

Perreaux SXH2 Headphone Amplifier



Little Known Perreaux Fact

The Michaux-Perreaux Steam Velociped, created in France in 1868, was considered by many to be the first motorcycle. It had a small commercial steam engine is mounted at 45 degrees on the main frame member; behind which was the boiler, along with fuel and water tanks. Such steam-powered two-wheelers continued until late in the century. Other early motorcycles, such as the De Dion-Bouton, the Orient, and the Thomas, attached petroleum-powered engines to bicycles. Gottlieb Daimler, the German engineer who's known as 'Father of the Motorcycle,' was actually using his 1885 wooden 'boneshaker' (a term often used to describe early bicycles, which had wooden frames and wheels and no suspension) to test a gasoline engine he intended to use in a four-wheeled carriage.

Most headphone amplifiers are made by headphone manufacturers themselves, who understandably optimise their performance to suit their own headphones, which is fine if you want to stick with the one brand of headphones, but not so great if you want to upgrade at any point in the future, because you may find yourself locked into buying a particular brand. One also has to consider that a headphone manufacturer might not be quite so good at making amplifiers as it is at making headphones!

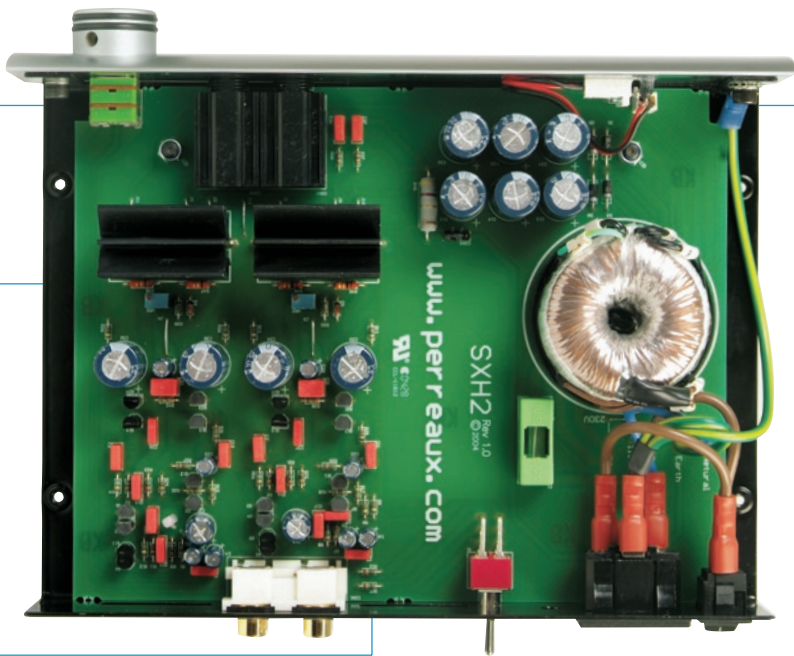
Because it's made by a specialist amplifier manufacturer, Perreaux's Silhouette SXH2 headphone amplifier has been specifically designed to drive *any* pair of dynamic headphones, from *any* manufacturer, irrespective of their impedance, sensitivity or power requirement. So if ever in the future you decide to switch headphones, (or you use different headphones for different types of music) you can always be assured of perfect performance.

Some readers may be wondering why they shouldn't just use the headphone

socket on their CD player, amplifier or receiver. The sad but true fact is that in almost all cases, the headphone amplifier inside amplifiers, receivers and CD players is generally a low cost, multi-purpose integrated circuit prone to both distortion and overload and usually quite noisy as well, so it adds background hiss. Even worse, such ICs usually share their power supply with the front panel display and DSP circuits. Hardly a recipe for high performance!

In the case of portable CD players, MP3 players, iPods and so on, you not only have to put up with an even-worse integrated circuit, but the fact that the headphone circuitry will rarely handle low-impedance headphones well and will not be able to drive any headphones to high volume levels without distortion because of limitations in the power supply voltage to the portable itself. (And no, using a mains power adaptor or a 'dock' when listening won't help!)

The Perreaux SXH2 addresses all these issues. It can be used by those after



Perreaux

Brand: Perreaux
 Model: Silhouette SXH2
 Category: Headphone Amplifier
 Warranty: Three Years
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the ultimate performance from their headphones; by those who simply don't want to lock themselves into buying a particular type or brand of headphone; and by those who just want to get superior headphone performance from their portable CD player, MP3 player or iPod.

With regard to this last, it means you could have an SXH2 on your bedside table, or on your office desk. In the case of an office desk, you could connect the SXH2 to the headphone output of your PC, giving access to music stored on it, as well as to web radio, podcasts and so on.

The Equipment

The SXH2 looks every bit the model of a perfect high-end headphone amplifier. It's built to the same exacting high standards as all Perreaux equipment, which is all the more impressive because of its considerably smaller dimensions, it being just 216mm wide, 181mm deep and 58mm high (about the size of an airport paperback novel). The front panel is a beautifully curved piece of polished aluminium whose profile, when viewed from the side, is not unlike that of an aeroplane wing.

Rather than print its name on the front panel, Perreaux has elected to etch it deeply into the front panel. To my mind, this is an excellent move, because I can see many buyers actually carrying the SXH2 between their home and office and, given its size, this means it'll probably spend at least some time rattling around the bottom of a briefcase. This type of treatment would quickly damage a painted logo.

As you can see, there's not one, but TWO headphone outputs on the front panel, implemented via standard 6.5mm headphone sockets. (So, if an SXH2 does end up on your bedside table, there'll be no excuse for not sharing the music!) Alongside this is a single aluminium volume control. Actually, when I say 'aluminium', that's not entirely true, because there are two small rubber 'O-rings' inset into grooves around the knob's circumference, to make it easier to grip and give a much more tactile 'feel' than straight metal.

The last remaining feature on the front panel is the tiny 'power' telltale that shines blue whenever the SXH2 is on. And when I say 'tiny', I mean it: it has a diameter of just 1mm. My gripe is that it's positioned just above the Perreaux engraving, midway between the 'R' and the 'E'. This is such an unusual location for a power light that when I first saw an SXH2 I thought the hole was a flaw in the aluminium. I would have preferred it somewhere else on the front panel—perhaps even as a 'fullstop' after the logo—but it's obviously my problem,

Headphone Impedance

The two most important electrical specifications for any headphones are their impedance and sensitivity. So-called 'low impedance' headphones have impedances of from about 32 up to about 150. Headphones in this impedance range may be directly plugged into the headphone jacks on hi-fi amplifiers and receivers, as well as mains-powered CD players and so on. Higher impedance headphones are normally up around 600. These types are usually intended for use in professional installations where many units may be wired in parallel, and the higher-resistance coils are less susceptible to being damaged than low-impedance coils (though of course neither of these design intentions rules out their use in home hi-fi applications). The primary disadvantage is that they won't sound very loud when used with battery-powered equipment. The

reason for this is because in order to produce 100mW in a 600 load you'd need the signal voltage to be around 7 volts, or more than four times the voltage that would be available from most battery-powered components. Headphone sensitivity is usually stated as the sound pressure level produced by one milliwatt (mW) of audio input. Typical sensitivity ratings range from around 85dB/mW to 110dB/mW. You can see that very little power is needed to drive headphones to very high listening levels. The reason for stating headphone sensitivity in milliwatts is that using voltages can be a bit misleading. For example, a voltage of 0.775V will produce only 1mW in 600 headphones, but 8mW in 75 headphones! So it is clear that you shouldn't try to mix high-impedance and low-impedance headphones in the same application (such as connecting both to Perreaux's SXH2!).



because when I made that suggestion to Perreaux they didn't agree and suggested (in the kindest possible way) that perhaps my aesthetic sensibilities were not quite aligned with the 'cutting edge' of modern design.

The rear panel is made from high-gloss black Perspex. It contains a pair of gold-plated RCA input terminals, a pair of gold-plated RCA output terminals, a small two-position toggle switch to adjust gain (High Gain/Low Gain), a tiny 240V power switch and a standard three-pin IEC 240V socket. I was exceptionally pleased to find that unlike many high-end manufacturers that have moved their production to China, the Perreaux SXH2 is entirely built in New Zealand.

In Use

Although I thought the idea of having two headphone sockets was great when I first unpacked the SXH2, as I've described, my first attempt to use both sockets was something of a disappointment. I'd set up the SXH2 on my bedside table with a pair of headphones and offered a second set to my better half. She then complained that the volume through her pair was too loud. When I turned it down sufficiently to suit her, the volume of my pair was too low for my tastes. So it appears that unless you're 'simpatico' with your co-listener, setting a volume level that will suit both listeners might involve a compromise unless one of the pairs of headphones has a volume control. I wondered if it might have been a better idea to provide two volume controls (there's plenty of room on the front panel), but in practice headphone listening is so often a solitary pursuit that I suspect the extra circuitry would neither be necessary nor cost-effective.

I have purchased more than my fair share of headphones over the years, most of which I still own, including a pair of AKGs that I mix with when doing live recordings, a pair of Sennheisers I use when I'm outside on the deck, a pair of Sony NR headphones I use when flying,

a pair of Etymotic Research ER-6s I use for jogging and a pair of Koss headphones that I'm sentimentally attached to because Koss happily replaced my original pair under its 'no questions asked' warranty when it was pretty obvious to all and sundry that some type of animal (specifically, a small Shih Tzu) had chewed the original pair into tiny pieces! (And no, I didn't get special treatment: neither the purchase order nor the warranty were in my name.)

So it was that in pretty short order I was able to prove to my satisfaction that the Perreaux SXH2 worked brilliantly with all these different types of headphones, driving them all to high volume levels with absolutely no audible distortion and no noise. But what was perhaps most noticeable was that at the levels I normally listen to headphones (um, probably too loud!), the sound quality had a much more 'live' and 'realistic' flavour, and this was true even when I was monitoring live music through the mixer, where I had the opportunity to make an A-B comparison between 'live' (no headphones) and 'live' (through headphones). That music could seem more 'live' through headphones than a live performance is easily explained by the fact that the feed from the mixer was the balanced, two-channel down-mix from a close-miked session with an a cappella group. From the desk itself, the balance between the singers was wrong and the room's acoustic rather muddy.


I also tried what seemed to me to be a far more appropriate test, where I connected the SXH2 to the line output sockets on my CD player (which has its own headphone socket), then set the volume levels so they were the same from both the front-panel socket and the SXH2. The sound from the Perreaux was noticeably cleaner and more transparent. That said, if your headphones' sensitivity is such that you can get satisfactory operation with the rear-panel gain switch in either position, I'd suggest you set the

gain high, so you can have the volume control to the left of the 12 o'clock position, because I found I preferred the sound this way.

As for a comparison when listening to MP3 (from a battery-powered MP3 player I use when jogging) and a battery-powered CD player I use when flying, the difference in sound quality was, literally, chalk and cheese, the Perreaux SXH2 walked all over them. My only regret was that since the SXH2 isn't battery-powered, I couldn't take it on my early-morning jogs (I wonder if 747s have 240V power?).

I am very conscious that many audiophiles say they prefer to listen to loudspeakers rather than headphones, so I'd ask them to consider whether they have actually auditioned really good-quality headphones and if they have, whether those headphones were being driven by a decent headphone amplifier. If the answer to either of these proposals is 'No', my opinion is that you really haven't given headphone listening a decent chance, and you should give it another go. Headphone sound can be absolutely, deliciously, deliriously glorious! (Yes, I'm a fan!)

Conclusion

At a time when buying 'the best' hi-fi components has simply become too expensive for most of us, it's a real pleasure to be able to say that if you buy the Perreaux SXH2 headphone amplifier, you *will* be buying 'the best' headphone amp around... and it isn't even going to cost you an arm and a leg! 

greg borrowman

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Perreaux SXH2 Headphone Amplifier should continue on and read the LABORATORY REPORT published on the following pages. All readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Test Results

Australian HI-FI Test Laboratories was somewhat surprised to discover when testing the output of the Perreaux SXH2 that its output into low impedances (8 Ω) is so high you could actually connect a pair of efficient loudspeakers and get a result! Look at the tabulated results and you'll see it will deliver just on 3.7 watts into 8 Ω. You wouldn't do this, of course, but it's indicative of the quality (and degree of overkill!) of the power supply and amplifier circuitry inside.

Into a more appropriate 32 Ω load the SXH2 delivered 2.7 watts per channel and into 64 Ω it delivered 1.6 watts per channel. Into 300 Ω it delivered 386mW per channel. All these figures exceed Perreaux's specifications, which are for 2.0 watts, 1 watt and 215mW respectively.

The frequency response is exceedingly flat, particularly within the 20Hz–20kHz audio band, as you can see from the accompanying graph. The tabulated figures show responses of 8Hz to 30kHz ±0.01dB and 5Hz to 60kHz ±0.1dB. Channel separation was equally good, measuring 66dB at 20Hz, increasing to 67dB at 1kHz, and then diminishing again to 65dB at 20kHz. Channel balance was not quite so good as I expected it might be, at 0.1dB, and I suspect the culprit here was the 6.5mm phono plug itself, which is not the world's greatest audio connector, but we're stuck with it. Notwithstanding, interchannel phase error was a low 0.05°.

The spectrogram showing the Perreaux's output spectrum when driven


Perreaux SXH2 Headphone Amplifier		
Test	Measured Result	Units/Comment
Frequency Response (1)	8Hz–30kHz	+/-0.01dB
Frequency Response (2)	5Hz–60kHz	+/-0.1dB
Channel Separation	66dB/67dB/65dB	(20Hz/1kHz/20kHz)
Channel Balance	0.1dB	@ 1kHz
Interchannel Phase	0.05	deg (1k)
THD+N	0.003%	rated o/p
S/N Ratio (unweighted/weighted)	98dB/105dB	dB
Maximum Gain	14.2dB	64 Ω
High/Low Gain	15-30dB	See Copy
Output	3.7 watts /2.7 watts	8 Ω /32 Ω
	1.6 watts/ 386mW	64 Ω /300 Ω
Power Consumption	NA/3.7 watts	Standby/On
Power Consumption	5.6 watts	Rated op
Mains Voltage Variation	239–252 volts	Min–Max

by a 1kHz signal is very clean, with no harmonically-related distortion components visible above the noise floor, which hovers at around -110dB for the most part. There are some power supply noise components below 2kHz, but most of these are better than 100dB down (0.0001%) as well. The actual THD figure is 0.003%.

Signal-to-noise ratio was measured at 98dB unweighted, increasing to 105dB weighted.

Australian HI-FI Test Laboratories measured the maximum gain of the SXH2 at 14.2dB, with a 64 Ω load. The action of the rear panel gain switch appeared to vary depending on the physical position

of the volume control. At low settings (towards the anticlockwise position) of the volume control, the gain switch altered output by 10dB, but the gain level increased the further the volume control was moved clockwise, to 15dB between about 10 o'clock and 3 o'clock and to 30dB when it was fully clockwise.

Mains power consumption was very low, as you can see. In general, the SXH2 will consume around 4.1 watts when operating: I don't think you'd ever reach the 5.6 watt maximum that was measured, even though this itself is very low consumption! 

Steve Holding

