

ADS

Owner's Manual

PAT

ADS

Owner's manual

PAT

2	Introduction
3	Unpacking
4	Features and controls
5	Installation and connections
10	Operation
12	In case of difficulty
13	Maintenance
14	Specifications

Thank you for purchasing ADS PA1 Biampifiers. Each PA1 contains two high performance power amplifiers and an advanced electronic crossover network mounted on a strong integral chassis/heatsink.

The PA1 conveniently brings the benefits of biampification to ADS loudspeakers designed for use with it. The benefits from amplifying the bass and treble frequencies separately include:

- Higher dynamic headroom, since large bass signals do not compromise the peak output capability of the high frequency amplifier.
- Lower IM distortion, thanks to the separate amplification of low and high frequencies.
- Better coupling of the low frequency amplifier to the speaker's woofer section by eliminating the series impedance of the passive crossover network. This improved coupling results in less woofer overshoot, tighter bass, and better bass transient response.

The PA1's electronic crossover is carefully matched to the characteristics and requirements of ADS loudspeakers to form a better acoustic transition between the woofer and the high frequency drivers.



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The PA1 also contains an adjustable bass equalizer which effectively extends the system's deep bass response by electronically boosting the speaker output below the woofer resonance point.

The PA1 securely and conveniently fits into a recess in the rear of the speaker and provides complete connection flexibility. From its clean, functional design to its unique engineering, the PA1 demonstrates ADS' commitment to the best in high fidelity sound reproduction.

This manual provides information on the connection and operation of your PA1 Biampifiers. Please read it thoroughly and save it for future reference.

Warning: Do not ship the speakers with the PA1's installed. Pack and ship the PA1's separately.

The two PA1 Biampifiers are packed in foam shells inside a rigid carton. Lift the shells with the PA1's out of the shipping carton, then remove the shells.

Shipping carton We suggest you save the carton and packing material for future use. Moving or shipping the PA1 Biampifiers in anything other than their factory carton can result in costly damage which is not covered by the warranty.

Owner's record Please record the PA1 serial numbers, the date and place of purchase in the spaces below.

Serial numbers

Date of purchase

Place of purchase

We urge you to save your sales receipt for future reference; you may want to attach it to this manual. Completing and mailing your **Owner's Registration Card** enters your purchase into our files.

Input jacks, chaining, main, receive stereo signals from either a preamplifier or power amplifier.

- The **main input** is the input to the PA1's amplifiers.
- The **chaining input** is connected directly to the **chaining output** jack. This routes the signal for the second stereo channel through to the other PA1.

Output jacks, chaining, main, route the stereo input signals out to the other PA1.

Pre/spkr selector switch adjusts the input sensitivity and impedance of the PA1 to match the output level from either a preamplifier or the speaker outputs of a power amplifier.

Level control provides a fine adjustment of the PA1's input sensitivity. The adjustment range is ± 6 dB.

Bass eq control adjusts the bass equalization boost level relative to the mid-bass level near the crossover point. The adjustment range is 0 to +6 dB at 25 Hz.

Power switch controls AC power input to the PA1. When the switch is in the **auto** position, the AC power is automatically turned on only when audio signal is fed to the PA1. When the switch is in the **on** position,

AC power is on continuously. The green LED indicator below the switch indicates power on when lit.

Power out connector provides AC power chaining to the other PA1 of a pair. This connector is "live" whenever there is power at the **power in** connector.

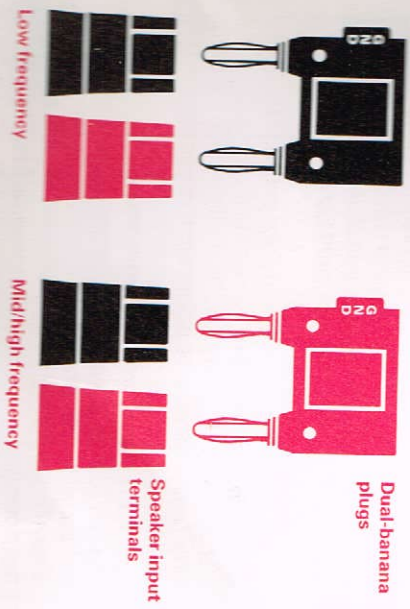
Power in connector receives AC power from the wall outlet or an accessory outlet on other equipment. The PA1 AC connectors are IEC standard types.

Output wires have dual-banana plugs which insert directly into the speaker input terminals of ADS speakers designed for use with the PA1. The red plug inserts into the mid/high frequency (high pass) terminal pair, and the black plug inserts into the low frequency (low pass) terminal pair. A rib marked **GND** on one edge of each dual-banana plug indicates the pin which inserts into the black input terminal of each pair.

Integral chassis/heat sink of solid cast aluminum provides strong support for the electronic circuitry and excellent cooling for the PA1's powerful amplifiers.

Mounting holes accept four Allen-type socket-head machine screws that hold the PA1 in the speaker's rear panel opening. The appropriate screws and an Allen wrench are provided.

Figure 1



Dual-banana
plugs

Speaker input
terminals

Low frequency

Mid/high frequency

Installation Read and follow the instructions in the *Bi-amplified operation* section of the speaker's manual to correctly set the speaker's *Biamp* switch.

Set the PA1 near the speaker's rear panel opening. The PA1 has two speaker wires, each with a color-coded dual-banana plug on the end. See Figure 1.

Insert the red plug into the ends of the speaker's mid/high frequency (right hand) input terminal pair. Make sure that the banana pin adjacent to the *GND* rib is in the black terminal.

Insert the black plug into the speaker's low frequency (left hand) terminal pair, again making sure that the banana pin adjacent to the *GND* rib is in the black terminal.

Set the PA1 into the speaker's opening. Use the supplied 3mm Allen wrench to insert the socket head screws through the PA1 mounting holes and into the threaded inserts in the speaker. Run the screws down loosely, and then tighten them firmly after all four screws have been started.

Note: Do not use amplifiers which require isolated speaker grounds. Consult your amplifier owner's manual.

Note: If the pre/spk switches are in the speaker position and the PA1's are connected to preamplifier outputs, severe distortion or excessively low signal levels may result because of preamplifier loading by the PA1's 600 Ohm input impedance.

Note: Connecting PA1-equipped speakers and a second pair of unamplified speakers to an amplifier having series-connected multiple speaker outputs (for example, an ADS Ate-lier R1) will result in sound only from the PA1 speaker pairs are selected. This is because the PA1's 600 Ohm input impedance limits current flow through the unamplified speakers. In this case, use one or the other set of speaker outputs, but not both. Consult your amplifier owner's manual for information about its speaker switching.

Note: The supplied signal cables have color-coded plugs. Use the black plug for the left channel, and the red plug for the right channel.

Signal connections The PA1's can be connected either to a preamplifier's output jacks (or the *pre out* jacks of an integrated amplifier or receiver), or to an amplifier's speaker output terminals. A pair of PA1's is supplied with the following stereo signal cables:

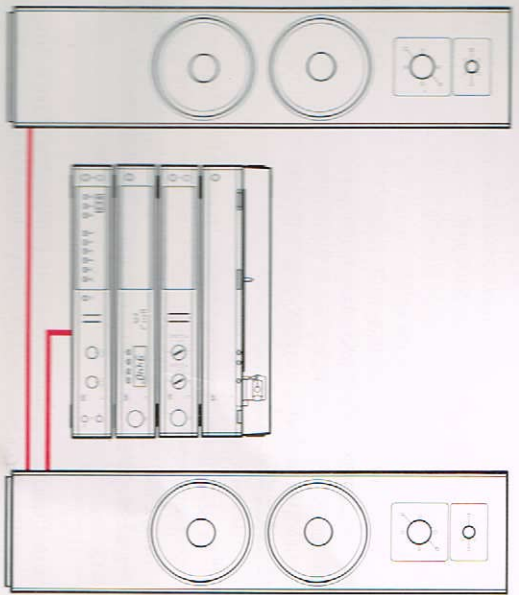
- One 5m/16' stereo cable, with color-coded male phono connectors on each end.

- One 7m/23' cable, with color-coded phono connectors on each end.

The 5m and 7m stereo signal cables connect between the signal source amplifier to the closer PA1 and between the two PA1's. Use the shorter cable between the closest two pieces of the three. See Figure 2 for typical cable routing.

- Two adapters, each with a color-coded female phono connector on one end, and stripped and tinned wires on the other end. These adapters are for connecting the stereo signal cable to the amplifier's speaker output terminals. Preserve stereo channel identity by attaching black connectors to black, and red to red. See Figure 3.

Figure 2



When using preamplifier outputs, set the PA 1 pre/sprk switches to the pre position. Use a coin edge to turn the switch. When using amplifier speaker outputs, set the PA pre/sprk switches to the sprk position.

Figure 3

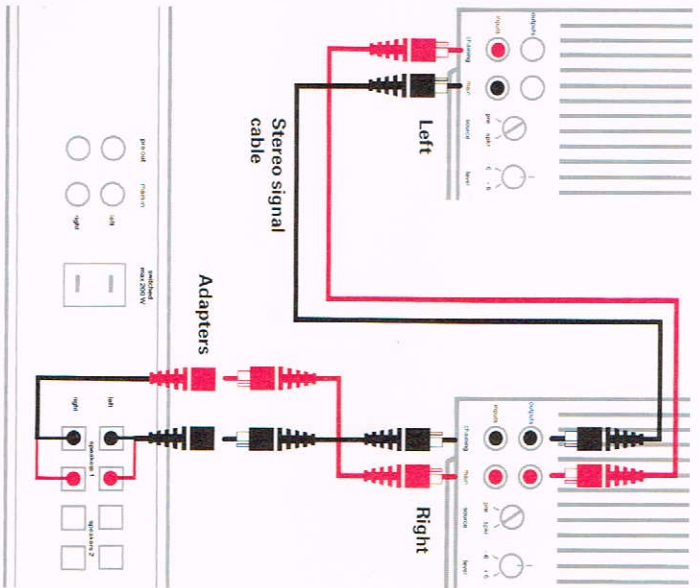
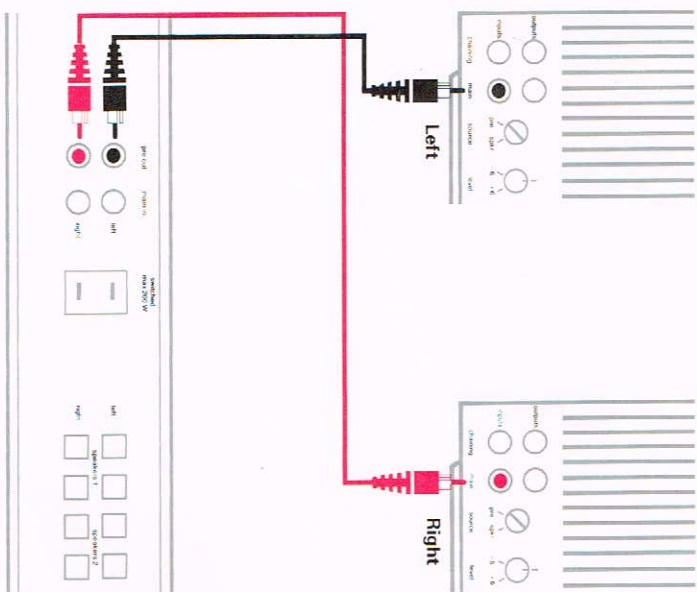


Figure 4



The *main input* is the input signal amplified by the PA1. The signal is also routed to the *main output jack* for chaining. The *chaining input* routes the signal to the accompanying *chaining output jack*.

Connect a signal cable to the preamplifier's left and right channel output jacks, or to the amplifier's left and right channel speaker terminals through the adapter cables. Insert the *black* plug in the source's *left* channel output jack and the *red* plug in the *right* channel output jack.

When you route the signal cables to each PA1 separately, as shown in figure 4, insert the *black* signal plug into the *left* speaker/PA1's *main input* jack, and the *red* signal plug into the *right* speaker/PA1's *main input* jack.

Note: You can separate the two halves of a stereo signal cable by slowly pulling them apart after carefully cutting the molded plastic collar.

Chaining When you route the source signal cable to one PA1 and chain to the other, as shown in figures 1 and 5, insert the matching channel plug of the source signal cable (red for right, or black for left) to the

main input jack of the channel you are going to *first*. Insert the other channel plug into the *chaining input* jack.

For example, when you go from the source to the *left* speaker/PA1 first, insert the *black* signal cable plug (from the left channel of the source) into the left speaker/PA1's *main input* jack, and the *red* plug into the *chaining input* jack.

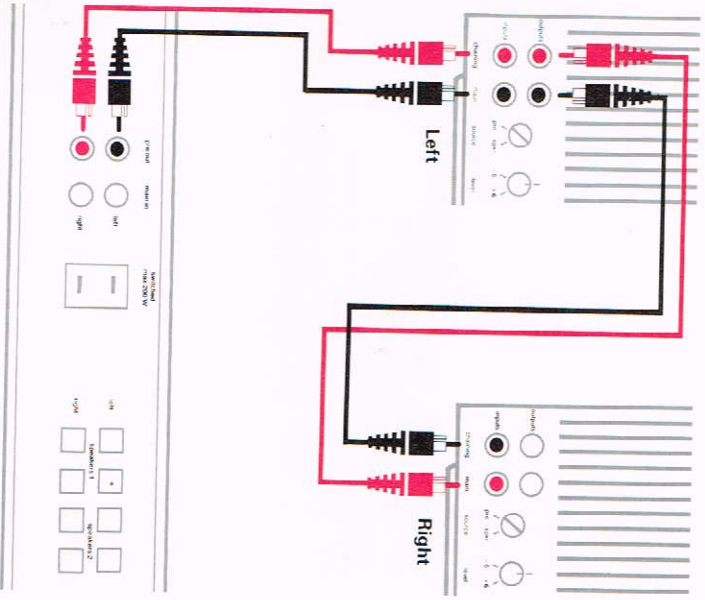
Insert the chaining signal cable into the *output* jacks of the first PA1, matching the colors of the plugs in the *input* jacks.

For example, when the source cable's *black* plug is in the *main input* jack, insert the chaining cable's *black* plug in the *main output* jack.

Insert the other channel of the chaining cable (red for right, or black for left) into the *main input* jack of the channel to which you are chaining.

For example, when you chain from the *left* speaker/PA1 to the *right* speaker/PA1, insert the *red* chaining signal cable plug (from the left PA1's *chaining output* jack) into the *right* speaker/PA1's *main input* jack.

Figure 5



Power connections Each PA1 consumes 500 Watts of power, maximum, and can supply an additional 500 Watts of power, maximum, through the *power* connector. A pair of PA1's is supplied with two power cords:

- One 5m/16' power cord, with an IEC connector at one end, and a US standard AC plug on the other. This cord is for directly connecting the PA1's to AC power outlets.

- One 7m/23' cord with IEC connectors on both ends—one male, one female. This cord is for chaining AC power from one PA1 to the other.

Plug the AC power cord of the PA1 into a convenient AC power outlet capable of supplying 2 x 500 or 1000 Watts.

Power on The green LED below the power switch indicates power-on. Delay circuitry in the PA1 disconnects the speakers during turn-on and turn-off to avoid transient noise.

When the PA1's power switch is in the *auto* position, audio signal at the *main input* jack will automatically turn the power on. The power will automatically switch off a few minutes after the audio signal ceases.

Automatic power operation can be overridden by setting the *power* switch to the *on* position.

- You may want to use the *on* setting after initial setup to aid in verifying correct connections. However, do not plug in or unplug cables while the green power LED is on.

- You may want to use the *on* setting when using digital Compact Discs or other digital sources, since their noise levels may be too low to trigger the automatic power-on circuits until the music actually starts.

- You may want to use the *on* setting when connecting the PA1's to AC outlets that are switched by the source amplifier or preamplifier. Be sure that the switched AC outlets on the other equipment can supply 1000 Watts, maximum, to the PA1's.

Level The volume level of both the low amplifier and the mid/high frequency amplifiers is controlled equally by the *level* control. The center adjustment range is 12 dB. The center position will work well in most installations.

If you have to turn the source amplifier high to get only moderately loud listening, you experience source amplifier distortion, increase the *level* control towards the *off* position. Be sure that the source amplifier level is down while you make this change.

On the other hand, if turning up the source level control only slightly above zero results in adequate listening levels, turn the *level* control towards the *6* position, to obtain more level control range.

As a rule of thumb, the 12 o'clock position of the source amplifier level control should provide room filling levels.

Level The volume level of both the low frequency amplifier and the mid/high frequency amplifier sections is controlled equally by the *level* control. The total adjustment range is 12 dB. The center-detented 0 position will work well in most installations.

If you have to turn the source amplifier level control high to get only moderately loud listening levels and/or you experience source amplifier distortion at this setting, increase the *level* control towards the +6 setting. Be sure that the source amplifier level control is turned down while you make this change.

On the other hand, if turning up the source amplifier level control only slightly above zero results in adequate listening levels, turn the *level* control down towards the -6 position, to obtain more source amplifier level control range.

As a rule of thumb, the 12 o'clock position of the source amplifier level control should produce loud, room filling levels.

Bass eq The level of the deep bass frequencies relative to the mid-bass frequencies is adjusted by the *bass eq* control. The adjustment range is 0 to +6 dB at 25 Hz. The center-detented position (resulting in a 3 dB boost at 25 Hz) will work well in most installations. Experiment freely with this control and use the setting which sounds best to you.

Loudspeaker compatibility The PA1 is intended for use with ADS loudspeakers designed specifically for it. Because of the specialized nature of its cross-over network, the PA1 is not appropriate for use with other loudspeakers.

Protection features The PA1 is equipped with circuitry which protects against short circuits in the loudspeaker, direct current through the loudspeaker terminals and amplifier thermal overload.

The PA1 automatically resumes normal operation after the cause of difficulty is corrected or after a sufficient cooling-off period.



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 persons.



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 appliance.

Most difficulties with high fidelity equipment result from loose or poor connections, bad connecting cables or lack of understanding of the unit's operation.

Below are some common difficulties with suggested remedies. If these remedies don't help, contact your ADS dealer for assistance. If you want to contact the factory directly, write or call:

Customer Service Manager
ADS, Analog & Digital Systems, Inc.
One Progress Way
Wilmington, Massachusetts 01887
617 658-5100

Difficulties and remedies

No power If you set the power switch to the *on* position and the power LED does not light, check the AC connections of the PA1. Check all power switches and fuses which control the outlet into which the PA1 is plugged. Test a suspect outlet with a lamp, and examine the plug and cord of the PA1. In the event of damage to the plug or cord, take the cord to an authorized ADS service agency for replacement.

Defects not detected by the PA1 electronic protection circuits will blow the internal power fuse. When this occurs, power is interrupted and the power LED is turned off. Unplug the PA1, remove it from the speaker, and take it to your authorized ADS service agency for assistance and determination of the cause of difficulty.

No sound When the PA1's power led is lit but there is no sound, check the controls and switches of the signal source, especially its tape monitor switches. Check the input cables and connections to the PA1's. Check the speaker wires and connections at the speaker terminals. Be sure that there is a signal cable plugged into the *main input*.

Weak or distorted sound Try another

determine if the problem is in the PA1. Check for loose screws in the dual ban connectors at the speaker terminals. Check and connections. Be sure *pre/spr* switch correctly.

If you hear distortion, be sure that the switches are in the correct position for use. Check the PA1 *level* control setting increase them if necessary. Finally, be sure not simply overdriving the PA1's. Turn down level until the distortion disappears.

Be absolutely certain that the PA1's receptacle plug is in the speaker's mid/high frequency terminal pair, and that the black dual-ban the low frequency (left hand) terminal pair that the *GND* rib pin is in the black each pair.

Weak or distorted sound Try another input source to determine if the problem is in the PA1 or the source. Check for loose screws in the dual-banana plug connectors at the speaker terminals. Check all switches and connections. Be sure *pre/spkr* switch is set correctly.

If you hear distortion, be sure that the PA1 *pre/spkr* switches are in the correct position for the source used. Check the PA1 *level* control settings and increase them if necessary. Finally, be sure that you are not simply overdriving the PA1's. Turn down the source level until the distortion disappears.

Be absolutely certain that the PA1's red dual-banana plug is in the speaker's mid/high frequency (right hand) terminal pair, and that the black dual-banana plug is in the low frequency (left hand) terminal pair. Also be certain that the *GND* rib pin is in the black binding post of each pair.

Warning: Do not remove the PA1's cover. There are no user serviceable parts inside.

Normal PA1 maintenance includes keeping the unit clean and dust-free. Use a soft cloth or brush to remove dust without scratching or marring the finish. Do not use strong cleaners or solvents of any kind.

Do not allow any moisture to enter the PA1. Wipe up any spills immediately. If you suspect that moisture has entered the PA1, take it to an authorized ADS service agency for assistance.

It is a good idea to periodically operate all of the switches and controls, especially ones that are seldom used, to keep contacts clean and noise-free. Every few months, turn the system power off and operate each switch or control several times.

Because the normal circuit function of the electronic crossover in the PA1 alters some amplifier performance specifications, those altered have been measured after bypassing the crossover section and driving the two power amplifiers directly. These specifications are marked with an asterisk *. Otherwise, the specifications are determined using the front panel *main input* jack and electronic crossover of the PA1. Although designed for dedicated operation with matching ADS loudspeaker systems, measurements of the PA1 with two common load impedances are included to aid in comparisons.

	Low frequency amplifier	Mid/high frequency amplifier
Frequency response, +1.5, -3 dB, at 1 Watt into 4 or 8 Ohms, through crossover, <i>bass eq</i> control at 0	10Hz-300 Hz	300Hz-200kHz
* Frequency response, +0, -3 dB, at 1 Watt into 4 or 8 Ohms	5Hz-200kHz	17Hz-200kHz
* Power test measurement bandwidth, reflecting actual use conditions	20Hz-500Hz	250Hz-20kHz
* Continuous average power output, both amplifiers driven in their respective bands, with no more than 0.05% THD	120 Watts into 4 Ohms 90 Watts into 8 Ohms	70 Watts into 4 Ohms 60 Watts into 8 Ohms

* Continuous average power output, each amplifier driven alone, with no more than 0.05% THD	150 Watts 4 Ohms 105 Watts 8 Ohms
* IHF dynamic headroom	3.0 dB in 4 Ohms 14 dB in 8 Ohms
* Damping factor, into 8 Ohms	>100
* IHF slew factor	>5
* Rise time	<2 μ S
* IHF signal to noise ratio	>90 dBA
* IHF maximum input signal, level control at -6, <i>bass eq</i> control at 0, with 8 Ohm loads	Input SWL pre: 2.8 V Input SWL spkr: 28 V

Continuous average power output , each amplifier driven alone, with no more than 0.05% THD	150 Watts into 4 Ohms 105 Watts into 8 Ohms	100 Watts into 4 Ohms 75 Watts into 8 Ohms
---	--	---

IHF dynamic headroom	3.0 dB into 4 Ohms 14 dB into 8 Ohms	3.0 dB into 4 Ohms 2.0 dB into 8 Ohms
-----------------------------	---	--

Damping factor , into 8 Ohms	> 100	> 100
-------------------------------------	-------	-------

IHF slew factor	> 5	> 5
------------------------	-----	-----

Rise time	< 2 μ S	< 2 μ S
------------------	-------------	-------------

IHF signal to noise ratio	> 90 dBA	> 90 dBA
----------------------------------	----------	----------

IHF maximum input signal , level control at -6, bass eq control at 0, with 8 Ohm loads	Input switch at <i>pre</i> : 2.8 VRMS Input switch at <i>spkr</i> : 28 VRMS	Input switch at <i>pre</i> : 2.4 VRMS Input switch at <i>spkr</i> : 24 VRMS
---	--	--

IHF sensitivity , level control at +6/-6, bass eq control at 0, with 8 Ohm loads	Input switch at <i>pre</i> 0.07/0.28 VRMS into 20 k Ohms Input switch at <i>spkr</i> 0.7/2.8 VRMS into 600 Ohms
---	--

Level control range	-6 to +6 dB
----------------------------	-------------

Bass eq control range	0 to +6 dB at 25 Hz
------------------------------	---------------------

Amplifier input/output phase	Non-inverting
-------------------------------------	---------------

Dimensions	295 mm/11.6" h x 238 mm/9.4" w x 106 mm/4.2" d
-------------------	--

Weight	Shipping weight for box of two PA1's, 15 kg/34 lb.
---------------	--

Power requirements	120 VAC, 60 Hz, 500 Watts maximum
---------------------------	-----------------------------------

ADS, Analog & Digital Systems, Inc.

One Progress Way
Wilmington, Massachusetts 01887
617 658-5100

Printed in USA
319-0064 584