Esoteric Audio Research EAR912 PREAMPLIFIER

Art Dudley

cutline

DESCRIPTION Tubed stereo preamplifier. Tube complement: five 7DJ8/PCC88. Phono inputs: 2. Line inputs: 2 balanced, 3 unbalanced. Tape loops: 1. Outputs: 1 balanced, 1 unbalanced. Input impedances, phono: 47k ohms, moving-magnet; 3, 6, 12, or 40 ohms, moving-coil. Output impedance: 600 ohms. Line-stage gain: 14dB. Phono-stage gain: 50–80dB. Signal/noise ratio: 68dB phono (ref. 2.4mV), 90dB line (ref. 1V). Frequency response: 20Hz–20kHz, –0.3dB. Distortion: <0.1% at 1kHz, 3V output. Phase-inverting: No. No, no, no.
DIMENSIONS 19" (485mm) W by 5.25" (135mm) H by 10.5" (270mm) D. Weight: 29 lbs (13.2kg).
SERIAL NUMBER OF UNIT REVIEWED 014804.
PRICE $9995. Approximate number of dealers: 24.
MANUFACTURER Esoteric Audio Research/Yoshino Ltd., Coombe Grove Farm, Ermine Street, Arrington, Cambridgeshire SG8 0AL, England, UK. Tel: (44) 1223-208-877. Web: www.ear-yoshino.com. US distributor: EAR USA, Inc., 1087 East Ridgewood Street, Long Beach, CA 90807. Tel: (562) 422-4747. Web: www.ear-usa.com.

My opinions keep changing—more evidence of life before death, I suppose—including my thoughts on audio-system hierarchies. I used to think that preamps were among the most sonically influential components, certainly more so than power amplifiers. I'm not so sure anymore.[1]

That doesn't leave much to write about whenever a new preamplifier *does* come my way, so I'm filling the void with my expanding concern for creature comforts: More than anything else, the preamplifier is the ergonomic focus of any decent music system, so I'm here to praise it for that. Now I've got something to care about again.

Viewed in that light, Esoteric Audio Research's brand-new EAR912 control preamp (EAR's UK website calls it a Professional Tube Control Centre) seems to have been lifted from my dreams. A true full-function tube preamplifier—it combines line-level gain with phono gain and equalization—it's equipped with two pairs of equally configurable phono inputs, internal moving-coil step-up transformers, a mono switch, six pairs of line-level inputs (two of them balanced), two pairs of out-

1 Why is it that most of us can name at least a dozen vintage power amps we wouldn't mind owning—Quad II, Western Electric 93, Dynaco Stereo 70, Marantz 9, *et al*—but probably fewer than two or three vintage preamps?

puts (one balanced), and, best of all, a pair of VU meters. If you're wondering why I've never mentioned a need for VU meters, it's because I wasn't aware of it until now. I'll get back to those in a minute. First, let's have a look at the EAR912's basic architecture.

Design

EAR's Tim De Paravicini has designed his newest preamp around the 7DJ8 dual-triode tube (called the PCC88 in Europe). The EAR912 uses three of them in the phono stage—where one tube splits its chores between the two channels—and another two for the line stage. As the renowned Mr. De P told me recently, the 7DJ8 is a tube he knows well, having designed a fair amount of his pro gear around it, and he points in particular to its exceptionally long life. (The arguably more common 6DJ8 can be substituted, if desired, notwithstanding a slightly different filament voltage requirement—although in such a case it's best to replace *all* the tubes in a given stage at once.)

THE '912 **ISN'T THE FIRST** EAR PREAMP TO USE INTERNAL STEP-UP TRANSFORMERS FOR MOVING-COIL **CARTRIDGE GAIN**.

MEASUREMENTS

The EAR 912's phono stage offered gains of 50dB, 44dB, and 38dB in MM mode, depending on the position of the front-panel gain switch. The corresponding figures for MC operation were 19dB higher. The MM input impedance was 43k ohms at 20Hz, this increasing slightly to 50k ohms at 1kHz and 47k ohms at 20kHz. With the phono input set to MC and 40 ohms, I measured an input impedance of 422 ohms at 1kHz, this decreasing to 117 ohms at 20Hz and 378 ohms at 20kHz. The phono input preserved absolute polarity.

Fig.1 shows the 912's phono-stage frequency response, assessed at the main outputs. The RIAA correction appears to incorporate the IEC-recommended LF rolloff, but also features a slightly rising response above 5kHz. In this respect, it is less accurate than EAR's solid-state 324 phono preamplifier that AD reviewed in July 2004. Even when set to the highest gain, the 912's phono-stage signal/noise ratios were excellent. In MM mode, the A-weighted ratio was 81dB (ref. 1kHz at 5mV), this decreasing to a still good 67.7dB, wideband, unweighted. Due to the 912's use of a transformer to provide the additional gain required, the MC mode's S/N ratios were not appreciably different, at 79.7dB and 66.7dB, respectively (both figures referred to 1kHz at 500µV). This is a superbly quiet preamp.

A downside of the very high gains available from the 912's phono stage is a reduced overload margin. The margins were acceptable at the lowest gain setting, ranging from 10dB at 20Hz and 20kHz to 21dB at 1kHz (all figures ref. 1kHz at 5mV). Each 6dB increase in gain, however, reduced the margin by the same 6dB. Owners of the 912 should set the phono-stage gain to the lowest level acceptable with their preferred cartridge. But with its gain set appropriately, the 912 offers quite low levels of both harmonic distortion (fig.2) and intermodulation distortion (fig.3).

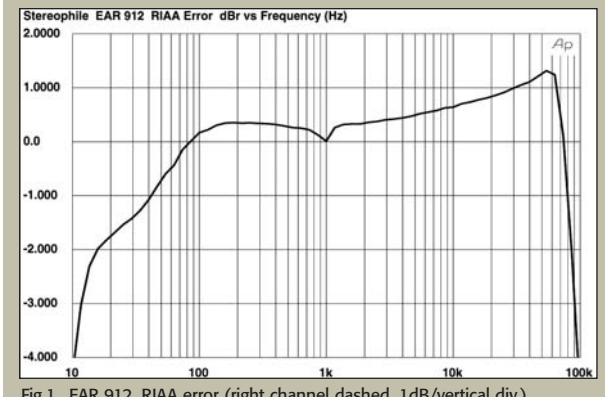

Fig.1 EAR 912, RIAA error (right channel dashed, 1dB/vertical div.).

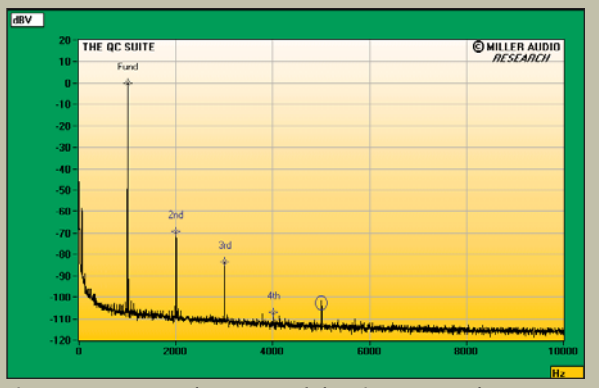

Fig.2 EAR 912, MM mode, spectrum of 1kHz sinewave, DC–1kHz, at 1V into 8k ohms (linear frequency scale).

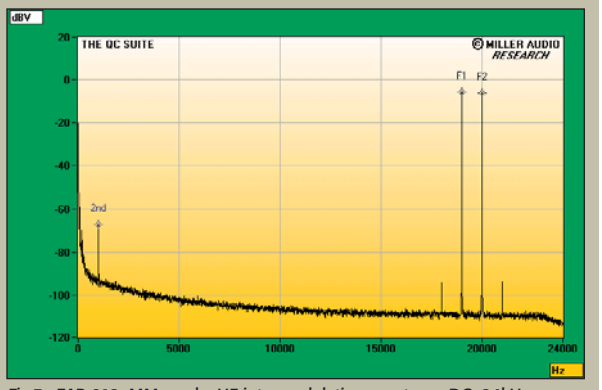

Fig.3 EAR 912, MM mode, HF intermodulation spectrum, DC–24kHz, 19+20kHz at 1V into 8k ohms (linear frequency scale).

The '912 isn't the first EAR preamp to use internal step-up transformers for moving-coil cartridge gain, but it *is* the first in which those trannies are addressed by two different pairs of phono inputs. There's a selector knob on the front panel for choosing which input pair is active, as well as another for selecting the desired transformer primary—3, 6, 12, and 40 ohms are the nominal impedances, corresponding with respective additional gains of 30, 26, 23, and 20dB—or for bypassing the step-up transformer altogether, as with a moving-magnet cartridge. The EAR912's phono section remains iron-rich even so: Its RIAA equalization circuit uses a pair of custom-wound inductors, which De Paravicini selected for being less prone to overloading and ringing than capacitors, and the transition from phono stage to line stage is accomplished with a pair of similarly bespoke coupling transformers.

The transformer approach was chosen not only for electrical efficiency and purity of sound, but for flexibility in use: A three-position attenuation knob on the front panel allows the user to choose between multiple secondary windings on the interstage coupling transformers—for full gain, –6dB, or –12dB. That control, used in tandem with the one for selecting the appropriate step-up transformer primary windings *and* the step-up transformer bypass knob, provided the highest level of flexibility I've ever enjoyed in a phono preamp. As I write this, I have a Rega turntable with a Linn Adikt MM cartridge connected to the EAR912's Phono 1 input, and a Linn turntable with a Lyra Helikon Mono MC cartridge connected to Phono 2—and this is only one of many combinations I've happily used over the last couple of months.

That's also where the meters come in, literally and figuratively: Right before the line stage's volume control, two custom-made VU meters measure voltage on an average rather than peak basis—the idea being to approximate the loudness of the music overall and not to telegraph to the user every last transient spike. Here again, De Paravicini's years of experience designing

measurements, *continued*

The line stage offers a maximum voltage gain of 10.7dB, balanced input to balanced output. Peculiarly, the maximum gain for unbalanced operation was 2dB higher. Both inputs preserved absolute polarity; *ie*, were noninverting, and the XLR jacks appear to be wired with pin 2 hot. The balanced input impedance was 22k ohms at 20Hz and 1kHz, dropping slightly to 14.2k ohms at 20kHz, while the unbalanced input impedance was a constant 18k ohms across the audioband.

The line-stage output impedance was a suitably low 32 ohms balanced and 39 ohms unbalanced across most of the audioband, rising at 20kHz to still-low values of 65 ohms and 87 ohms, respectively. The front-panel VU meters were calibrated for an input of 775mV = 0dB (equivalent to a level of 1mW into 600 ohms), while the unity-gain setting of the Volume control was 2:00. The Volume control also showed excellent channel matching at all settings.

With the Volume control set to its maximum, the balanced frequency response into 100k ohms was flat to 30kHz, with a steep rolloff above that frequency (fig.4, top pair of traces). The increasing source impedance at high frequencies resulted in a slightly shelved-down top-octave output into the low 600-ohm load (fig.4, lower traces). The unbalanced response into 100k ohms (fig.5) was very different, with some ultrasonic peaking evident, though this should not have any subjective consequences. Channel separation was disappointing (fig.6), marred by capac-

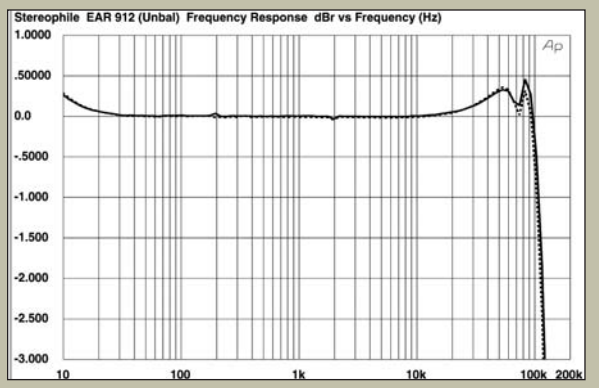

Fig.5 EAR 912, Volume control at max, unbalanced frequency response at 1V into 100k ohms (0.5dB/vertical div.).

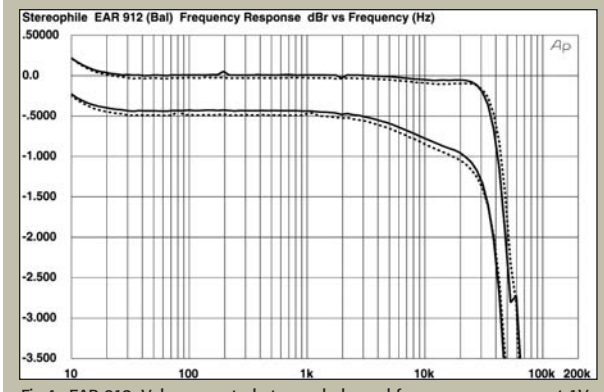

Fig.4 EAR 912, Volume control at max, balanced frequency response at 1V into (from top to bottom at 200Hz): 100k ohms, 600 ohms (0.5dB/vertical div.)

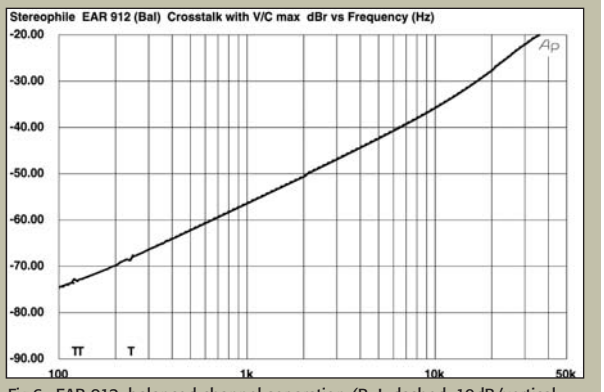

Fig.6 EAR 912, balanced channel separation (R–L dashed, 10dB/vertical div.).

studio gear paid off: "The Bell Labs specs from the 1930s called for a 'spade' pointer, and even required a certain *yellowness* of the background," he told me. "That way, you were able to see what the meters were indicating from across the room: You didn't need to know precisely what number the needle was pointing at any time." The EAR912's meters follow suit, and during my time with the EAR912 they proved enormously useful: By working with the controls described above, I was able to use the meters to help find the settings that were right for every different phono cartridge, representing a wide range of internal impedances and output voltages.

The meters also respond to line-level signals, of course, which can travel their way from a brace of single-ended and true balanced inputs, the latter having their own input transformers. Sadly, and through no fault of De Paravicini's, watching the meters during CD playback wasn't half so joyous as during phono use: They don't shrink from telling the user how badly mastered (as in: wildly, excessively hot) most contemporary recordings appear to be. Which is depressing.

THE EAR WAS ***UNUSUALLY*** NOISELESS, WITH VERY LITTLE TUBE "RUSH" AND LITERALLY **NO HUM.**

A final design touch worth noting: In addition to the ones already mentioned, and the one you'd expect to be at the heart of its power supply, the EAR912 contains two *more* custom-wound transformers: These are output transformers, used to keep the preamp's source impedance low (and, of course, to block DC, should it amble past by mistake). Each of these has two secondaries: one for feeding the single-ended (RCA jack) outputs, which are grounded, and the other for feeding the balanced (XLR jack) outputs, wherein the ground is floated. Both sets of outputs can be used simultaneously, as with a subwoofer or some other device that accepts a line output.

The EAR912 is a visually striking piece of gear. I love the looks of the thing, and the proportions. It's tall because it needs to be: The backs of the meters need to clear the circuit-board components below, among other things. But it doesn't need to be especially deep, so it isn't. The metalwork is exceptionally sturdy and well finished, with thick semigloss enamel throughout and a black anodized front panel with no unpleasant edges. For once, rack-style handles on the front are more a necessity than a mere boy-racer affectation (like spoilers): With all that iron inside, the EAR912 isn't as easy to lift as most other preamps.

But lift its 29 lbs I did, substituting the all-in-one EAR912 for my reference combination of Fi preamplifier and

measurements, *continued*

itive coupling between the channels and resulting in just 28dB of separation at 20kHz, though 56dB was available at 1kHz.

Figs.7 and 8 show how the percentage of THD and noise in the 912's output varied with output voltage for balanced and unbalanced operation, respectively. The latter is actually slightly more linear, but both modes are beyond reproach at typical output levels. A maximum output of 9.5V (at 1% THD) is available from both modes into 100k ohms, and 8V into 600 ohms, both figures way more than enough for practical use. In fact, noting where the traces in these two graphs have their inflection points, it appears that the EAR 912's gain architecture is sensibly arranged to give the lowest distortion at the levels where the partnering power amplifier is close to being clipped.

Its use of transformers does mean that the 912's line

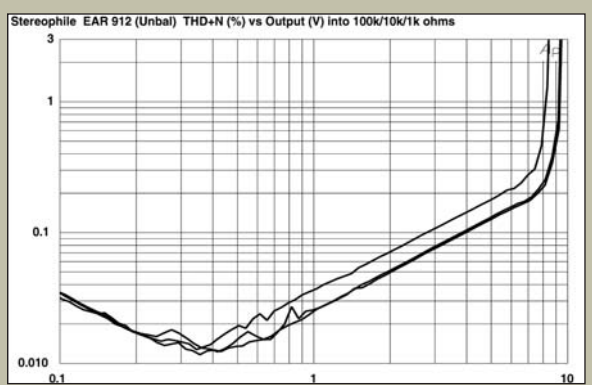

Fig.8 EAR 912, unbalanced distortion (%) *vs* 1kHz output voltage into (from bottom to top at 1V): 100k, 10k, 1k ohms.

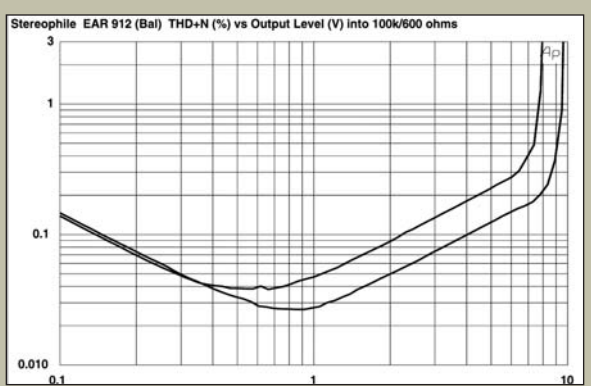

Fig.7 EAR 912, balanced distortion (%) *vs* 1kHz output voltage into (from bottom to top at 1V): 100k ohms, 600 ohms.

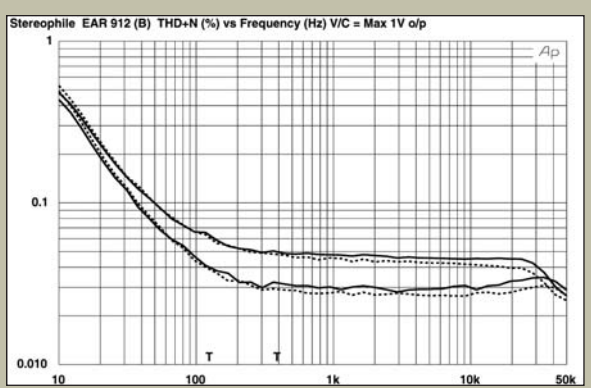

Fig.9 EAR 912, balanced THD+N (%) *vs* frequency at 1V into (from bottom to top): 100k ohms, 600 ohms.

Tamura TKS-83 moving-coil step-up transformers. The Fi is rare enough these days, inasmuch as it combines line-level gain with phono equalization and sufficient additional gain for MM pickups, and although it doesn't have transformers for interstage or line-output coupling, the Fi *does* use the comparable 6DJ8 tube throughout: an interesting comparison.

I did most of my early listening with a Linn LP12 turntable with Ekos tonearm and my Miyabi 47 phono cartridge: low output, and *very* low internal resistance. I determined that using the EAR912's 3 ohm step-up transformer primary with full (–12dB) attenuation was best for the Miyabi—and it was then that I heard at least one aspect of the EAR912's superiority to my reference gear: The EAR was *unusually* noiseless, with very little tube "rush" and literally no hum, even with the ground leads from the Linn Ekos and Rega RB300 tonearms left unconnected.

Maybe that's what made the EAR so good at retrieving very subtle details, such as the distinctive attack, sustain, and decay of the big orchestral drum in mezzo-soprano Janet Baker and conductor Sir John Barbirolli's famous recording of Elgar's song cycle *Sea Pictures* (LP, EMI ASD 655). Similarly, I noticed trills on the flute I'd never noticed before in the first movement of Brahms' Symphony 2, with Leonard Bernstein and the New York Philharmonic (LP, Columbia D3M 32097). And tape splices and microphone punch-ins on my favorite pop recordings—listen to how the "room sound" changes just before Paul starts singing on the Beatles' "Let It Be"—were laid completely bare.

For the most part, the musical and sonic performance of the EAR912 didn't depart significantly from that of other top-class preamplifiers I've had in my home—including the Lamm LL2 Deluxe (reviewed in the September 2005 issue) and the Audio Note M2 Phono (June 2004), as well as my own Fi. All four are substantially, timbrally uncolored things, though the Audio Note is probably the "darkest" of the bunch, and all of them get the basic pitch and timing information right. All four are also capable of being emotionally thrilling, though I'd give the Lamm a slight edge for seeming to strip the greatest amount of crud away from the notes and thus seeming to let the music breathe to the utmost. (But I admit that that comparison is flawed: The Lamm is a line-level preamp, and I've heard it paired only with phono sections from other makers.)

But I dare say the EAR912 is the most dramatic sounding of the lot. I never once heard it compress the signal, regardless of the record played. And it allowed music to come through with so much of its intensity and nuance intact that literally everything I played was impossible to ignore. One afternoon in particular, when I was hooking up my mono record player to use as a source with one of the

stage introduces rather more THD at very low frequencies than is usual (fig.9), though this is dominated by the subjectively benign second and third harmonics (fig.10). At higher frequencies all the harmonics drop considerably in level (fig.11), though a trace of 120Hz hum (at –84dB) could not be removed no matter how I adjusted the grounding between the 912 and my Audio Precision test set. Intermodulation distortion was also low in level (fig.12).

In general, the EAR 912's measured performance reveals the excellent audio engineering I have come to expect from Tim de Paravicini. But I was concerned by the disappointing channel separation and that (very faint) trace of hum in the output. It is fair to note that AD didn't note any hum in his system.) *—John Atkinson*

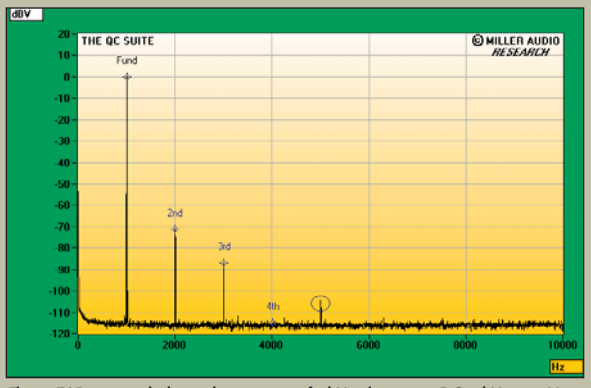

Fig.11 EAR 912, unbalanced spectrum of 1kHz sinewave, DC–1kHz, at 1V into 8k ohms (linear frequency scale).

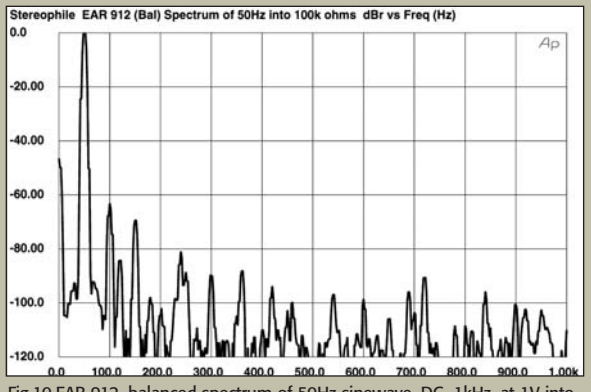

Fig.10 EAR 912, balanced spectrum of 50Hz sinewave, DC–1kHz, at 1V into 100k ohms (linear frequency scale).

Fig.12 EAR 912, unbalanced HF intermodulation spectrum, DC–24kHz, 19+20kHz at 1V into 8k ohms (linear frequency scale).

EAR912's phono input pairs, I chose the great UK release of André Gertler performing the Berg Violin Concerto with Paul Kletzki and the then-new Philharmonia Orchestra (10" LP, Columbia 33C 1030). I was actually a bit peeved at first, because I had to stop what I was doing and sit down. Of course, my annoyance quickly turned to rapture as the system brought me another step closer to understanding what Berg had had in mind.

But the truth about the EAR912 could be had by letting it play simpler music—and by hearing how it helped to pull levels of meaning, of emotional and intellectual engagement, out of what would otherwise be just electromechanical noise. Dylan's "The Lonesome Death of Hattie Carroll," from *The Times They Are A-Changin'* (mono LP, Columbia/Sundazed 5108), was appropriately moving—besides which it simply *sounded* fine, with superb vocal presence and a well-textured acoustic guitar sound. And pianist Witold Malcuzynski's sophisticated but almost offhand approach to Chopin's Waltzes (LP, Angel S 35726; CD, EMI Classics 5 68226 2) was complemented by the EAR912's good sense of flow and momentum: Its sound on these recordings was as nonmechanical as it gets.

A note on spatial performance: Like the other preamps I've mentioned here, the EAR912 tended toward a *big* sound: a wide, deep soundfield that always seemed capable of sounding even bigger when the need arose, with stereo imaging that sounded more real to me than the overly precise sound I associate with high-end audio salons. The only departure from that was when I used an MM cartridge with the EAR, bypassing the step-up transformers altogether. When I did that, the soundfield was noticeably more distant, albeit not unpleasantly so. I have no idea what could account for that, but when I tried driving the EAR912's phono stage with other, non-EAR trannies, mostly in an effort to see how the integral ones fared against the competition, the sound had consistently greater scale with the iron in line than without.

And how *did* Tim De P's trannies stack up? Quite well, I think. In direct comparisons I preferred them to my Audio Note AN-S2 (though some readers might consider the test to be flawed by the fact that the outboard unit required an extra interconnect in the chain), and while I thought the Tamura sounded still clearer and more natural (so much for the cable excuse), the difference was modest.

Summing Up

Modest differences are, as I've suggested, no strangers to the modern-preamp landscape—but the functionality and flexibility of the Esoteric Audio Research EAR912 are anything but common. This product taught me something about my records *and* the other components in my system, and I enjoyed every minute I spent with it. The EAR912 isn't cheap, but it's a Class A preamplifier in every sense, and an heirloom-quality instrument that represents the apex of both build quality and design ingenuity. I miss it already—and I strongly recommend that you try to experience it for yourself.

ASSOCIATED EQUIPMENT

ANALOG SOURCES Linn LP12 turntable, Linn Lingo power supply, Linn Ekos tonearm; Rega Planar 3 turntable, Rega RB-300 tonearm; Miyabi 47, Linn Akiva, Lyra Helikon Mono, Linn Adikt, Rega Elys cartridges; Audio Note AN-S2, Tamura TKS-83 moving-coil step-up transformers.
DIGITAL SOURCES Naim CD5x CD player, Linn Unidisk SC universal player.
PREAMPLIFIER Fi.
POWER AMPLIFIERS Lamm ML2.1, First Watt F2.
LOUDSPEAKERS Quad ESL-989, Lowther PM6As in Medallion horns.
CABLES Interconnect: Audio Note AN-Vx, Nordost Valhalla. Speaker: Audio Note AN-SPx, Nordost Valhalla. AC: JPS Labs The Digital (CD players).
ACCESSORIES Mana Reference Table, Reference Wall Shelf (turntables).
—Art Dudley

Tim De Paravicini & Heavy Iron

For the past several years, rather than let an active phono preamplifier do all the work, I've preferred to use step-up transformers with low-output moving-coil cartridges. There are some good active stages out there—the Linn Linto comes to mind, as well as the Naim Prefix and the MC phono boards for the DNM 3-C preamplifier—but it's my experience that trannies let the music *breathe* a little better.

But because I'm not an engineer, and because the old-fashionedness of the transformer approach at times leaves me feeling somewhat insecure, I'm always happy when someone who *really* knows what he's doing throws in his lot with the iron men. And so it goes with Tim De Paravicini of EAR.

De Paravicini points to a number of solidly technical reasons for letting a step-up transformer provide the first 20 or so dB of gain for a low-output cartridge. "The problem with active devices is they're noisy," he says. "A properly designed transformer does it with much less noise." He also suggests that a transformer recovers, rather than wastes, all of a cartridge's delicate output signal, and provides better electrical damping, too.

De Paravicini knows whereof he speaks, having been hired at a tender age by Luxman in Japan to design amplifiers *and* transformers. Even before then, beginning at age 13, he was teaching himself the basics of transformer design by dissecting other people's discarded electronics. "When they were wax-impregnated, it wasn't that difficult," he says. "I could melt the wax and tinker—and then buy more junk, and tinker all over again."

At Luxman, De Paravicini remembers, there was one Japanese engineer in particular who encouraged the young emigrant's interest in transformers, and from that point forward he never turned their design over to someone else: "Doing it myself gives a greater level of control over the finished product."

Is there anything in particular that stands out in the speccing of a good trannie?

"No one thing, really," De Paravicini says. "It's a collection of everything. Yes, you have to get your sizes right, and your cores. And you have to be aware that there are a great many specific methods of winding: The textbooks only speak in generalities.

"Making good transformers is quite a bit like other specialist trades, I'm afraid: It's a black art." *—Art Dudley*