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INSIDER VIEWS ON EVERYTHING VINYL

## ANALOG CORNER BY MICHAEL FREMER

**THIS ISSUE:** A smart, Swiss \$31,000 phono preamplifier is taken for a test drive.

### Inside CH Precision's P1 phono preamplifier

**A**lthough Swiss-based CH Precision is a relatively young company, its core design team has been involved in high-performance audio for many years. Their website doesn't state the company's age, but something there did provide a hint: Among the design team's previous activities was work for another Swiss company, Anagram Technologies.

In 2001, in a review of Camelot Technology's Round Table DVD player, which included an Anagram Technologies DAC, I wrote: "I was so impressed with the sound that I took the Round Table downstairs to my 2-channel audio room and used it there when I wasn't watching movies."<sup>1</sup>

I hadn't made the connection between Anagram and CH Precision when Raphael Pasche, the latter's electronics design engineer, visited last fall to install CH Precision's P1 dual-mono phono stage and the optional X1, a discretely regulated, outboard linear power supply that's claimed to exhibit ultralow levels of noise. The P1 can be ordered as a stereo preamp for \$31,000; add \$17,000 for the identically sized X1 power supply. Or one mono P1 can be used for each channel, for \$55,000 plus \$34,000 for two X1s. Expensive stuff.

#### Description

Inside and out, CH Precision gear is built to the highest standards. The P1 is made of aluminum alloy, with no screws

visible on any of its surfaces. The bottom plate sits on four stainless-steel feet, each fitted with an elastomer ring to protect delicate surfaces. Also supplied are long-shafted hardened steel spikes that fit concentric with those feet; the spikes can be used to fine-tune leveling, by inserting a screwdriver (supplied) in the slotted tops of those shafts, which extend all the way up to the top plate. The P1 and X1 are both 17.3" square; the P1 is 5.25" high and weighs 44 lbs, the X1 5.25" high and 55 lbs. CH Precision components can be securely



**Backgrounds were dead "black," even with the volume well advanced.**

stacked and isolated from each other using a built-in vibration-suppression system that employs those spikes and also features hi-tech discs of carbon-polymer composite. If you don't use this

<sup>1</sup> See *Stereophile Guide to Home Theater*, May 2001, Vol.7 No.4: [www.soundandvision.com/content/camelot-technology-round-table-dvd-player](http://www.soundandvision.com/content/camelot-technology-round-table-dvd-player).

system, you can hide it by screwing machined discs into the openings atop the enclosure.

The P1's appearance is elegant and free of knobs—it's operated via five tiny pushbuttons—from the top, Standby/Mute/Unmute, followed by four menu-navigation controls: Up, Okay, Down, and Cancel.

Metal-film resistors are used throughout the P1's signal path, and custom film capacitors in the filtering section. The P1 offers both RIAA and enhanced Neumann pole<sup>2</sup> equalization. A pair of optional boards (\$1850) include the EQ curves of EMI, Columbia, Decca (*ffrr*), and Teldec. I passed on this option, but that's not meant as an editorial comment!

On the P1's rear panel are three unbalanced (RCA) and three balanced (XLR) inputs, and outputs of both types as well as BNC. Each input has its own discrete class-A gain stage and independent power supply—this costs a lot more to implement than putting an input-selection stage *before* the first amplification stage, but the latter degrades the signal quality.

After the first gain stage comes the input-selector circuit, immediately followed by the passive RIAA EQ. Then comes the second gain stage, which includes the high-pass filter. The signal is buffered after equalization, and provides the necessary gain because the RIAA circuit drops the signal level. While there are unbalanced and balanced inputs, the first stages of both the voltage and current inputs are unbalanced. The rest of the circuitry is balanced. Two inputs are current-amplification circuits dedicated to moving-coil cartridges.

According to Raphael Pasche, the current input's first gain stage is a very-low-impedance (<100 milliohm, which is a "virtual ground input"), trans-impedance amplifier that converts the current delivered by the MC cartridge into a voltage, thus producing gain. MC cartridges produce weak voltages but strong currents; the lower the cartridge's internal impedance, the greater the current output. Since the gain is related to the cartridge's internal impedance, which varies with the cartridge, the P1's current inputs offer six levels of gain.

Current-amplification circuits produce the best signal/noise ratios, and don't require cartridge loading to achieve flat response. The current input noise (CH calls it the equivalent

input noise, or EIN) is specified as <-135dBu without the X1 power supply, or <-138dBu with the X1, with 1 ohms termination, gain +70dB, 22kHz bandwidth.

The third input, which can be configured for either moving-magnet or moving-coil cartridges, is a more traditional voltage amplifier featuring an ultra-low-noise FET input stage. The P1's voltage input also offers six levels of gain: 35, 40, 55, 60, 65, or 70dB. The EIN specs for the voltage gain input are also impressive: <-130dBu without X1, <-135dBu with X1 and 1 ohms termination, gain +70dB, 22kHz bandwidth. Of course, when the third

## Current-amplification circuits produce the best signal/noise ratios.

input is configured for an MM, you can use your choice of step-up transformer with your MC cartridge, giving you a third option.<sup>3</sup>

P1 owners who use the voltage-amplification input needn't worry about calculating loading: The P1 comes with a 45rpm test record. Play it and the P1 does the work for you, using your cartridge to calculate its results. Side 1 contains a track of 250Hz–30kHz filtered pink noise designed to be used in conjunction with a "wizard" available from the P1's menu. The wizard analyzes the frequency response of the entire system—cartridge plus tonearm plus P1 input loading—while varying the resistive loading of the P1's voltage input.

You can test the P1's entire loading range of 20 ohms to 100k ohms, selectable in 500 steps (load fetishists, knock yourselves out!)—or, for finer tuning, any subset of that range. The P1 automatically acquires 21 different frequency-response curves, offering input loadings evenly spread across the range selected in the previous step.

In addition to the FR curve for each loading value, the wizard provides an average level and the standard deviation of the flatness of each curve. Once the P1 has completed its calculations, at the push of a button, the front panel displays the FR curve of whatever loading you choose. You scroll through them, looking for the flattest response (assuming that's your goal), then push

the button to set that load value, which is then displayed on the P1's screen.

One of the problems with resistive loading is that because the signal passes through the resistor, in addition to flattening the response curve, the signal's level is decreased. The P1's manual suggests that you make sure that the average drop in level doesn't exceed 2–3dB relative to the 100k ohm load selection. It also suggests that you examine the curves for the most extended FR and, of course, curve flatness.

The wizard is particularly useful if you use an outboard step-up transformer, which is when the loading math can get tricky. A selectable subsonic high-pass filter is available for each input—though if you can afford a P1, your turntable probably won't need it.

More of CH Precision's specs for the P1: output levels of up to 8V RMS balanced and 4V RMS unbalanced; a frequency response of >400kHz (current input selected, RIAA EQ filter disconnected); and total harmonic distortion plus noise of <0.01%, 1kHz, output level 3V RMS, 22kHz bandwidth.

While the power supply is critical to any piece of analog gear, it's especially so for a phono preamp, which must produce a great deal of gain: Providing the amplifier stages with clean DC is critical to producing a low noise floor. The power supplies in all CH Precision products are discrete, the crucial stages using a special shunt circuit. The P1 doubles the input-stage regulation, with a second stage placed in series with the first to improve voltage consistency. The linear power supply features multiple independent local regulation circuits, along with an oversized toroidal mains transformer that supplies both phono stage boards and also powers the digital section (front panel display, microcontroller, and DSP-based system monitor). Discrete, low-noise regulators are used throughout the X1 that each audio section receives the purest DC—that is, power with the lowest possible amount of noise.

2 See <http://www.stereophile.com/content/cut-and-thrust-riaa-lp-equalization-neumann-4th-pole-sic>.

3 Raphael Pasche provided me with an excellent explanation of why a voltage-amplification circuit requires loading a cartridge with specific impedance. But to save space here, I refer you to Hagerman Technology's explanation, also excellent, at [www.hagtech.com/loading.html](http://www.hagtech.com/loading.html), where you'll also find calculators for MM capacitance and MC loading.

## Setup and Use

The P1's rear panel is well organized and easily accessible, even by the braille method I have to use because I don't have an easy way to reach the rear panel of any component placed on my HRS racks, which are set close to the wall behind them.

Ground hum and noise are facts of

port on the P1's rear panel.

## Sound

If you've got an ultra-low-output MC cartridge or three, the advantages of a current-amplifier phono preamp will become as immediately apparent to you as they did to me when I reviewed the B.M.C. Phono MCCI in the June

current input, the P1 was the quietest phono preamp I've heard. Backgrounds were dead "black," even with the volume well advanced and my ear almost touching the tweeter: I heard only a hint of hiss and zero hum.

More important, music had an honesty, clarity, transparency, and rhythmic drive that, in the right systems and for the right ears, will be "the end." But it won't be for everyone, and satisfaction using such a no-compromise, honest electronic circuit will certainly depend on the records played.

Before I played, for the first time, a new monophonic reissue of Bob Dylan's *John Wesley Harding* (2 45rpm mono LPs, Columbia/Legacy/Mobile Fidelity Sound Lab MFSL 2-464), I said to myself, "I have an original Columbia mono, a Sundazed mono, and the Columbia/Legacy mono. What the hell am I going to learn from *this* reissue?"

A lot. All of the versions I have sounded better through the P1, but especially the new MoFi. If you love this album, it's worth the asking price of \$49.99. I don't know how MoFi did it, but the clarity of the strummed acoustic guitar and its ability to consistently cut through and be heard above the more powerful bass and drums amazed me, especially through the P1.

The P1 tightly controlled the somewhat loose and deliberately overripe bass on all issues of this album while fully expressing it and, at the same time, clarifying the guitar-strum transients. It all resulted in the feeling that I was hearing this album for the first time. Again.

4 See [www.stereophile.com/content/bmc-phono-mcci-phono-preamplifier](http://www.stereophile.com/content/bmc-phono-mcci-phono-preamplifier).

5 See my November 2014 review of the MR Labs VERA 20 at [www.analogplanet.com/content/current-affair-intriguing-mr-labs-vera-20-mc-phono-preamplifier](http://www.analogplanet.com/content/current-affair-intriguing-mr-labs-vera-20-mc-phono-preamplifier). The owner-founder of MR Labs has since passed away; his successor is working to get the company back on a firm footing.



**Above:** A glimpse of the P1's rear panel, including the beloved ground sockets. **Below:** The X1's workmanlike rear panel.

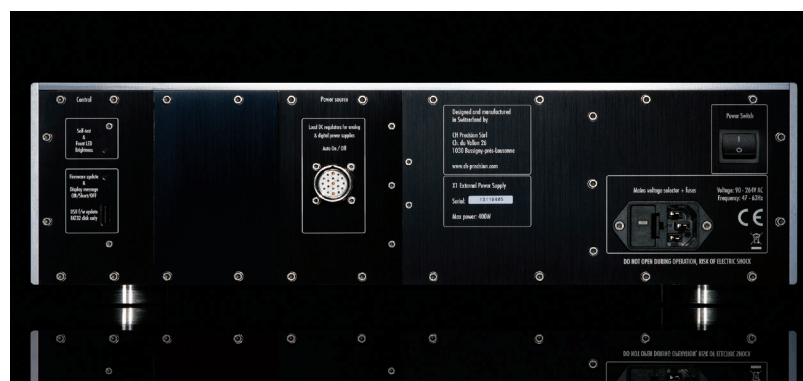
**The P1 has the absolute best ground-lug system I've ever encountered.**

the analog life, yet ground-wire spades come with variously sized gaps, from tiny to gaping. So do the ground lugs on phono preamps. Mismatches are common, and that's frustrating, especially if you have to reach around the thing to make a connection. The P1 has the absolute best ground-lug system I've ever encountered. Were I the King of Analog, I'd decree that *Every manufacturer must copy it*. CH Precision provides a pair of mini-banana plugs to which are affixed mini-wing nuts. You can securely connect the ground-wire spades to the wing nuts, then easily push the mini-bananas securely into the two signal-ground receptacles on the rear panel. It's such a pleasure. So many grounding systems are such pains—as on products with three or four inputs and just a single, fat ground lug. This may be subsidiary stuff, but it's *important* subsidiary stuff.

CH Precision's Android-based remote-control app works if you can provide an Ethernet Internet connection, which I could. I'm an Apple guy, so CH lent me a Samsung tablet, which for me was harder to learn than using the tiny buttons on the front panel and the display's nested menus. P1 firmware updates can be installed via a flash drive plugged into the USB

2013 issue.<sup>4</sup> The ultra-low noise floor, freedom from voltage-suppressing loading, and overall tonal neutrality allow the cartridge to fully express itself, for better or worse. I heard that with the B.M.C., and with MR Labs' VERA 20.<sup>5</sup> Inherent in current-amplifier phono preamplifiers are an openness, a tonal neutrality, and a background *quiet* that you should hear, though the result will not be to everyone's taste—especially those who prefer a warmer, richer sound. However, it's easy to argue that the place to inject those qualities into the system is at the cartridge and/or loudspeakers themselves.

In any case, via either voltage or



Even the microphone pops amazed! They came quickly, erupted fully, then evaporated as I've never heard them evaporate before. I don't want to concentrate on such imperfections, but they were evidence of the P1's speed and solid musical *grip*.

I'd never heard "The Ballad of Frankie Lee and Judas Priest" so perfectly reproduced. The MoFi made it sound better than ever through a variety of phono preamps, but best of all through the CH Precision P1. And the louder I played it, the better it sounded.

Compared to my reference phono stage, the Ypsilon VPS-100 Silver Edition—or even to the much-loved and recently departed Dan D'Agostino Momentum—the CH Precision's overall sound was on the analytical side. But with the right recordings, wow! And the P1 was a rhythm'n'pace champ.

Some products have me up all night, pulling out record after record; some don't. The P1 did, and gave me an exciting and fully pleasurable sonic ride every time.

I don't see how anyone could sit down and listen through all eight sides of *The Randy Newman Songbook* (4 LPs, Nonesuch 550735-1) and not think "There's Randy at the microphone and there's his piano," both

presented three-dimensionally, with studio acoustics, harmonics, textures, and especially dynamics, all intact. Yes, I know—it was recorded digitally, mastered by Bob Ludwig from files cut at 24-bit/96kHz.

Unfortunately for me, the P1 inspired me to also try cartridge after cartridge. That takes a lot of time. I began with the Lyra Etna SL, but then just *had* to try cartridges of even lower output—Ortofon's Anna and A95—and then some with ultra-low internal impedance, such as the Kubotek Haniwa HCTR01. In the last few months I've tried them all, but don't have space to go into detail here (maybe a short Follow-Up next month?).

When I then played the same tracks through my reference phono stage, I liked the Ypsilon VPS-100's somewhat rounder, more three-dimensional images, more-fleshed-out harmonics, and sense of musical flow—but I sure missed the P1's tauter, faster, cleaner bass lines and overall grip. With some LPs, the Ypsilon was more pleasing; with others, my nod went to the P1. I need both! If I ran a Gear Motel—you know, one of those places where audio components check in . . . but they don't check out—I probably *could* have both. But I own and love the Ypsilon, and I can't afford the P1 even at an accommodation price. So back to CH

Precision it will go. And I will miss it.

A good compromise between the ruthlessly revealing, utterly transparent, and honest but technocratic CH Precision P1 and the more harmonically rich but equally transparent, full-figured but not fat-bottomed, somewhat more forgiving Ypsilon VPS-100 would be the Dan D'Agostino Momentum. I could live with and love any of the three. But if you love the sound of, say, your Koetsu through Audio Research's Phono Reference 3, I'd say that only the Ypsilon might please you—with the emphasis on *might*. But however you slice it, these are the best of analog times.

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