310***px*** feature a dual voice coil design. On the 310***px***, each voice coil is nominally rated at 3-Ohms. Connecting these voice coils in parallel will result in a 1.5-Ohm nominal impedance which is safe to use with either stereo or bridged channels 7 & 8 of your ***px***/a. See the 310***px*** manual for more detailed information on the specific wiring of this model.



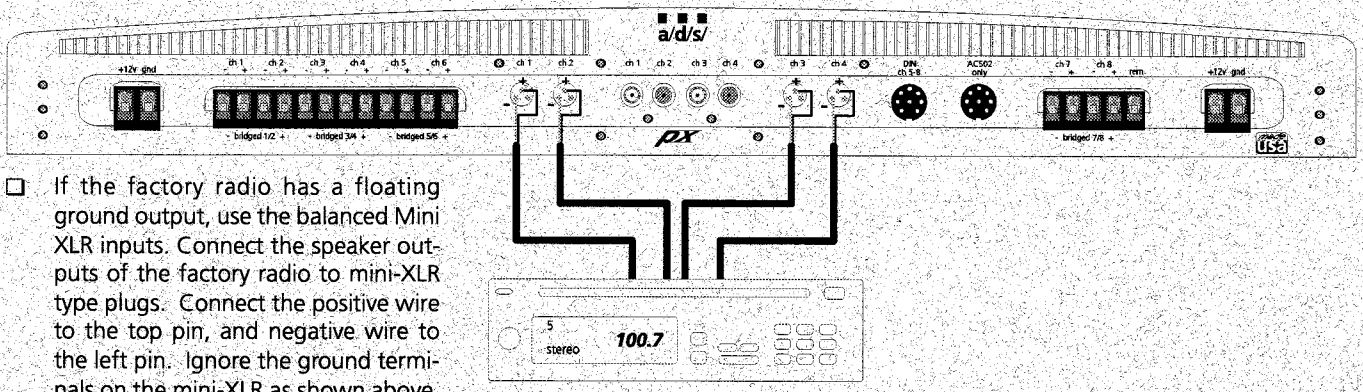
signal sources

Due to its wide input level adjustment range, the a/d/s/ ***px***/a can be driven with either a conventional pre-amplified signal or the amplified signal from a powered source unit. This makes the ***px***/a perfect for upgrading an OEM (Original Equipment Manufacturer) stereo system, while retaining the factory installed radio.

Because of the high impedance of the input stage, the factory radio drives an easy load and therefore does not produce the distortion levels that it normally would when driving either speakers or a line output converter accessory. As a result, you can enjoy high quality sound when using a factory installed radio that is often indistinguishable from the sound of a high-end after-market source unit. This can be accomplished two ways, depending on the factory radio.



- ❑ If the factory radio has a common ground output, connect the speaker outputs of the factory radio to standard RCA type plugs as shown above. Connect the positive wire to the RCA-plug pin. Connect the ground wire to the RCA -plug sleeve.



- ❑ If the factory radio has a floating ground output, use the balanced Mini XLR inputs. Connect the speaker outputs of the factory radio to mini-XLR type plugs. Connect the positive wire to the top pin, and negative wire to the left pin. Ignore the ground terminals on the mini-XLR as shown above.

Note: If you experience low levels or engine noise, connect the ground (right pin) to the vehicle chassis.

From this point on, the signal can be treated exactly as you would a preamp-level signal, except that the input level controls on the ***px***/a will most likely be set to a lower than usual level when you make your final adjustments. In later adjustments, set the ***px***/a's input sensitivity to the 6V range (refer to "system tuning" on pages 24 - 26).

Conventional after-market sources may be connected using either standard shielded RCA cables, or mini-XLR twisted-pair cables from the source unit preamp outputs to the ***px***/a inputs.

system options

The ***px***/a amplifier is equipped with state of the art DSP (Digital Signal Processing) and an advanced solid-state switching matrix allowing one of twenty-one different system configurations to be easily selected. All are created, maintained, and modified in the digital domain.

determining a configuration

Each of the configurations was designed to provide sensible power distribution and useful crossover capabilities when used with a/d/s/ loudspeakers. The other a/d/s/ ***px*** models are the logical companions to the ***px***/a, and will assure outstanding system performance.

Each system configuration is assigned a letter designation from A through G. Some systems also have a number suffix, such as A1 and A2 which describe variations in the way the rear channels are driven. In each case, the default system (letter only) drives the rear channels in an "ambience" mode with an L – R (Left minus Right) difference signal. This is similar to the rear channels in a surround sound system and we feel that it adds spaciousness without detracting from a solid front image. The systems with a "1 " suffix drive the rear speakers in conventional stereo mode. Systems with a "2" suffix drive the rear speakers in mono if preferred. If you choose the ambience mode, we have made provisions to defeat this mode remotely by grounding pin #8 of the input DIN jack. When pin 8 is grounded, the rear channels are driven in conventional stereo mode. The reason for this is that the rear ambience mode can be erratic on weak FM radio signals. This is due to the fact that most FM tuners have a variable high-blend circuit to reduce background noise on weak signals. When this high-blend circuit operates, the rear signals will be reduced in level. Since these blend circuits change with signal strength, you may find that the rear channel signals increase and decrease while driving.

Configuration "U" is a universal configuration. It allows you to access each channel independently without benefit of the ***px***/a signal routing capability. This is useful in troubleshooting, or if you wish to configure a custom system design.

Following are flow charts and descriptions for all twenty-one configurations. Carefully review this section to decide which configuration is best for you.

Please note that the system configurations list crossover functions for each channel. These are recommendations based on the intended function of each system type and may be changed in subsequent programming steps as needed for your specific application.

crossover choices

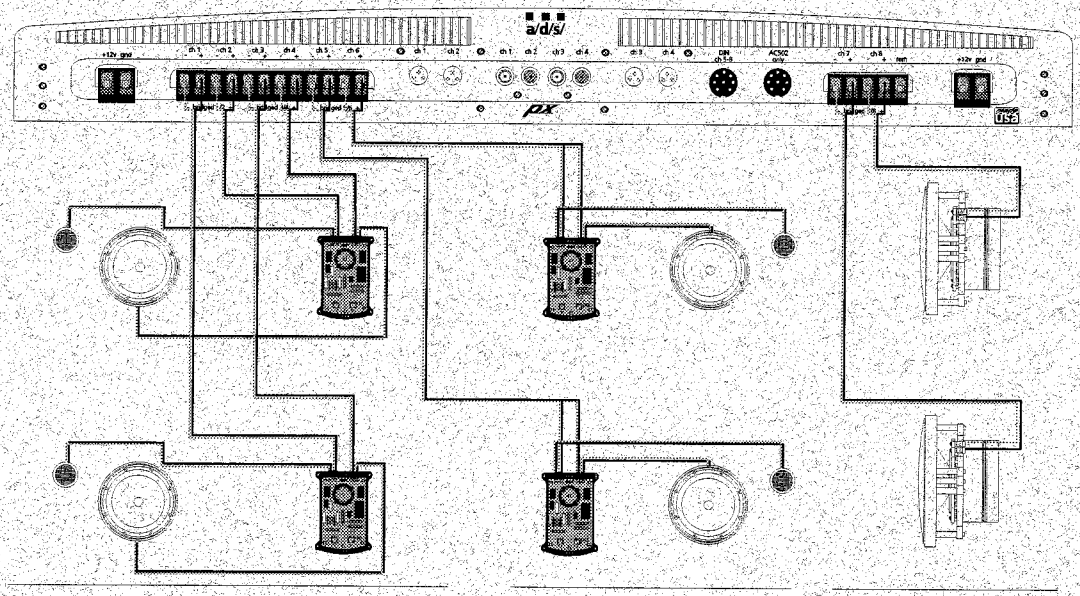
Many of the system configurations offered by the ***px***/a provide the capability of bi-amping the main full-range loudspeakers. When bi-amping a/d/s/ component-loudspeaker systems, you have the choice of using either the ***px***/a active crossover circuitry or the passive crossover supplied with the component system. With a/d/s/ systems, we recommend bypassing the ***px***/a midrange low-pass and tweeter high pass active crossovers and using the passive crossovers matched to the speaker system instead. This will assure that you get the proper frequency response and balanced performance that was engineered into the system. The ***px***/a crossover used for midrange high-pass should still be used to block bass from the midrange driver, since this is not part of the a/d/s/ passive crossover.

If using loudspeakers other than a/d/s/, please use the crossover recommendations of the loudspeaker manufacturer.

subwoofer options

Each of the system configurations give you the choice of running the subwoofer channels in stereo or mono mode. This is selected independently of the system letter, and is described later in the setup section.

In addition, all systems have provisions to add the optional AC502 remote bass level control to provide subwoofer level adjustment from the listening position.



system configuration - a

system a - (front channels bi-amped/rear channels full-range "ambience"/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left tweeter
2	<	2	75W	hp	front right tweeter
3	<	1	75W	band-pass	front left midrange
4	<	2	75W	band-pass	front right midrange
5	<	3 - 4	25W	hp	rear left ambience
6	<	3 - 4	25W	hp	rear right ambience
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: Channels 5 & 6 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

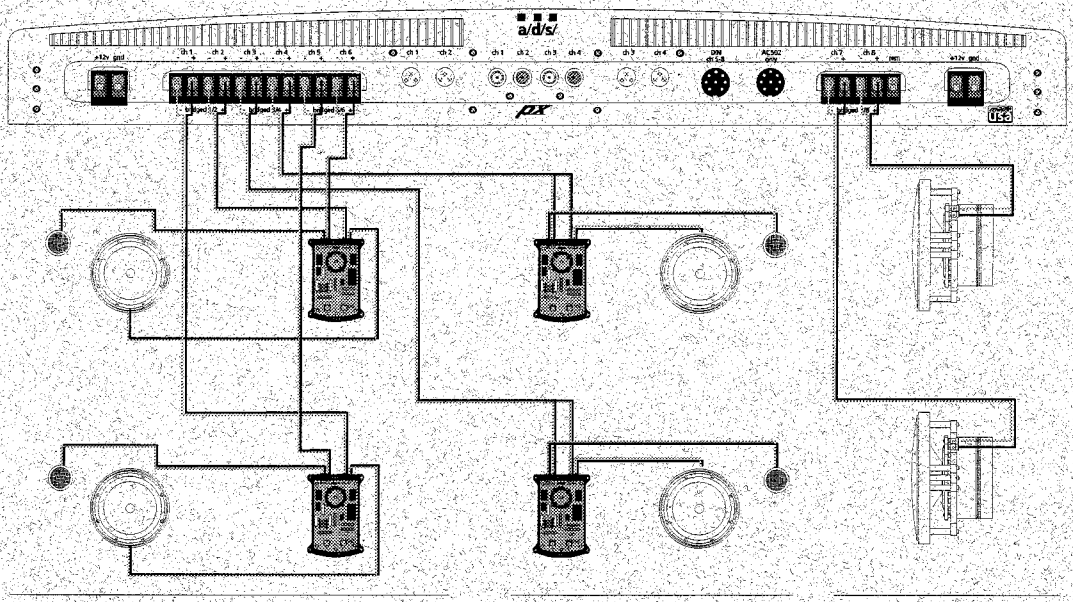
system a1 - (front channels bi-amped/rear channels full-range stereo/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left tweeter
2	<	2	75W	hp	front right tweeter
3	<	1	75W	band-pass	front left midrange
4	<	2	75W	band-pass	front right midrange
5	<	3	25W	hp	rear left
6	<	4	25W	hp	rear right
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

system a2 - (front channels bi-amped/rear channels full-range mono/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left tweeter
2	<	2	75W	hp	front right tweeter
3	<	1	75W	band-pass	front left midrange
4	<	2	75W	band-pass	front right midrange
5	<	3 + 4	25W	hp	rear
6	<	3 + 4	25W	hp	rear
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: DIN connector pin 8 is not functional on a1 and a2.



front rear sub

system configuration - b

system b - (front channels bi-amped/rear channels full-range "ambience"/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	band-pass	front left midrange
2	<	2	75W	band-pass	front right midrange
3	<	3 - 4	75W	hp	rear left ambience
4	<	3 - 4	75W	hp	rear right ambience
5	<	1	25W	hp	front left tweeter
6	<	2	25W	hp	front right tweeter
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: Channels 3 & 4 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

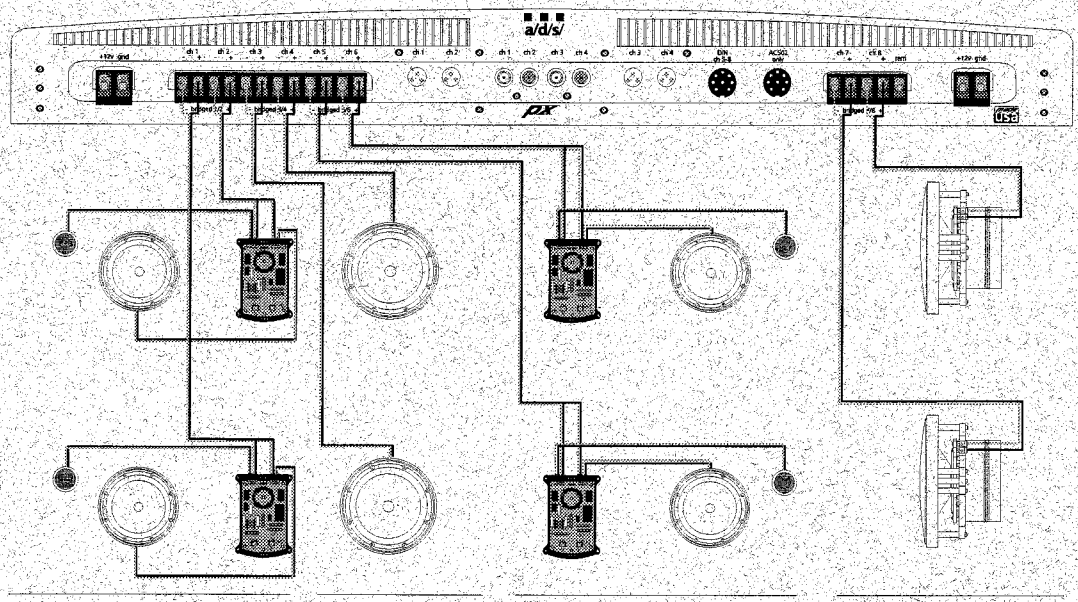
system b1 - (front channels bi-amped/rear channels full-range stereo/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	band-pass	front left midrange
2	<	2	75W	band-pass	front right midrange
3	<	3	75W	hp	rear left
4	<	4	75W	hp	rear right
5	<	1	25W	hp	front left tweeter
6	<	2	25W	hp	front right tweeter
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

system b2 - (front channels bi-amped/rear channels full-range mono/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	band-pass	front left midrange
2	<	2	75W	band-pass	front right midrange
3	<	3 + 4	75W	hp	rear
4	<	3 + 4	75W	hp	rear
5	<	1	25W	hp	front left tweeter
6	<	2	25W	hp	front right tweeter
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: DIN connector pin 8 is not functional on b1 and b2.



front midbass rear sub

system configuration - c

system c - (front channels bi-amped with midbass/rear channels full-range "ambience"/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	1+3	75W	band-pass	left midbass
4	<	2+4	75W	band-pass	right midbass
5	<	3 - 4	25W	hp	left rear ambience
6	<	3 - 4	25W	hp	right rear ambience
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: Channels 5 & 6 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

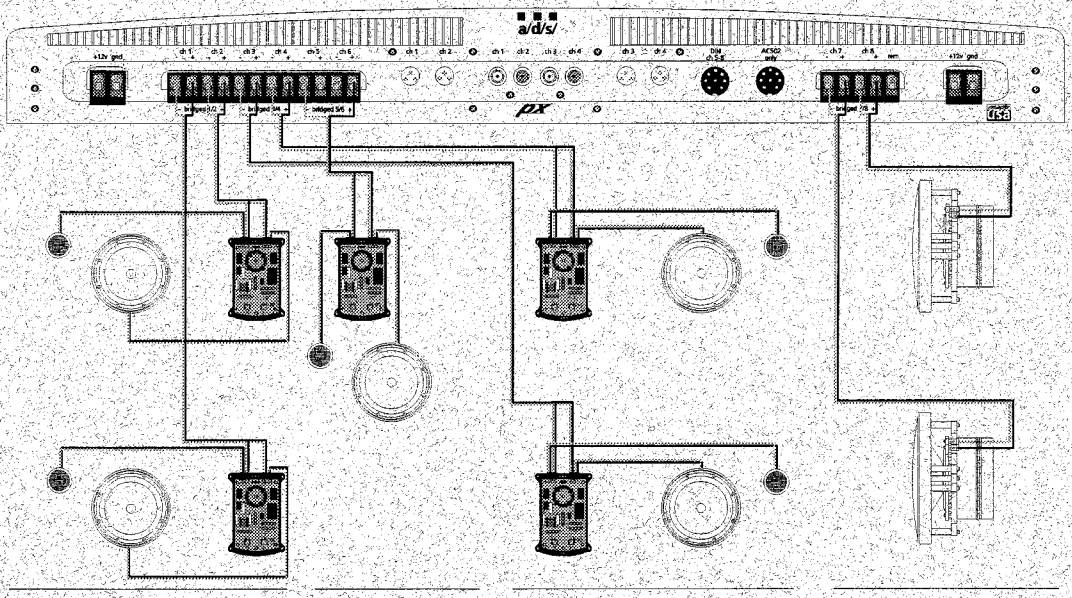
system c1 - (front channels bi-amped with midbass/rear channels full-range stereo/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	1+3	75W	band-pass	left midbass
4	<	2+4	75W	band-pass	right midbass
5	<	3	25W	hp	left rear
6	<	4	25W	hp	right rear
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

system c2 - (front channels bi-amped with midbass/rear channels full-range mono/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	1	75W	band-pass	left midbass
4	<	2	75W	band-pass	right midbass
5	<	3 + 4	25W	hp	rear
6	<	3 + 4	25W	hp	rear
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: DIN connector pin 8 is not functional on c1 and c2.



system configuration - d

system d - (center & front channels full-range/rear channels full-range "ambience"/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	3 - 4	75W	hp	rear left ambience
4	<	3 - 4	75W	hp	rear right ambience
5+6 (bridged)	<	1+2	75W	hp	center channel
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: Channels 3 & 4 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

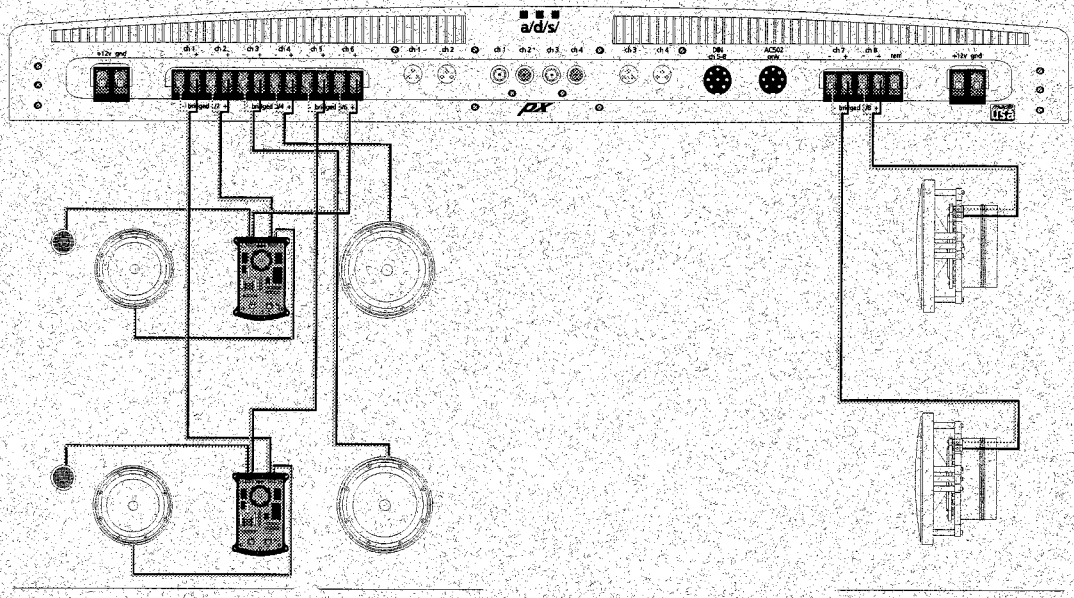
system d1 - (center & front channels full-range/rear channels full-range stereo/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	3	75W	hp	rear left
4	<	4	75W	hp	rear right
5+6 (bridged)	<	1+2	75W	hp	center channel
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

system d2 - (center & front channels full-range/rear channels full-range mono/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	front left
2	<	2	75W	hp	front right
3	<	3 + 4	75W	hp	rear
4	<	3 + 4	75W	hp	rear
5+6 (bridged)	<	1+2	75W	hp	center channel
7	<	1+3	125W	lp	left subwoofer
8	<	2+4	125W	lp	right subwoofer

Note: DIN connector pin 8 is not functional on d1 and d2.



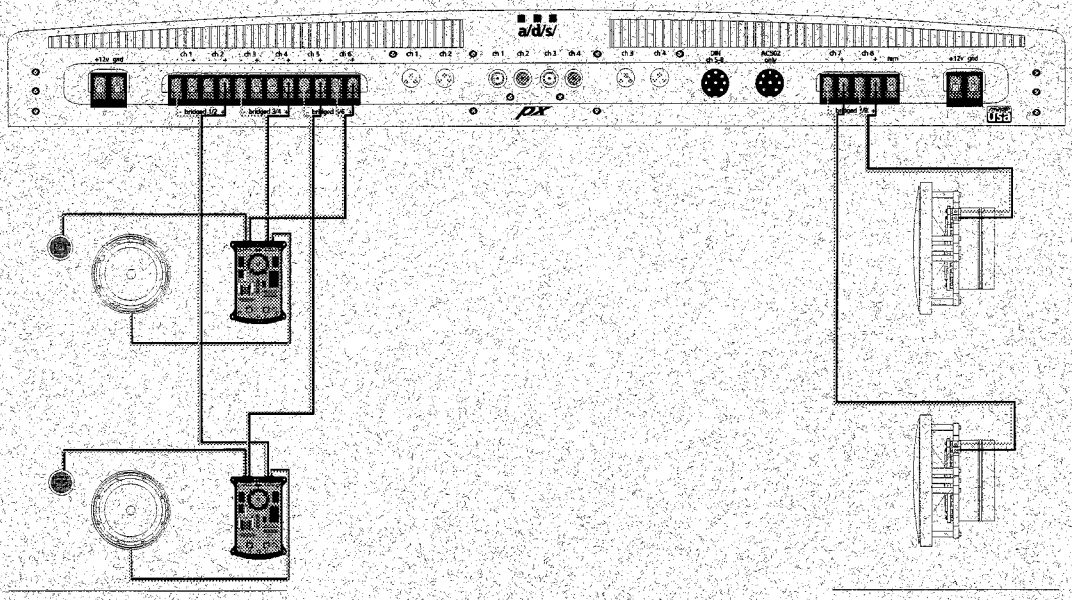
front midbass sub

system configuration - e

system e - (front channels tri-amped/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	band-pass	left midrange
2	<	2	75W	band-pass	right midrange
3	<	1	75W	band-pass	left midbass
4	<	2	75W	band-pass	right midbass
5	<	1	25W	hp	left tweeter
6	<	2	25W	hp	right tweeter
7	<	3	125W	lp	left subwoofer
8	<	4	125W	lp	right subwoofer

Note: In this configuration the head unit fader control may be used to adjust relative subwoofer level without the need for the AC502.



front

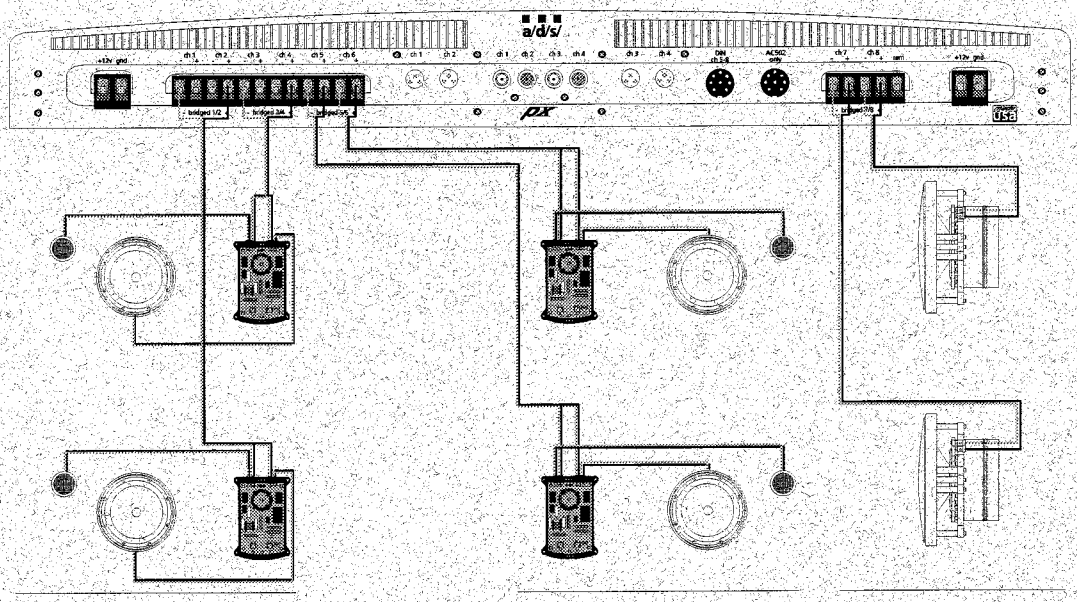
sub

system configuration - f

system f - (front channels bi-amped with bridged midrange/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1	200W	band-pass	left midrange
3 & 4 (bridged)	<	2	200W	band-pass	right midrange
5	<	1	25W	hp	left tweeter
6	<	2	25W	hp	right tweeter
7	<	3	125W	lp	left subwoofer
8	<	4	125W	lp	right subwoofer

Note: In this configuration the head unit fader control may be used to adjust relative subwoofer level without the need for the AC502.



front rear sub

system configuration - g

system g - (front channels bridged full-range/rear channels full-range "ambience"/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1	1	hp	front left
3 & 4 (bridged)	<	2	2	hp	front right
5	<	3 - 4	3 - 4	hp	rear left ambience
6	<	3 - 4	3 - 4	hp	rear right ambience
7	<	1+3	1+3	lp	left subwoofer
8	<	2+4	2+4	lp	right subwoofer

Note: Channels 5 & 6 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

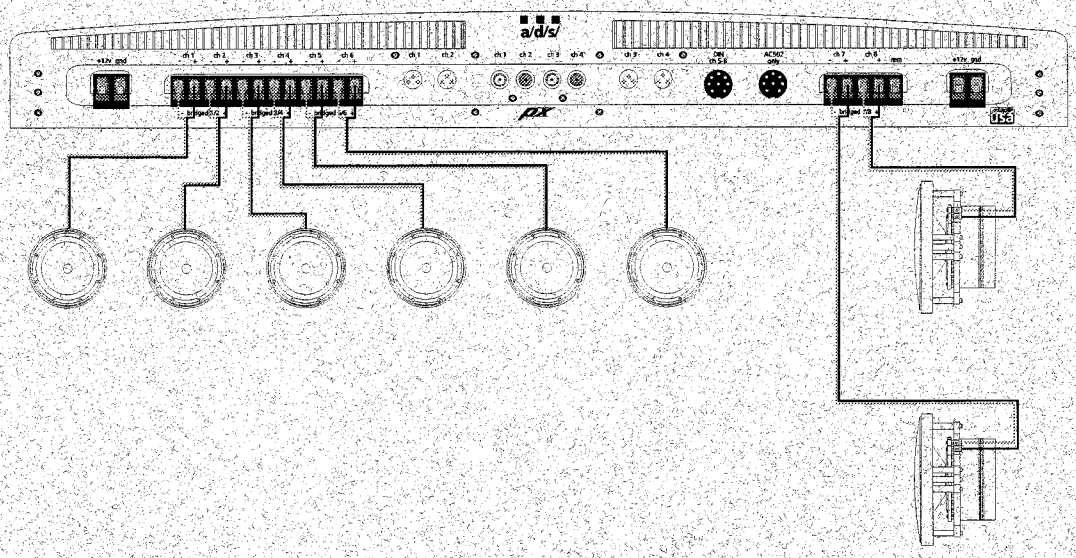
system g1 - (front channels bridged full-range/rear channels full-range stereo/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1	1	hp	front left
3 & 4 (bridged)	<	2	2	hp	front right
5	<	3 - 4	3 - 4	hp	rear left
6	<	3 - 4	3 - 4	hp	rear right
7	<	1+3	1+3	lp	left subwoofer
8	<	2+4	2+4	lp	right subwoofer

system g2 - (front channels bridged full-range/rear channels full-range mono/stereo subs)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1	1	hp	front left
3 & 4 (bridged)	<	2	2	hp	front right
5	<	3 - 4	3 - 4	hp	rear
6	<	3 - 4	3 - 4	hp	rear
7	<	1+3	1+3	lp	left subwoofer
8	<	2+4	2+4	lp	right subwoofer

Note: DIN connector pin 8 is not functional on g1 and g2.

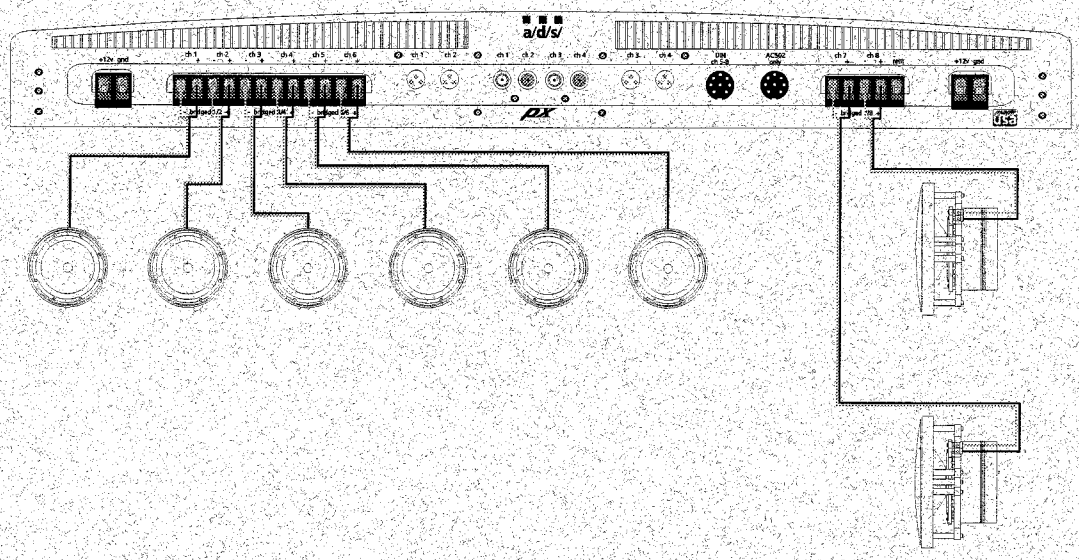


ch. 1 ch. 2 ch. 3 ch. 4 ch. 5 ch. 6 sub

system u (universal) - (8 channels in - 8 channels out)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	full-range
2	<	2	75W	hp	full-range
3	<	3	75W	hp	full-range
4	<	4	75W	hp	full-range
5	<	5	25W	hp	full-range
6	<	6	25W	hp	full-range
7	<	7	125W	lp	left subwoofer
8	<	8	125W	lp	right subwoofer

system configuration - u



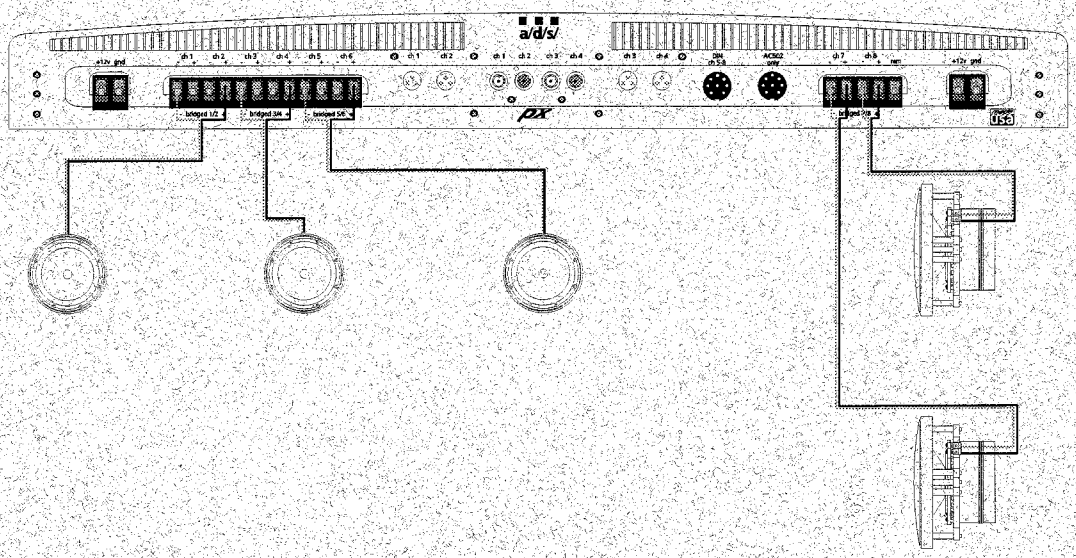
ch. 1 ch. 2 ch. 3 ch. 4 ch. 5 ch. 6 sub

system configuration - u1

system u1 (universal "ambience") - (8 channels in - 8 channels out)

output channel		from input channel	channel power	default crossover	intended function
1	<	1	75W	hp	full-range
2	<	2	75W	hp	full-range
3	<	3 - 4	75W	hp	full-range ambience
4	<	3 - 4	75W	hp	full-range ambience
5	<	5	25W	hp	full-range
6	<	6	25W	hp	full-range
7	<	7	125W	lp	left subwoofer
8	<	8	125W	lp	right subwoofer

Note: Channels 3 & 4 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".

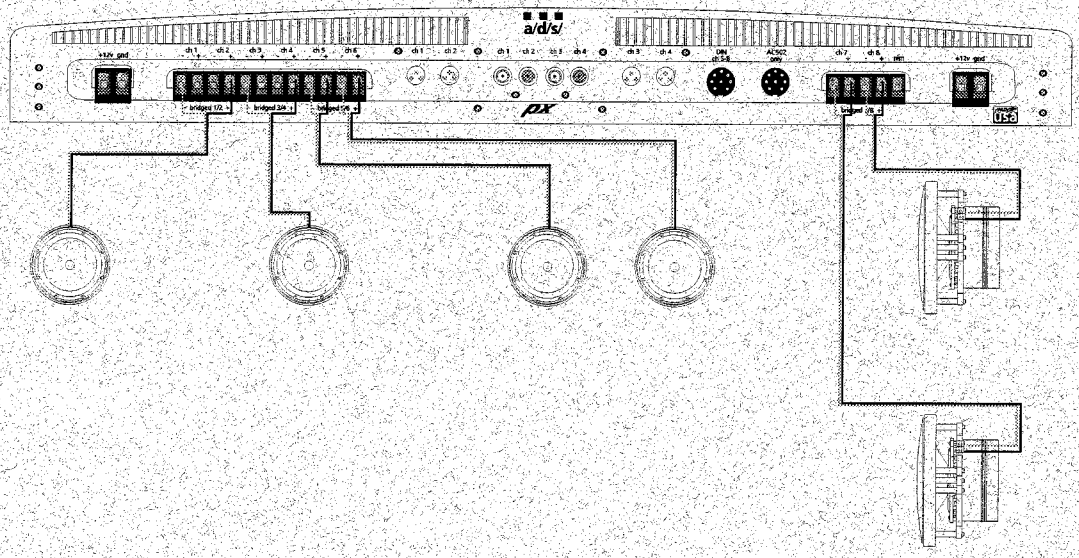


ch 1+2 ch 3+4 ch 5+6 sub

system u2 (universal bridged) - (8 channels in - 5 channels out)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1+2	200W	hp	full-range
3 & 4 (bridged)	<	3+4	200W	hp	full-range
5 & 6 (bridged)	<	5+6	75W	hp	full-range
7	<	7	125W	lp	left subwoofer
8	<	8	125W	lp	right subwoofer

system configuration - u2



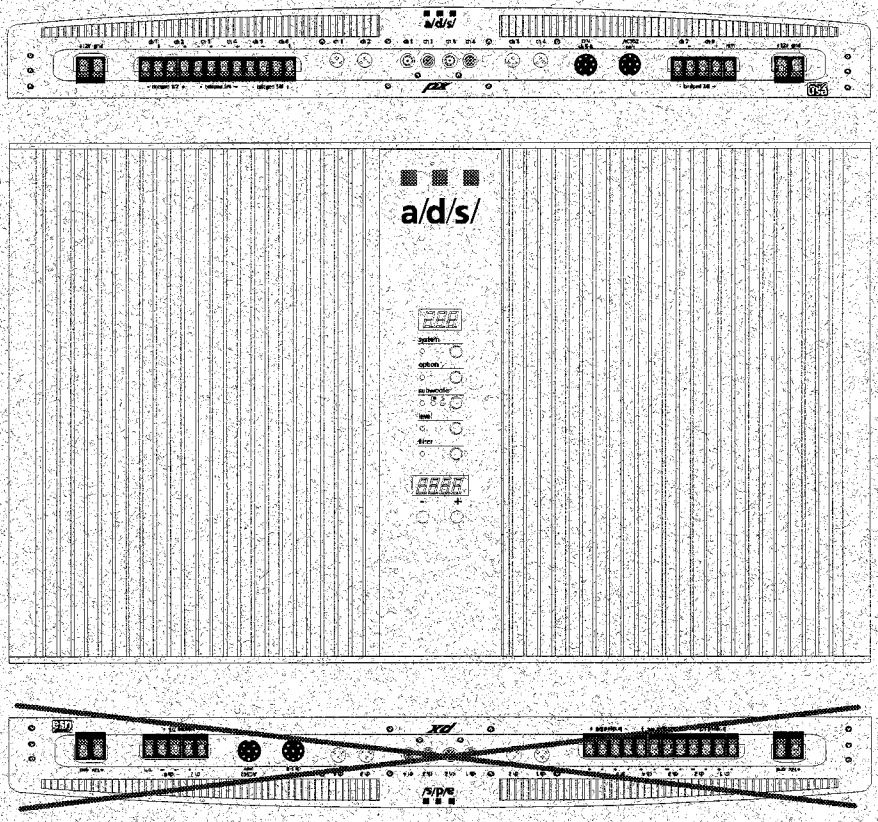
ch 1+2 ch 3+4 ch 5 ch 6 sub

system configuration - u3

system u3 (universal bridged "ambience") - (8 channels in - 6 channels out)

output channel		from input channel	channel power	default crossover	intended function
1 & 2 (bridged)	<	1+2	200W	hp	full-range
3 & 4 (bridged)	<	3+4	200W	hp	full-range
5	<	5 - 6	25W	hp	full-range ambience
6	<	5 - 6	25W	hp	full-range ambience
7	<	7	125W	lp	left subwoofer
8	<	8	125W	lp	right subwoofer

Note: Channels 5 & 6 "ambience" mode can be defeated by connecting pin 8 of the DIN connector to "ground".



mounting locations

Always mount the ***px***/a in a place that protects it from the elements. Be sure to mount the ***px***/a on a stable flat mounting surface. Whenever possible, pre-drill the mounting holes. Remember to check behind the panel for hidden dangers in the form of hoses, fuel or brake lines or electrical wiring. Use a marking pen or awl to mark the hole locations and pre-drill using a ⅛" bit.

Run all wires to the mounting location in advance of the final mounting.

passenger compartment mounting

The ***px***/a has been designed with a low profile and without fan cooling to make passenger compartment mounting possible. This may be the best choice in pickup trucks, SUV's or Hatchbacks. Regardless of where you choose to mount your ***px***/a be sure keep a minimum of 1" of clearance around the amplifier to insure adequate airflow and prevent overheating.

trunk compartment mounting

The most common mounting location is in the trunk or cargo compartment. For optimum cooling, mount the ***px***/a chassis vertically with the fins running vertically, or mount the ***px***/a horizontally with the fins pointing upward. Avoid horizontal mounting locations with the fins pointing downwards.

Also, locate the ***px***/a where it, and connections to it, will not be damaged by cargo or tools which may shift during vehicle operation.

engine compartment mounting

Don't even think about it! The ***px***/a was not designed to endure the harsh chemical and heat environment of the engine compartment. Failure to obey this warning will void your warranty.

All of the connections to the ***px***/a are made through plug-in connectors. The speaker and power connectors use plug-in screw-type connectors. The inputs require either RCA plugs, Mini-XLR, or DIN plugs depending on the system configuration and options you choose. This allows you to conveniently make all of your wiring connections without the amplifier chassis in place. Once the connections are made, the connectors simply plug into the side of the amplifier. To make the most solid connection on the speaker and power connections, strip each wire approximately ¼" and insert into the appropriate hole on the connector. Firmly tighten the screw to secure the wire. It is neither necessary nor recommended to tin or install pins to the wire before inserting it into the connector.

power connections

The ***px***/a uses an unusual scheme for power connection. To assure the highest purity, separate power supplies are used for the main amplifier and the subwoofer channels. These power supplies each have their own power and ground connections located at each end of the connection panel. It is recommended that AWG#8 wire be used for each power and ground connection. The two ground connections should be terminated at a common ground point at the vehicle chassis. The two power wires should be individually run to a common terminal block within a few inches of the amplifier. The wiring from the terminal block to the battery should be AWG#4 or larger. If a power supply capacitor is used, it may be connected at the terminal block.

Install either a 100 Amp fuse or 100 Amp circuit breaker in the power wire within 18" of the battery.

Keep the Ground wires minimum length and attach solidly to a clean metal part of the vehicle. The addition of a 1 - 2 Farad power supply capacitor, mounted as close as possible to the ***px***/a, may improve performance in some systems.

remote connection

The remote power lead of the ***px***/a draws very little current. Common AWG18 – AWG24 wire may be used.

speaker connections - stereo

The speaker terminals accept up to AWG #12 speaker wire.

Channels 1 - 6: Minimum recommended impedance is 2 Ohm stereo.

Channels 7 & 8: Minimum recommended impedance is 1 Ohm stereo.

speaker connections - bridged

Channels 1 - 6: Minimum recommended impedance is 4 Ohms when bridged.

Channels 7 & 8: Minimum recommended impedance is 1.5 Ohms when bridged.

input connections

The ***px***/a provides three types of input connection. The proper choice depends on the other system components and on the system configuration chosen. The most common connection is through conventional RCA plugs using shielded audio cable. The ***px***/a has four channels of input to correspond with the four channels of output generally available on most head units. The function of each of these four channels depends on the system configuration chosen, but usually input channels 1 & 2 are connected to the left front and right front head unit outputs. Channels 3 & 4 generally are connected to the left rear and right rear head unit outputs.

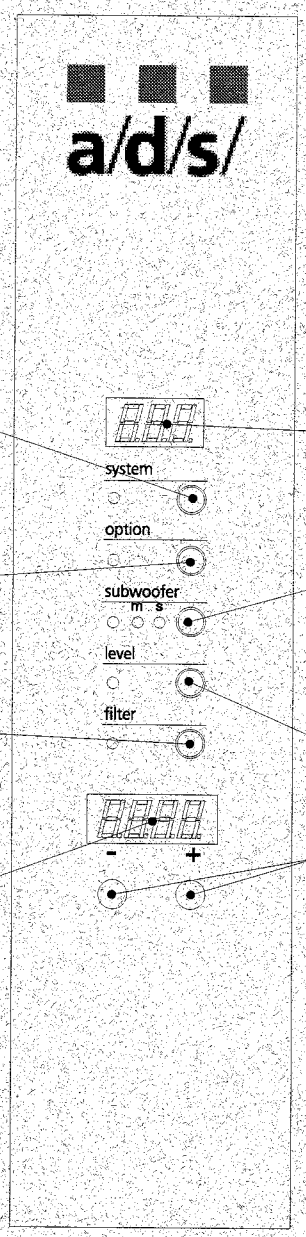
If the ***px***/a is driven from a source which provides balanced signals, the mini-XLR plugs are used instead. The wiring follows standard XLR convention. The balanced input must be chosen in the system setup when you set the input sensitivity range.

To access channels 5-8 directly, you must use the DIN input jack.

recommended for experienced professional installers only

1. After choosing the system that best suites you, Disconnect the battery ground wire. Reconnect the cable only after the installation is complete and the wiring has been checked to make sure that there are no problems. If your radio features a code type security system be sure you know the code before disconnecting the battery!
2. Run an AWG #4 power wire directly from the battery to a distribution block as near to the ***px***/a mounting location as possible. Install a fuse holder or 100 Amp circuit breaker at the battery end of this cable within 18" of the battery. If you install a fuse holder, do not install the fuse at this time.
3. Run two minimum AWG #8 power wires from the distribution block to the positive (+) power terminals on the ***px***/a.
4. Attach two AWG #8 ground wires to a solid chassis ground point near the mounting location. Keep these wire as short as possible. Scrape all paint and primer off of the sheet metal at the ground point to ensure a good electrical connection. Attach both wires to the ground point with a nut, bolt and star washer.
5. Run the signal leads and remote turn-on lead from the head unit to the ***px***/a location. If using an internally powered radio or factory radio refer to the *planning your system* section for the proper wiring connections.
6. Install the speakers and run each of the speaker leads to the ***px***/a location. Connect the speaker, remote, and power wires to the appropriate terminals on the plug-in terminal blocks. Refer to the *connections* or *planning your system* sections for information on the proper connections. The terminal blocks install with the set screws facing down.
7. Mount the amplifier into position and plug in the power and speaker terminals. Attach the input signal cables.
8. Re-attach the battery ground wire.
9. Double check your switch and control settings. If you opted for the fuse holder instead of the circuit breaker, install a 100 Amp fuse in the fuse holder and reconnect the vehicle battery ground now.
10. Turn on the signal source at a low volume level and select the system configuration you have decided on.
11. Adjust the input sensitivity and crossover frequencies as described in the "system tuning" section.
12. Read the rest of the manual to get maximum use and enjoyment from your system.

control panel layout



system selector
chooses system configuration

option selector
selects stereo / mono / ambience modes for rear channels on applicable systems

filter selector
selects channel pairs for frequency and mode adjustment

frequency / level display
displays level or frequency of the function being adjusted

system / mode display
shows selected system or currently active adjustment

subwoofer mode
selects mono / stereo subwoofer signal

level selector
selects individual channels for level adjustment

level / frequency adjustment
selects individual channels for level adjustment

Setting up the ***px***/a is quite different from the set-up of a conventional amplifier, yet it is also very simple. There are no conventional level or frequency controls, and no signal routing switches as on other a/d/s/ amplifiers. On the ***px***/a these are replaced by a sophisticated digital signal processing stage which handles all of the signal routing and crossover chores. The signal path is completely free of any switches or potentiometers, and therefore eliminates their inherent contribution to noise and distortion. All of the control settings and system configuration choices are selected and adjusted with the pushbuttons and displays on the central control panel.

system button

The first step in setting up the system is to determine the system configuration you will be using. The pre-programmed system layouts are labeled systems a, b, c, d, e, f, g, and u. These are shown on the diagrams on pages 9 - 19. To select the chosen system configuration simply hold down the system button on the control panel until the desired letter appears on the top display. When the button is released, there is a two second delay before the new system values are loaded. This is to allow you to cycle through the systems without applying inappropriate settings to the amplifier. After this delay, the system will be configured as selected.

option button

Some system configurations provide options for how the rear-fill channels are configured. With these systems, the default system (no option number indicated) places the rear channels in L-R "ambience" mode. Grounding pin #8 of the DIN input jack to ground will defeat the "ambience" mode. A switch may be mounted in the vehicle dashboard to allow the user to switch the surround option on and off from the listening position. If Option 1 is selected the rear speakers are connected in conventional stereo. With Option 2, the rear speakers are L+R summed monaural. In Option 1 and 2 systems, the DIN jack pin 8 surround defeat option is inoperative. Option settings are applied immediately without a two-second delay.

subwoofer button

Pressing this button toggles between mono and stereo mode for the subwoofer channels 7 & 8.

level button

This button changes the display to show either the input sensitivity or the individual level settings for the current system.

Upon the initial press of this button, the upper display will show the letters IPS (for InPut Sensitivity), and the lower display will show the input mode and input sensitivity as follows:

Display	Active Inputs	Sensitivity (for full output)
u0.25	Unbalanced	250 millivolts
b0.25	Balanced	250 millivolts
u1.00	Unbalanced	1 volt
b1.00	Balanced	1 volt
u2.00	Unbalanced	2 volts
b2.00	Balanced	2 volts
u6.00	Unbalanced	6 volts
b6.00	Balanced	6 volts

Choose the setting for the input sensitivity closest to but above the output voltage rating of your head unit. The voltages on the previous chart are RMS voltages. To convert the output rating of a head unit rated in peak-to-peak voltage to RMS voltage, multiply the rating by .707. For example, a head unit rated to deliver 8V peak to peak is the same as 5.656V RMS, so you would use the 6V setting. For most systems, the u2.00 or u6.00 settings will be the most appropriate.

The +/- buttons below the lower display controls the input level sensitivity.

The unit stays in the input level setting mode until either the level button is pressed again or the system button is pressed.

When the level button is pressed again, the upper display changes to LL1, and the lower display shows the current level for channel 1. Pressing the button again switches the display to channel 2 and so on for all eight channels. The values displayed on the lower display range from 0 to 100, and are applicable to the channel indicated on the upper display. When 0 is indicated on the lower display, the output for that channel is –50dB with respect to the input. When the display reads 100, the output is not attenuated. This gives the ability to adjust the levels of each channel in 1/2dB steps. As with the input sensitivity adjustment, the +/- buttons control the level.

Note: To return to the input sensitivity display, you must press the system button (or allow the level display to time out) then press the level button again.

filter button

Pressing this button changes the upper display to indicate a filter pair in the following sequence:

Display	Meaning
H12	High pass filter on channels 1 & 2
L12	Low pass filter on channels 1 & 2
H34	High pass filter on channels 3 & 4
L34	Low pass filter on channels 3 & 4
H56	High pass filter on channels 5 & 6
H78	High pass filter on channels 7 & 8
L78	Low pass filter on channels 7 & 8
D78	Damping control on channels 7 & 8

Channels 5 and 6 do not have a low-pass filter option.

The lower display reads the –3dB corner-frequency of the crossover filter selected in the upper display. The frequency is in Hz, and is adjusted up or down in 1/3 octave steps by the +/- buttons.

If you press the + button at the upper end of the frequency adjustment range, there is no effect.

If you press the – button at the lower end of the frequency adjustment range, that filter is bypassed and the lower display reads OFF.

Note: The available filter range of any particular filter depends on the filter type (satellite or sub-woofer) and also on the setting of the other filter on that pair of channels. If you attempt to set the low-pass filter lower than the high pass filter, the low-pass will be turned "OFF". Pressing the + button will turn it on again at the lowest frequency which does not overlap the high-pass.

Setting the low pass filter to maximum will effectively disable the high pass filter, and setting the high pass filter to minimum will effectively disable the low pass filter.

Channels 7 & 8 have a different adjustment range than the other six channels. The Channel 7 & 8 low pass filter can be set to 31, 40, 50, 63, 80, 100, 125, 160, or 200Hz. It may also be bypassed. The high-pass filter on channels 7 & 8 is set to a very low range, and has the additional capability of a damping adjustment. The HPF choices on channels 7 & 8 are 5, 6, 8, 10, 13, 16, 20, 25, 32, 40, 50, 63, 80, and 100Hz. This enables it to be used for low frequency equalization, or as an infrasonic filter. Setting the channel 7 & 8 high pass filter to a low frequency, for example 30Hz, will remove infrasonic noise from the signal with little or no audible effect on normal musical program material. This is recommended if the ***px***/a is used to drive subwoofers in a vented enclosure.

When the upper display shows d78, the lower display shows the damping value in dB. The range is from 0 to 3 and corresponds to the amount of boost applied slightly above the high pass filter frequency. Setting the high pass filter to 30Hz, with a damping value of 3 will result in a 3dB boost near 30 Hz, and a 12dB per octave infrasonic filter below 30Hz.

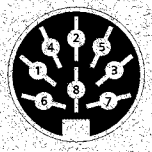
general notes

- In all modes, except as otherwise indicated, the system will revert to the system display after two seconds of inactivity. Changes are stored in the system memory at this time.
- Pressing the system button once while in any other display mode changes the display back to the current system and saves any changes. Pressing the system button again while in the system display mode saves the current system, then changes to the next system after the two-second delay described above.
- The vertical row of LED's next to each mode selector button will indicate which mode is active.

DIN channel 5-8 & surround defeat connector

Pin	Function
1	*not used*
2	audio signal ground
3	channel 6
4	*not used*
5	channel 5
6	channel 7
7	channel 8
8	pin to ground defeats surround processing

jack configurations / accessories



optional accessories

Model	Style	Description
AC201	cable adapter	8 pin DIN jack (female) - 6 phono plugs (male)
AC202	chassis adapter	8 pin DIN plug (male) - 6 phono jacks (female)
AC203	1 foot cable	8 pin DIN plug (male) on each end
AC204	6 foot cable	8 pin DIN plug (male) on each end
AC205	15 foot cable	8 pin DIN plug (male) on each end
AC206	break-out box	1 DIN jack (female) in - 2 DIN jacks (female) out (for pin reassignments).
AC207	chassis adapter	8 pin DIN plug (male) - 6 phono plugs (male)

using the AC502 (optional)

The AC502 remote level control, available as an accessory from your a/d/s/ dealer, may be used with your ***px***/a to remotely adjust the gain of the subwoofer channels.

troubleshooting

symptom	probable cause	action to take
no output	low or no remote turn-on input	check remote turn-on voltage output at amplifier and fix as needed.
	fuse(s) blown	check power wire integrity and for reversed polarity. Fix as needed and replace fuse (s).
	power wires not connected	check power wire and ground connections and fix or replace as needed.
	audio input not connected or no output from source	check rca/mini-XLR/din connections and signal integrity, fix or replace as needed.
audio cycles on and off	speaker wires not connected	check speaker wires and fix or replace as needed.
	speakers are blown	check system with known working speakers and fix or replace as needed.
	thermal protection engages when amplifier heatsink temperature exceeds 90 C	make sure there is proper ventilation for amplifier and improve ventilation as needed.
	loose or poor audio input	check rca/din connections and fix or replace as needed.
	loose power connections	check power wire and ground connections and fix or replace as needed.
distorted output	amplifier level sensitivity set too high,exceeding maximum capability of amplifier	reset gain. refer to the "system tuning" section of this manual for detailed instructions.
	impedance load to amplifier too low	check speaker impedance load. if channels 1 - 6 are below 2 ohms stereo or 4 ohms bridged, or channels 7 & 8 are below 1 ohm stereo or 2 ohms bridged, rewire speakers to achieve a higher impedance.
	shorted speaker wires	check speaker wire connections and fix or replace as needed.
	speaker not connected to amplifier properly	check speaker wiring and fix or replace as needed.
	internal crossover not set properly forspeaker	reset crossovers. refer to the system tuning section of this manual for detailed instructions.
	speakers are blown	check system with known working speakers and fix or replace as needed.

poor bass response	speakers wired with wrong polarity causing cancellation at low frequency	check speaker polarity and fix as needed.
	crossover set incorrectly	reset crossovers. refer to the digital crossover configuration section of this manual for detailed instructions.
battery fuse blown	impedance load to amplifier too low	check speaker impedance load. if channels 1 - 6 are below 2 ohms stereo or 4 ohms bridged, or channels 7 & 8 are below 1 ohm stereo or 2 ohms bridged, rewire speakers to achieve a higher impedance.
	short in power wire or incorrect power connections	check power and ground connections and fix or repair as needed.
	fuse used is smaller than recommended	replace with proper fuse size.
	too much current being drawn	check speaker impedance load. if channels 1 - 6 are below 2 ohms stereo or 4 ohms bridged, or channels 7 & 8 are below 1 ohm stereo or 2 ohms bridged, rewire speakers to achieve a higher impedance.
		check power and ground connections and fix or repair as needed.
amplifier fuse blowing	too much current being drawn	check speaker impedance load. if channels 1 - 6 are below 2 ohms stereo or 4 ohms bridged, or channels 7 & 8 are below 1 ohm stereo or 2 ohms bridged, rewire speakers to achieve a higher impedance
		check power and ground connections and fix or repair as needed.
	fuse used is smaller than recommended	replace with proper fuse size.

px/a specifications

amplifier section

power output @ 4 ohms	ch. 1 - 4 = 75 watts RMS per channel ch. 5 & 6 = 25 watts per channel ch. 7 & 8 = 125 watts per channel
power output @ 2 ohms	ch. 1 - 4 = 100 watts RMS per channel ch. 5 & 6 = 35 watts per channel ch. 7 & 8 = 250 watts per channel
power output @ 1 ohms	channels 7 & 8 = 325 watts per channel
power output bridged @ 4 ohms	ch. 1+2 & 3+4 = 200 watts RMS per channel ch. 5+6 = 70 watts ch. 7+8 = 500 watts
min. recommended impedance	ch. 1 – 6: 2 ohms / channels 7 & 8: 1 ohm
signal to noise ratio (rated power)	> 105dB
signal to noise ratio (1 watt)	> 95dB
input sensitivity	.25 - 6 volts
input impedance	10kOhms
fuse type	(4) 40 amp ATC

crossover section

channels 1 & 2 Frequencies	high pass & low-pass 45Hz – 5kHz @ 12dB per octave 45Hz – 5kHz @ 12dB per octave
channels 3 & 4 Frequencies	high pass & low-pass 45Hz – 5kHz @ 12dB per octave 45Hz – 5kHz @ 12dB per octave
channels 5 & 6 Frequencies	high pass 45Hz – 5kHz @ 12dB per octave
channels 7 & 8 Frequencies	high pass & low-pass 1Hz – 100Hz @ 12dB per octave 40Hz – 200Hz @ 48dB per octave

general

Dimensions	25" w x 15 ½" d x 3" h (635mm x 394mm x 76.2mm)

warranty information

There are two things you must do to ensure trouble free service in the event you need warranty repairs.
1 - Keep your original sales receipt in a safe place. A copy of the receipt will be required to obtain warranty service.
2 - Be sure your retail dealer has written the date, the model number, and the serial number (if applicable) of the Product on the receipt.
To give yourself an extra measure of protection, make a separate record of the information about your purchase and keep it in a safe place. In the event you misplace the sales receipt, your dealer may be able to give you a copy.
Take a moment now to read the terms of your warranty. Check to be sure your sales receipt is dated and has the Product model number and serial number (if applicable) on it. Then put it away in a safe place.

When shipping a Product in for service:

- Enclose a copy of your original sales receipt that has the date, the Product model number and serial number (if applicable) written on it.
- Always ship Products in the complete original packing material.
- Avoid shipping Products via the Postal service. If you must use the Postal service, be sure to register and insure the package.

a/d/s/ Limited Warranty

Analog and Digital Systems, Inc. (a/d/s/) warrants to the original consumer purchaser of the a/d/s/ Products described in this manual, that the Product will be free from defects in materials and workmanship for a period of one (1) year after the date of purchase. If the product is installed by an authorized a/d/s/ retail dealer, the warranty is extended to three (3) years, a/d/s/' sole obligation under this warranty shall be to provide, without charge, parts and labor necessary to remedy the defects, if any, that appear during the warranty period.

This warranty is the sole and exclusive express warranty given with respect to the Product. All other express warranties are hereby excluded. Neither a/d/s/ nor the authorized dealer who sells the Product is responsible for indirect, incidental, or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.
IMPORTANT - Keep your original sales receipt. Be sure the retail dealer has written on it the date, model number, and serial number (if applicable) of the Product. This information is required for warranty service.

This warranty is limited to:

- Products purchased from authorized a/d/s/ retail dealers in the United States. a/d/s/ will supply a list of authorized dealers on request.

In order to obtain warranty service you must:

- Return the Product, freight prepaid, to the a/d/s/ dealer from which it was purchased, an authorized a/d/s/ independent service agency, or to a/d/s/. If necessary you may call a/d/s/ Customer Service Department for the names and addresses of authorized independent service agencies in your area.
- Provide proof of purchase in the form of a copy of your original sales receipt. The date, model number, and serial number (if applicable) of the Product must be written on the sales receipt.

This warranty does not cover:

- Damage that is the result of misuse, abuse, accident (including but not limited to damage by water), faulty hookup, defective or maladjusted associated equipment, or the use of the Product with equipment for which it was not intended.
- Cosmetic defects that appear more than thirty (30) days after the date of purchase. Cosmetic damage caused by improper handling is also excluded.
- Products that are used for commercial purposes.
- The cost of removing or reinstalling the Product.
- Damage that occurs while the Product is being shipped to whoever will service it. See the information above regarding shipping procedures.

This warranty is void if:

- The Product identification or serial number label is removed or defaced in any way.
- The Product is serviced or repaired by any one other than a/d/s/ or an authorized a/d/s/ dealer or service agency.