

**Owner's
manual**

Models:

P300

P600

P1200

P2000

**The
PS Audio
Power Plant**

Thank
you

Thank you for your purchase of the PS Audio Power Plant.

Your confidence and trust in our company and in our products, as evidenced by your purchase, means a lot to us.

PS Audio was founded in 1974 by Paul McGowan and Stan Warren. Then, as now, we dedicated the company to the design and manufacture and support of affordable, high-end audio and video products. These are products that rely on sound engineering and innovative design to achieve our goals. In 1998, Paul McGowan acquired sole ownership of the name, and began to build PS Audio International, as it is now known.

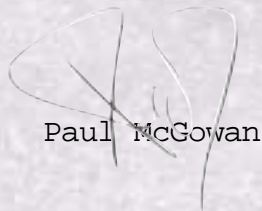
The Power Plant series represents the first of many products to be produced by PS Audio International.

All PS Audio products are sold with a full 30-day money back guarantee to the original purchaser (not including shipping in either direction). If, for any reason whatsoever, you find that a PS Audio product is not living up to your expectations, and would like to return the unit for a refund, please feel free to do so by contacting our customer service department, toll free, at 877-772-8340. You will be given a return authorization number and instructions for the return.

Our goal is not only your satisfaction, but also your eager support of the company and its products. We are extremely proud and enthusiastic about what we make, and we want the world to share in those feelings and to spread the good word. It's important to us.

So, if there is absolutely any way that we as a company, or I as the President of the company, can help you, do not hesitate to contact us immediately.

Good listening!



Paul McGowan

President
PS Audio International

The PS Audio Power Plant series is designed to provide clean, safe, low-distortion, low-impedance, regenerated AC power for your audio and video equipment.

There are four models, the P300, the P600, the P1200, and the P2000. Each model has the same features and functions, but they differ with respect to output power. The model name indicates the output power in watts; the P300 is a 300-watt unit, the P600 is a 600-watt unit, the P1200 is a 1200-watt unit, and the P2000 is a 2000-watt unit.

The P300 was designed for all low and medium power applications such as CD players, D to A processors, televisions, projectors, tuners, etc. The P300 was not designed for power amplifiers, integrated amplifiers, or receivers with output greater than 50 watts per channel.

The P600, P1200, and P2000 were designed for powering medium to large power amplifiers, as well as all low-level equipment.

The Power Plant is not a filter or line conditioner. Rather, it is a regenerative AC synthesizer. The Power Plant receives AC energy from your home's wall socket, converts it to DC (Direct Current, which is the same as a battery voltage), then converts it back to AC without any noise or problems.

The essential elements inside the Power Plant are:

- An input AC transformer.
- High-voltage MOV protection devices.
- AC to DC conversion, via high-speed diode bridge and multi-thousand mfd capacitors.
- DSP-based, multi-frequency, programmable sine wave oscillator.
- A stereo power amplifier, ranging from 300 watts to 2000 watts, depending on the model of Power Plant.
- Microprocessor-controlled front panel display and functions.

There is an optional display board available for all models of the Power Plant. This optional display board is a user-installable board that replaces the existing front panel display board. It provides a distortion analyzer, graphic oscilloscope, digital rms voltmeter, and a digital distortion analyzer. If you have purchased the display board for your new Power Plant, the instructions for its installation are included with the display board kit.

The output of the PS Audio Power Plant produces regulated, balanced, 115 volt AC power (domestic model) or 230 volts AC (export model). All Power Plants, domestic and export, can be set to the appropriate input voltage: 120 volts (US, Canada, Taiwan) or 220 volts (Europe, Asia). The user may select the appropriate voltage via an internal selection switch. Details are available in the setup section of this manual.

Step 1

Remove from packaging.

The Power Plant will arrive in a single container that is made with three elements: an outer shipping carton, an inner shipping carton, and a protective sleeve.

Remove each of the three elements to expose the Power Plant. Be certain and save all the packing material in case you ever need to ship the Power Plant back to us.

Check that all items listed below have been included in your Power Plant package:

- The Power Plant
- The detachable AC line cord
- The owner's manual
- A brochure

Step 2

Placement of the P300.

Place the P300 in a reasonably well-ventilated area, close to the low-level items you intend to power. It may be placed inside a cabinet, or on the floor, behind your equipment. (It is permissible to leave the Power Plant on, and turn your equipment on and off from the equipment's power switch or a remote control.)

Placement of the P600, P1200, P2000.

If you are planning to use the P600, the P1200 or the P2000 to power both a power amplifier(s) and a number of lower power units simultaneously, it is advisable to purchase the PS Audio Extension Link. The Extension Link provides an additional eight hospital grade outlets, and allows you to place the Power Plant near the power amplifier and to use the Extension Link to remotely power your other equipment.

Most people will find it convenient to place these larger Power Plants on the floor, or on a large shelf. In any case, do not place these larger units inside a cabinet, unless it is well ventilated. The P600, P1200, and certainly the P2000, produce a great deal of heat.

It is not advisable to use an extension cord for a power amplifier, unless it has at least a 12-gauge cord.

Step 3

Adjust the voltage to match your country.

This is a critical step. Power Plants are shipped set for 120 volts AC. If you live in North America, Canada, or Taiwan, **you need not change anything.** If you live in the rest of Asia, Australia, or Europe, please refer to the more detailed setup guide to learn the procedure for changing the voltage.

Step 4

Plug in your equipment.

Important: the P300 model was never intended for power amplifiers, integrated amplifiers, or receivers that produce more than 50 watts per channel. Equipment that produces more than 50 watts per channel should not be plugged into the P300.

Make sure that the Power Plant, and each piece of equipment to be plugged into it, is switched OFF, then plug the equipment into the outlets on the back of the Power Plant.

Step 5

Plug the Power Plant into a live AC receptacle, and switch it on.

Use the included power cord, or another of your choice. We do not recommend the use of any power cords that contain filters. Using the lower left-hand button on the Power Plant's front panel, switch on the Power Plant.

Step 6

The Power Plant's display will now read "60".

This is the frequency the Power Plant is producing. You may raise or lower this frequency by using the two Up/Down buttons located to the right of the display on the P300; below the display on all other models.

CAUTION: if you are powering a turntable, tape deck, or anything with an AC synchronous motor, do not raise the Power Factor frequency above 60 Hz. This can damage your motor. CD players and DVD players do not have AC synchronous motors, so they are not a problem. If you are uncertain about what you have, contact the manufacturer for instructions. You can briefly experiment by raising the frequency and listening to your motor for signs of trouble. If you hear any unusual noises from the motor, switch off the Power Plant, or return to the lower frequency. A short period of operation, at the higher Power Factor, should not damage the motor.

Experiment with different Power Factor settings once you have familiarized yourself with the basic performance of the Power Plant. There are 10 Power Factors; each higher level of PF will increase the Power Plant's output frequency as displayed on the front panel. After you measure the wattage, following step number 7 of this quick start guide, press the Mode button again to return to the Power Factor control. Use the Up/Down buttons located on the right side of the display on the P300; below the display on the other models, to change the PF.

Step 7

Switch on each piece of gear, one at a time, until all pieces are powered.

Push the Mode button once to activate the wattage meter on the display. Watch the front panel of the Power Plant as you do this. Should an amber light illuminate, or should the Power Plant shut off at any time during this initial turn-on phase, please refer back to the more detailed setup guide for instructions. Refer to the section labeled "Plug in one piece of gear after another, measure total wattage."

If there is no amber light, and the Power Plant is still operating, you are ready to roll. We suggest that you read the sections on what to expect, what not to expect, and listening tips. However, you may certainly proceed to the enjoyment phase of the Power Plant at this point. Good listening and viewing!

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Remove from packaging.

The Power Plant will arrive in a single container that is made of three elements: an outer shipping carton, an inner shipping carton, and a protective sleeve.

Be certain to save all packing material in case you ever need to ship the Power Plant back to us.

Position the Power Plant.

The P300 is rather easy to locate appropriately; the P600, P1200 and P2000 models may be more difficult.

P300.

The P300 was designed, primarily, for low-powered items such as CD players, preamplifiers, DAC's, video processors, and so forth. It was not designed to power anything greater than a 50 watt per channel power amplifier, or integrated, or receiver.

Place the P300 in a reasonably well-ventilated area, close to the low-level items you intend to power. In many applications this will be on a shelf alongside your other equipment. It may also be placed inside a cabinet, if that is more convenient. In other instances, you may wish to place the Power Plant on the floor, behind your equipment.

It is permissible to leave the Power Plant switched on continuously.

P600, P1200, P2000.

These larger units were designed with two purposes in mind: powering small to large power amplifiers and/or other lower power units at the same time. If you wish to use the P1200, the P600 or the P2000 to operate both a power amplifier(s) and a number of lower power units simultaneously, it is advisable to purchase the PS Audio Extension Link. The Extension Link provides an additional eight hospital grade outlets, and it allows you to place the Power Plant near the power amplifier and to use the Extension

Link to remotely power your other equipment.

Do not place these larger units inside a cabinet, unless it is extremely well ventilated. The P600, P1200 and P2000 produce a great deal of heat.

It is not advisable to use an extension cord for a power amplifier, unless it has at least a 12-gauge cord.

Adjust the voltage to match your country's standard.

The Power Plants are shipped ready to operate on 120 volts AC. This voltage is the standard in most of North America, Canada, Taiwan, and parts of South America. Most of the rest of the world is running on 220 volts AC to 240 volts AC. If you live in North America, Canada, or Taiwan, there is nothing to change.

If you live in Europe, mainland Asia, Australia or a part of South America that runs on 220 volts AC, you must first change the voltage to the appropriate level to match your country's standard.

To change the input voltage, **disconnect the Power Plant from the wall socket first!** Next, on the PS Audio P300 Power Plant, remove the bottom plate; on the P600, P1200, or P2000, remove the top plate.

Locate the voltage change switch. Move the switch to the appropriate voltage.

Note for P2000 owners: you must have at least a 20-amp, 120-volt AC dedicated circuit available for the P2000, preferably a 30-amp circuit. If a 220-volt AC line is available, this would be even better. Contact PS Audio customer service, or your dealer or distributor, if you have any questions.

Choose a power cord.

The power cord used to operate the Power Plant, as well as the power cords that connect up each piece of equipment, are important elements in your quest for great performance.

We recommend the PS Audio Power Link AC cord, which has been specifically designed for use with the Power Plant. If you choose another AC cord, we strongly recommend that it includes no built-in filtering of any kind. That is, no ferrite beads, no networks built into boxes attached to the power cord, etc. The extra filtering provided on some high-end power cords will be detrimental to the performance of the Power Plant by raising the impedance and causing phase shift.

Do not, under any circumstances, plug a power conditioner into the outputs of the Power Plant. This will raise the output impedance, cause phase shift, and compromise the Power Plant's performance.

Plug in one piece of gear after another, measure total wattage.

Make certain that the Power Plant is plugged into the wall socket, but that its power is switched off.

Plug in all the gear you wish to power, making certain that its power is all switched off, too.

Using the Power-on button of the Power Plant, located on the lower left-hand side of the front panel, switch on the Power Plant. The front panel display will read Power Factor "60". This indicates 60 Hz operation.

Press the Mode button, located on the middle left side of the display on the P300; below the display on the other models. It is labeled "Mode". The "60", formerly displayed in the front panel window, will now read directly in watts.

Selectively switch on each device connected to the Power Plant, adding one at a time, while simultaneously viewing the wattage monitor on the Power Plant's front panel. The monitor will display an increase in the wattage being used each time you switch on another piece of gear.

The maximum allowable wattage is 300 for the P300, 600 for the P600, 1200, for the P1200, and 2000 for the P2000. At approximately 75% of the available wattage, an amber light will illuminate on the left-hand side of the display. This is the headroom-warning indicator, signaling your approach to the Power Plant's rated wattage. You may use the Power Plant when the amber warning light is lit without a problem. It is merely a visual indicator.

Power Factors.

Power Factors are an exclusive, patent-pending feature of the PS Audio Power Plant. The Power Factor feature selectively raises the output frequency of the Power Plant from a low of 50 Hz to a high of 120 Hz. By increasing the Power Factor your equipment's power supply will become more efficient; capacitors become larger, radiated magnetic fields become smaller. Sonically, you will experience an increase in depth and width of the soundstage.

The Mode button, located on the left-hand side of the display on the P300; below the display for all other models, allows you to choose between the Power Factor feature, and the wattage meter feature. Power Factors can be raised and lowered via the Up/Down buttons, located on the right-hand side of the P300; below the front panel display for all other models.

CAUTION: if you are powering a turntable, tape deck, or anything with an AC synchronous motor, do not raise the Power Factor frequency above 60 Hz. This can damage your motor. CD players and DVD players do not have AC synchronous motors, so they are not a problem. If you are uncertain about what you have, contact the manufacturer for instructions. You can briefly experiment by raising the frequency and listening to your motor for signs of trouble. If you hear any unusual noises from the motor, turn off the Power Plant, or return to the lower frequency. A short period of operation, at the higher Power Factor, should not damage the motor.

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What to expect

After an extensive period of listening to the Power Plant in different systems, we have gained a lot of experience, and will attempt to summarize those listening experiences as follows:

Increased depth.

Listen to a good recording that has some measure of depth that extends from the speaker plane to behind the speaker plane; you should notice greater depth when powered by the Power Plant. That depth should further increase if you raise the Power Factor frequency from 60 Hz to a higher frequency, but it should be noticeable even with the Power Plant in service at its 60 Hz setting.

Increased instrumental space.

With careful listening, you will notice that each instrument and each voice has an allotted area with respect to the other instruments that share the sonic stage. We notice a major increase of that space with use of the Power Plant, so that instruments sound more "you are there," more three-dimensional.

Better bass.

The bass on recordings should sound tighter, fuller, and in many cases, actually extend lower, as if you removed a high-pass filter (bass cutoff) from your system. This effect has ranged, in our experience, from subtle to extraordinary. Try listening with and without the Power Plant in the system.

Less "tinny" quality.

Many recordings, even when played on fine, high-end systems, tend to sound strident or harsh relative to live unamplified music. Our experience is that with use of the Power Plant, much of that "tinny" sound vanishes and is replaced by a richer, sweeter sound. Effect ranges from subtle to huge.

Greater slam and impact.

Power conditioners rob your system of life; the Power Plant renews life. By "life" we refer to the energy and tran-

sient dynamics found in music, which can also be described as slam and impact, commonly associated with drums, quick bass attacks, and quick transient voices. It should appear that we have removed a "veil" from your system, with respect to dynamic range.

Video.

When connected to a television, or a video projector, the Power Plant can make a stunning visual difference.

Deeper, richer blacks, better edge definition, and a clearer, more film-like presentation can all be expected.

We do not recommend use of higher Power Factors for video.

A note about listening.

All Power Plants sold as new from either PS Audio or your dealer come with a 30-day money back guarantee. Exceptions to this may include a distributor within a particular country.

To some of you, in fact to many of you, one demonstration of the Power Plant in your system will be all you'll need to determine if it is indispensable. Plug it in, listen, and that's it. But for others, it may be a bit more difficult to make such a determination. I understand. I've done listening tests with equipment most of my adult life. So, I can usually sit down and judge the merits of something in a few minutes.

Here are a few tips from a guy who's been around the block a few times:

Don't expect too much.

Sometimes we build ourselves up to expect that something will sound so different that we're disappointed if it is still the same cut of music. Keep your expectations realistic.

Differences can sometimes be more noticeable AFTER you go back to what you started with. I have noticed that I can listen to the standard system, put the new unit I'm evaluating in the sys-

tem and live with it a bit, but not be too impressed until I go back to where I started from and THEN realize how big a difference there was.

Although it is always best to use the same track of music to evaluate performance, don't wear out that track and yourself. It is important to choose a piece of music and familiarize yourself with how it sounds on the system with no DUT (Device Under Test) in place. Stop, add the DUT, then listen to the same music and note the differences.

Often I do this with the same cut, and become numb to the differences. Once you think you've noted some changes, play two or three other, familiar cuts to confirm the changes.

Keep the volume is identical!

A common mistake is not having exactly the same volume level for the two parts of the test. This may be particularly hard with the Power Plant, because it requires you to switch off your equipment each time you activate the Power Plant. I have an Audio Research pre-amplifier that "forgets" its volume setting whenever it is unplugged. So, I count the number of clicks that it takes to set the volume, write that number down, then easily reset volume when I return.

Enlist a friend.

Another opinion is always valuable to backup yours, or maybe your friend will notice things you have not. I ask a friend to switch Power Factors for me, for instance. Here are my rules: I don't want to know WHERE you switch, just WHEN you switch. Suppose I ask my associate to switch between 60 Hz and 120 Hz. I ask for position "A" (he points upwards), position "B" (he points downwards). I take notes. On three different pieces of varying music, I preferred B to A. "OK," I ask, "which setting was B and which was A?"

I guess it's important to be as scientific about the evaluation as possible. But, don't get so scientific that you forget that

listening is a sensual art.

Sometimes the music is of such a complex nature that it is difficult (at best) to clearly define the individual nuances that make up the differences between the familiar system and the DUT.

Remember too, listening properly for changes can be as simple as "I don't know, it just sounded better!" That's OK too.

A list of things we would like you to know:

Power Factors.

We have noticed, on some pieces of stereo equipment, that their internal power transformers buzz or "sing" when the higher Power Factor frequencies are activated.

After you've made your evaluation of the effects of the Power Factor increase (sonically), turn the music off then raise and lower the frequency to see if your equipment also makes a mechanical noise that is objectionable to you. The possible noise I refer to does not come out of the speakers; if present, it will emanate from the unit itself.

If you do hear such a noise, note how close to the unit you must be to hear it. (It may be wholly inaudible from your listening position.) Also, raise and lower the Power Factor control through each step. In many instances, we have found that the unit's transformer will "sing" at one frequency, but that it will stop at the very next frequency. Experiment to find which Power Factor works best with respect to sound and to the lowest level of transformer "sing" possible. The "singing" transformer phenomenon is not at all harmful to your unit.

Plugging in vs. switching on.

A potential problem area is method of switching on. We prefer that you first switch the Power Plant on (or leave it on), then switch on each piece of equipment, one at a time. Example: I have a CD player and a DAC unit plugged into the Power Plant. The Power Plant is on.

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I use the front panel power switch of the DAC to turn it on, then I switch on the CD player. This is the best method.

Try different power cords.

While we have implied, time and again, that the Power Plant is impervious to line conditions, that claim is not 100% correct. The small gray area has to do with input power cords, which seem to make a sonic difference. Try using the PS Power Link, instead of the supplied power cord. The Power Link will make a beneficial sonic difference.

Do NOT use an extension cord on the Power Plant.

Do NOT use an extension cord on the output of the Power Plant, if this can possibly be avoided. There is no danger of any kind, but an extension cord might degrade the performance of what's plugged in.

Do NOT use an outlet extender (to add more outlets) unless that extender has NO protection or filtering.

The use of ANY filtering on Power Plant outputs will defeat its purpose. This means that you should never attach a power conditioner, filter, or power device of any kind to an output of the Power Plant.

Do not use a power conditioner on the Power Plant's input.

We do not recommend the use of a power conditioner on the input of the Power Plant. This may or may not affect the quality of power coming out of the Power Plant. To date, our experience has been a rather negative one with respect to this matter.

Experiment if you wish, but please assume the worst.

Mixing analog and digital audio/video.

We believe that it is OK to mix digital and analog devices on the same Power Plant with good results. In fact, the

results are better than with any other device we have ever encountered. But, is this the ultimate no-compromise situation? No. It is best, in a cost-no-object situation, to separate digital and analog signals, as well as video, into separate Power Plants.

Theory of operation.

The Power Plant is a regenerative AC synthesizer. It accepts the AC wall voltage of either 120 volts or 220 volts AC. The AC is then stepped up (or down) to 143 volts AC to allow enough headroom for the voltage-regulation element of the Power Plant. Step up/down is accomplished through the use of a balanced input transformer.

Multiple and redundant 4500-volt MOV's are placed across the primary to offer surge and spike protection.

The AC voltage then passes through a 50-amp diode bridge for rectification, and is then filtered by a bank of 3300-mfd 100-volt capacitors. This forms the DC power supply.

The DC power supply, producing plus and minus 103 volts DC, is then applied to two power amplification stages. These amplification stages are class AB power amplifiers, featuring an input differential pair, gain stage, driver pair and multiple outputs.

The power amplification stage is fed by a DSP-based sine wave oscillator whose input frequency is microprocessor-controlled and selected via the front panel buttons.

Sine wave generation.

Near perfect, low distortion sine waves are generated by a custom-designed circuit. This generator is constructed with a microprocessor-based sine wave look-up table, feeding into a 12-bit D to A processor, which outputs into an analog filter to remove the sampling frequencies. The sine wave generator is capable of 0.03% distortion levels, total THD

and IM, for any frequency selected on the front panel. This output is then fed into two, high-voltage operational amplifiers, powered from a separate plus and minus 25-volt supply, producing 10 volts rms AC, in phase and out of phase.

Amplifier description.

There are two power amplifiers in the Power Plant. Each produces 57.5 volts rms AC at its output, for a total of 115 volts rms between the two balanced outputs. The two amplifiers form a balanced bridge that is used to feed the AC receptacles on the rear of the Power Plant.

Input.

Bipolar differential pair, biased with an active dual-device current source for maximum linearity. The differential pair has a dual-device current mirror feeding it to increase gain, lower distortion, and provide perfect balance.

Gain stage.

One leg of the current mirror is used to feed the base of a pnp gain stage, which is fed by an active current source. We chose to incorporate this topology, rather than any number of other possibilities, because we felt this offered us the highest linear amount of gain with minimal componentry.

Current amplification.

The gain stage feeds a bipolar complementary driver stage, separated by a thermal circuit which actively adjusts the output stage current in a manner commensurate with the transistor's safe operating area vs. heat. The driver stage feeds a complementary parallel output stage, and the entire signal is then fed back to the inverting input of the differential pair in a loop feedback scheme.

Catastrophic protection.

The output stage is ultimately protected from an over-current situation by the catastrophic sensing circuit. An opto-isolator is placed across the emitter resistors

of the output stage. When a predetermined voltage drop is developed across the emitter resistor, the opto-isolator fires and sends a signal to the Power Plant's microprocessor, signaling for an immediate shut down of the power activation relay. A front panel LED is also activated by the microprocessor to indicate to the customer that a fault condition has occurred.

Current clamp.

On the driver side of the current amplification section, we have placed a unique current clamp. Should the current draw exceed the acceptable limits, based on a predetermined time function, the active clamps will conduct and limit the current drive to the output stage. This protection scheme is useful when attempting to drive an extremely reactive load, or a large turn-on inrush current. It is convenient because it allows the Power Plant to "soft start" a large transformer/capacitor combination without shutting down, and without damage. In essence, it is a limiter.

Soft sensing.

Using a small isolation transformer, connected across one of the output stage emitter resistors, we isolate and then monitor the real time current draw produced by the Power Plant as it feeds a load. The AC from the isolation transformer is rectified, then filtered, to produce an average level. That level is then fed into an A to D converter, and the digital information is fed into the on-board microprocessor. The microprocessor can then easily calculate the average rms current, as delivered by the Power Plant to its load, and then display that information on the front panel of the Power Plant when the Mode button has been instructed to do so. Further, the microprocessor has been programmed to shut down the Power Plant when an over-10% (of rated power) condition is present.

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Service

Service

Should your Power Plant require service, please contact your dealer, distributor, or our service department.

PS Audio service and technical assistance:

Email: rcullen@calinet.com
Telephone: 805-461-1213
Fax: 805-461-0432

Mail: PS Audio Service Center
8793 F. Plata Lane
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To contact PS Audio customer service center:

Email: through our web site at <http://www.psaudio.com>
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