PASS™

XP-27 Owner's Manual

INTRODUCTION:

Pass Laboratories, specifically Nelson Pass and his co-designer, Wayne Colburn have a long history of imagining and successfully bringing to the discriminating consumer some of the finest phono stage pre-amplifiers ever offered. Each new incarnation of the Pass Laboratories phono preamps has pushed their personal limits as to what level of acoustic bliss is realistically achievable from "Streaming Analog"©.

Since 1997 the guiding credo for these phono pre-amps remains the vision that music must flow effortlessly from LP surface to listeners ear. With each evolution of product that effortless flow should issue forth with greater detail and clarity while never forgetting or sacrificing the soul of the music and the artistic intent. The Pass Laboratories XP-27 does not disappoint.

The XP-27 was brought to market both by copious measurements and extensive listening through a multitude of tone arm and cartridge combinations. Listening was given precedent over the numbers but never at the expense of measured performance. The result is a dynamic, lush and smooth sound with dramatic detail and spectacular layering. Those listeners familiar with Pass Laboratories previous phono pre-amps will be struck by the clear delineation of bass notes in the XP-27 and the greater sense of music in a real physical space.

Like some great musicians we get requests! You spoke and we listened… so that you can listen better. Now the XP-27 a product designed at the intersections of excellence, adaptability and convenience.

The twin chassis XP-27 eclipses the already exceptional performance of the well-reviewed and well-received XP-15, XP-25 & XP-17: delivering enhanced RIAA performance at a fraction of the previous distortion. With the XP-27 you are going to discover a whole new dimension of dynamics, inner detail and spectral richness on your favorite LP's.

The XP-27 brings all control and cartridge loading functions to the front panel and presents them in a clear easy to understand layout. The XP-27 boasts two separate and selectable inputs, ample adjustable gain along with generous resistive and capacitive loading choices.

Those listeners and archivists with the desire or need to sample music from two tone-arms or turntables will be able to do so

instantly with a single XP-27, thus simplifying their complement of analog equipment and removing one more variable from their listening chain.

The addition of a user selectable high pass (low cut) filter makes possible the playing of recordings with excessive subsonic information.

The addition of a user selectable mute control makes possible the cuing of records and needle drop in absolute silence.

The XP-27 is an uncommonly fine match with very low output moving coil cartridges which would normally require a transformer first stage.

By the early 1980's it was generally acknowledged that lower output moving coil cartridges were capable of retrieving significantly more fine detail from record grooves than higher output moving magnet cartridges. In many instances this was simply a case of having lower moving mass to accelerate in the electrical generator mechanism of the phono-cartridge. Moving coils with 3 or 4 turns of the finest wire attached to the lightest and stiffest cantilevers were capable of accurately tracking complex musical passages that a few years prior would have seemed impossible tasks to engineer and listener alike.

The really astute cartridge makers had clearly taken a page from the automotive and motorcycle racing cognoscenti, whose engineers were doing everything in their power to lower "un-sprung mass" in an effort to get tires to say in intimate contact with the roughest terrain at the highest possible speeds. In both worlds the ability to accurately track the impossible landscape is the ultimate goal….. minimal moving mass associated with a compliant suspension is a big part of the answer.

Unfortunately the active electronics that were capable of extracting signal at those low levels, frequently then buried much of that signal in their own noise floor. Step-up transformers generally addressed the noise issues, but frequently lost the very fine detail somewhere in the transformers iron core. For the time, the promise of the best moving coil cartridges went un-realized

The XP-27's high gain and exceptionally low noise figure allow for ample output and detail from cartridges providing as little as 40 uV (micro-volts) of signal at the phono input.

The adjustable gain options of the XP-27 make this unit immune

from overload with any high output cartridge of which we are familiar.

The XP-27 is as much a pleasure to use as it is to listen through, thank you for trusting your ears and your vinyl collection with us. Before you sit back and listen, take time to read and understand cartridge loading. When you find the desired setting, please record that setting so that you can come back to it in the future. For your convenience we left space at the end of this manual for just these sorts of details.

TECHNICAL DETAILS:

As previously indicated the XP-27 is a twin chassis design. One chassis holds the fully filtered and regulated power supplies and the second chassis houses the analog gain circuits, input switching, loading and all those details and features normally associated with a reference RIAA phono stage.

The two chassis are interconnected with 9 conductor cable. This cable only carries power, never analog signal.

Consumers frequently ask us if they may substitute a cable of their choice for the one Pass Laboratories supplies. The answer is yes, provided that cable carries all the necessary legal approvals.

Never attach or detach the 9 pin cable with the power supply, powered up from the wall. Always unplug your XP-27 from line voltage prior to attaching or removing the cable.

If you substitute an aftermarket power cord you need to be aware of the following. The ground pin on the power cord provides this product's safety ground, for your safety and the integrity of this product the safety ground must never be defeated. Additionally this product has filter components in the AC line that are designed to shunt unwanted noise from the power-line to ground. Defeating the safety ground will ultimately defeat some of the performance advantages built into this product.

To insure maximum performance and maximum safety use only power cords that are grounded and carry all the necessary approvals and directives from the local regulating authorities.

Lets talk about AC power requirements. Your new XP-27 is built voltage specific to your market. Line voltage is determined at the

time of construction and is not changeable. The products voltage and current requirements will be indicated on a tag affixed to the rear panel of the XP-27's power supply chassis. This tag will indicate a nominal 100 volts, 120 volts, 220 volts, or 240 volts with allowances for normal variations of the nominal indicated build voltage.

The AC Line Voltage in all instances will be 50 - 60 Hz. Please verify that that voltage indicated on the product is consistent with the nominal voltage supplied at your location.

All XP-27 products are protected by a voltage specific type fuse (5mm x 20mm slow blow). For 100 Volts ac and 120 Volts ac the fuse will be 1 amp, for 220 Volts ac and 240 Volts ac the fuse will be ½ amp. In all instances the fuse will have a slow blow time constant. Substitution of another time constant other than "slow blow" at the same amperage will not harm this product, but we would not expect longevity from the fuse element. It is not suggested that you substitute any other fuse type or fuse rating, deviation from the indicated physical size of fuse (5mm x 20mm) may cause significant physical damage to the fuse holder and put the product and your safety at risk.

ADJUSTMENT:

In order to set the XP-27 in a way which optimizes the performance of your phono-cartridge it will be helpful though not absolutely necessary that you have some information and set up suggestions on that specific cartridge. If you do not have data on the cartridge and do not wish to re-invent the wheel, contact the dealer or the Pass Laboratories factory. We will attempt to help you with that data, but by no means do we have data for every cartridge arm combination ever built.

At the bare minimum you should know and have set the suggested optimal tracking force for the cartridge and have already set the overhang and vta as per the tonearm makers instructions, anti-skate and azimuth if possible.

The usual procedure is to select input jacks on phono pre-amps based on cartridge type, Moving Magnet or Moving Coil. As previously indicated the XP-27 is not typical and is designed to simplify your life. With the XP-27 cartridge types will be accommodated by gain and loading selections from the XP-27 front panel.

In general MM (moving magnet) cartridges will require a gain

setting of 53 dB, MC (moving coil) a setting of 66dB or 76dB. Moving Iron cartridges, usually 66dB. However there are no fixed rules, the requisite setting is that setting which works best in your situation. Some listeners will select gain based on a sonic preference others simply will choose a setting that brings their phono system output on parity with their other source components. Either choice is equally valid.

Moving magnet and moving iron cartridges typically work very well with a series loading of 47k-ohms and 100 pf of parallel capacitance. Like gain, these settings too are selectable from the front panel of the XP25. Presuming 47k-ohm in the case of moving magnet, greatest benefit comes from exploring the pallet of available capacitive loading choices. Infrequently moving magnet cartridges will perform best at other than 47k-ohm but that would be an exception. Moving Iron cartridges typically load @ either 47K or 1K ohms.

Moving Coil cartridges frequently do best with lower impedance loads and see little advantage from additional capacitance. From the front panel your choices of cartridge loading will be as follows:

Resistive loading choices; 30 ohm, 50 ohm, 100 ohm, 160 ohm, 250 ohm, 320 ohm, 500 ohm, 1k-ohm, 47k-ohm
Reactive loading choices; 100 pf, 200 pf, 320 pf, 430 pf, 530 pf and 750 pf.

If you have other than a moving coil cartridge, please take time to read the short treatise on moving coil cartridges, the philosophy and exercise of how one might go about adjusting for a particular cartridge is not exclusive to the moving coil.

While the loading of moving magnet cartridges is rather straight forward, the loading of moving coil cartridges is at best a very inexact science. Specific requirements for loading moving coil devices should be taken (and offered) very lightly.
The XP-27 is not typical and I encourage you to think separately from the cartridge manufacturer and choose your resistive loadings accordingly.

As for example with the very lowest output cartridges, the cartridge maker likely anticipated a transformer being used as the initial stage of gain, the XP-27 with its active elements is a very different proposition from a transformer as seen by the cartridge. This fundamental difference of circuit topology can affect loading preferences.

As an added complexity; part of the cartridge loading is always provided by the lead-in wiring. The XP-27 is sufficiently revealing such that the resistance and reactance of that wire should be accounted for in choosing loading values in the XP-27. As long as you derive your final setting empirically through careful listening you may ignore these wire effects; however your cartridge will not.

An improperly loaded cartridge will suffer every unwanted sonic anomaly, ranging from lack of definition and bass to a very strident and screechy high end.

Cartridge loading is a compromise between what works best for the cartridge and what sounds best for the listener. Specifically in selecting a cartridge load, we will be listening for a compromise loading which sounds best across the whole audio spectrum and specifically not that loading which optimizes one cut on one LP.

The front panel controls of the XP-27 load each channel of the phono-cartridge independently through closely matched devices to preserve the best possible spatial elements of recordings. The XP-27 is a dual mono design, which minimizes cross talk between channels. The loading resistors and capacitors are isolated from the front panel switches to provide the best possible signal to noise figures possible.

I suggest you start with the following for moving coil cartridges:

Always, ALWAYS reduce the volume or mute the output of your preamp before making any adjustments of the XP-27 cartridge loading. Load and input changes made to the XP-27 have a small but non-zero possibility of sending pulses to your pre-amplifier that could damage loudspeakers provided the volume of the pre-amplifier is set sufficiently high. Damage to your equipment is highly unlikely but in light of the effort and expense your equipment represents we believe that caution however un-necessary is warranted.

Start by selecting an initial resistive load of 100 ohms. Give the XP-27 electronics a couple of minutes to settle in and listen to the system critically for some time (10 minutes to 1 hour) using various musical selections that you are familiar with.

Once again reduce the gain on your preamp and select the next lowest resistive loading value (50 ohms) from the XP-27 front panel. Once again give the electronics a couple minutes to settle in and listen to the same musical selections as before. If your test selections sound better with the new 50-ohm loading you can

be assured that the loading change was in the correct (lower resistance in this example) direction.

If this second load selection resulted in an even more pleasant presentation of your chosen musical selections, select the next lower resistive value, 30 ohms, and listen to the same selections once again.

At some point you will find a value where the perceived sound deteriorates, move back to the last value that sounded excellent. Once this has been done, you have reached the apparent optimal resistive loading.

If going below 100 ohms resulted in degraded sound, then obviously the correct change would have been to have gone upward to 160 ohms, where you would repeat the listening test. I am sure you get the idea, it is not complicated, but it can be time consuming.

Capacitive loading follows the same rigor and affects the finer points of resistive loading. The final and optimal setting will require alternating between resistive and reactive loading elements, peaking each element in turn until no further gains are achieved.

Capacitive loading will not affect moving coil cartridges to the same extent that capacitive loading affects moving magnet cartridges but the effect may be worth considering and optimizing this parameter once resistive loading is optimal.

Again I would like to stress that you are listening for a musical balance in the selections that you play. Some loading selections will offer better bass but suffer from poor high-end resolution, some will have spectacular high-end definition but have a flat sound stage. You are seeking an optimal condition with correct spectral balance in conjunction with correct spatial information. The XP-27 equips you with the tools for the task. Finding the best compromise will however take time.

Do not make the mistake of setting the XP-27 such that it enhances one recording only, listen to a variety of well-recorded material and adjust accordingly. Avoid the folly of only auditioning and adjusting to your favorite LP.

Once you have found the optimal settings, take the time to record those settings, so that should the need ever arrive, you can replicate your personal best settings quickly and with minimal effort. Of course whenever your change cartridges or wiring between the

phono cartridge and XP-27 it would be wise to revisit your selected settings and make the requisite addition to your notes. Space is provided at the end of this manual to record those settings.

PRODUCT PHILOSPHY and DESIGN:

For a very long time there has been faith in the technical community that eventually some objective analysis would reconcile critical listeners subjective experience with a repeatable laboratory measurement protocol. Perhaps this will ultimately occur, but in the meantime audiophiles largely reject bench specifications as an indicator of audio quality. This is appropriate; the appreciation of audio is a completely subjective human experience. We should not more let the numbers define audio quality than we would let chemical analysis be the ultimate arbiter of fine wines. Measurements are certainly critical, they can and do provide a measure of insight, but are no substitute for human judgment of that which is pleasant.

As in art, classic audio components are the results of individual and collective efforts that reflect a coherent underlying goal and philosophy by the major participants. If successful, they make both a subjective and objective statement of quality, which is meant to illicit appreciation in the final product. It is essential that that the circuitry of an audio component reflects a philosophy which addresses the subjective nature of its performance first and foremost.

Lacking the ability to completely characterize performance in an objective manner, we should take a step back from the resulting waveform and take into account the process by which it has been achieved. The history of what has been done to the music is important and must be considered a part of the result. Everything that has been done to the signal is embedded in that signal, however subtly.

Experience correlating what sounds good to knowledge of component design yields some general guidelines as to what will sound good and what will not sound good in real life.

1) Simplicity and a minimum number of components is a key element, and is well reflected in the quality of better tube designs. The fewer pieces in series with the signal path, the better. This is often true even if adding just one more gain stage will improve the measured performance.

2) The characteristic of gain devices and their specific use is important. Individual variations in performance between like devices is important, as are differences in topological usage. All signal bearing devices contribute to the degradation, but there are some different characteristics that are worth attention. Low order nonlinearities are largely additive in quality, bringing false warmth and coloration, while abrupt high order nonlinearities add harshness.

3) Maximum intrinsic linearity is desired. This is the performance of the gain stages before feedback is applied. Experience suggests that feedback is a subtractive process; it removes information from the signal. In many older designs, poor intrinsic linearity has been corrected out by large application of feedback, resulting in loss of warmth, space and detail.

We give these precepts a great deal of thought in the design and voicing of product so that you do not have to. You only need to address the cartridge loading till it sounds good to you. Once set you can relax and focus on the results.

WARRANTY:

Please check with the factory authorized distributor in the country where you are purchasing this product for specific warranty information.

All Pass Laboratories products purchased new from an authorized Pass Laboratories dealer in North America are covered by a transferable, limited 3-year warranty. This warranty includes all parts and labor charges incurred at the factory or factory specified repair facility, exclusive of any subsequent or consequential damages. Damage due to physical abuse is specifically excluded under this warranty.

For this warranty to apply the customer is responsible for returning the product unmodified to the factory within the specified warranty period. The customer assumes all responsibility for shipping and insurance to and from the factory or a factory specified repair facility. The conditions and stipulations of this Pass Laboratories warranty only applies to units originally sold new through an authorized dealer. Warranty on factory repair is 60 days and covers only the scope of the original repair.

Non-North America customers should consult with their original Pass Labs dealer or distributor for warranty repair instruction prior to contacting the factory or shipping product to the factory for repair.

Non-North American product must be returned to the country of origin for warranty service. Foreign distributors are only required to offer warranty service on Pass Laboratories product that they have imported, verifiable by serial number.

Please note: Conditions of warranty service and customer rights for product purchased outside the United States may vary depending upon the distributor and local laws. Please check with your local distributor for specific rights and details.

Any modifications to Pass Laboratories products that have not received written factory approval nullify all claims and void all provisions of the warranty and liability by the maker or authorized distributor. Should a modified product be returned to the factory for repair the owner will be required to pay all necessary charges for the repair in addition to those charges required to return the product to it's original configuration.

In the case of safety issues, no product shall be returned to the customer without those safety issues being corrected to the most recent accepted standards.

Removal or alteration of original Pass Labs serial numbers voids the factory warranty. Product with altered or missing serial numbers will be suspect as counterfeit or stolen product.

Pass Laboratories will not repair or in any way indemnify any counterfeit or cloned product.

Pass Laboratories does not offer products in voltages intended for international markets either to authorized Pass Labs dealers or to third parties located in the United States or Canada.

For more information please contact: Pass Laboratories Inc.

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For your protection please read the following:

Water and moisture: Electrical devices should not be used near water (as per example, near a bathtub, washbasin, kitchen sink, laundry tub, wet basement or swimming pool). Care should be taken such that objects do not have the opportunity to fall, and that liquid is never spilled onto or into the device enclosure through openings.

Power Sources: An electrical device must be connected to a mains power source in strict accordance with the supplied product owner's manual. Please verify that the AC mains voltage specified in the product manual matches those requirements indicated on the unit and the AC voltage provided to your location by the power company.

Grounding: Adequate precautions should be taken so that the grounding provisions built into an electrical product are never defeated.

Power Cords: Pass Laboratories provides a power supply cord that meets all legislated requirements for the market in which the product was originally sold. If you choose to substitute an after-market product we urge you to choose one that is fully safety rated by the necessary local authority.

Power Cord Protection: Power supply cords should be routed so that they are not likely to be walked on, abraded, or pinched by items placed on or against them, paying particular attention to cords where they enter plugs or exit from a device. Never under any circumstance insert a cut or damaged power cord into a mains power socket.

Power and Signal: Cables should never be connected / disconnected with equipment powered up. Failure to heed this warning may damage or destroy equipment.

Ventilation: Power-amplifiers run hot, but you should be able to place your hands on them without discomfort. You must allow for this heat in installation, by providing for free air circulation around the product. Electronics should not be subjected to sources of excessive radiant heat. Excessive heat can shorten the life of the product and may cause the electronics to self-protect and shut down.

Servicing: To reduce the risk of fire, electrical shock or other injuries, the user should not attempt to service the device beyond that which is described in the operating instructions. All other servicing must be referred to qualified service personnel.


Right
Output
Left
Signal Ground
Input 2
Input 1
L
R
Pass Laboratories, Auburn, CA 95602
No user serviceable parts inside.
Pass Laboratories, Auburn, CA 95602
No user serviceable parts inside.