

Ayre K-5xeMP line preamplifier

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The name Ayre Acoustics is always associated in my mind with preamplifiers; the Colorado company's second product was the K-1 preamplifier, which was [reviewed](#) for *Stereophile* by Wes Phillips in March 1997, and it followed the Ayre pattern in being fully balanced and using no overall loop negative feedback. Ayre's cofounder and chief engineer, [Charlie Hansen](#), hates feedback with a passion.

The K-1 cost \$5250 when it was introduced at the end of 1996, which was not inexpensive. By the time Paul Bolin reviewed the K-1x in 2002, the price had risen to \$6750; and in 2007, when WP wrote about the K-1xe, that version cost \$7000. This is only a small jump in price in five years, but it's still a bunch of change for a line preamplifier. It was therefore a no-brainer for Ayre to introduce a less expensive preamp, the K-5xe, which replaced the K-1's elaborate, mechanically coupled volume control and input switching with FET switches and metal-film resistors, while retaining the big model's fully balanced, zero-loop-feedback, all-discrete topology. Sam Tellig reviewed the K-5xe line preamplifier in May 2006 (Vol.29 No.5), when it cost \$2950, and enthused about its sound: "The Ayre K-5xe . . . just got out of the way. It's solid-state, as good as it gets. The sound is open, airy, and sweet."

I asked for a sample of the K-5xe so I could do a Follow-Up to Sam's review, but other review commitments kept getting in the way. When I finally spent some time with it (S/N 10J002), I found the sound a little on the robust, forward side, which made system matching problematic. Then, as I was about to spill some ink on the K-5xe, I got an e-mail from Charlie Hansen letting me know that the development of the QB-9 USB DAC had led them to rethink the K-5xe's design, and that Ayre would be sending a sample of what would be called the K-5xeMP. After a longer delay than I had anticipated, the K-5xeMP, priced at \$3500, arrived for review.

Waves

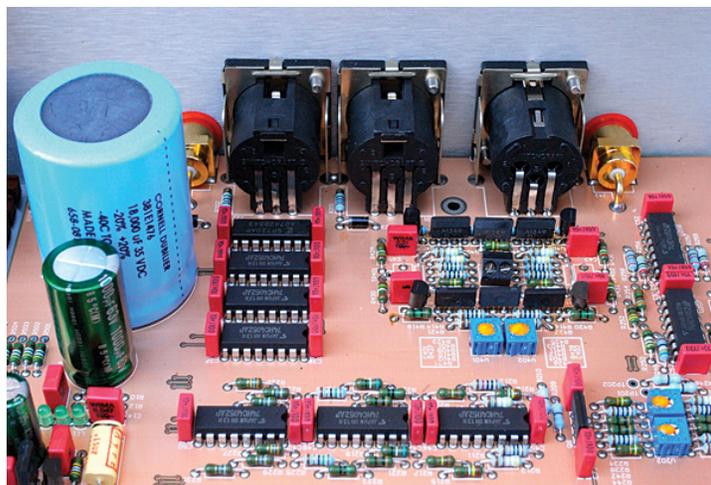
The new version of the K-5xe can be distinguished from the previous version by the "wave" logo that appears on the front panels of Ayre's digital products, below the Ayre logo, though the "MP" now stands for "Maximum Performance" rather than "Minimum Phase."

The primary difference between the MP and its predecessor concerns the amplifying devices. I'll let Charlie Hansen explain, as the story is a fascinating glimpse into how a high-end audio engineer develops a product:

"The K-5xe was the only non-power amp in our entire product range that did not use JFETs for the output (buffer) stage. The reason was that when we designed the K-5, we had just switched from FET outputs to bipolar transistors (BJTs) in our power amps and were extremely happy with the results. We figured that, since they worked so well in the power amps, we would also use them in the preamp.

When we were designing the analog circuitry for the [QB-9](#), I was determined to make a circuit with bipolar transistors that sounded as good as our JFET-based circuits, the reason being that Toshiba had

discontinued the low-noise P-channel JFETs that had been a staple of our designs. We made a lifetime buy of 500,000 pieces, which should last us somewhere between 50 and 100 years, but I still only want to use these parts when absolutely necessary.



When it came time to design the output (buffer) stage for the QB-9, we decided that the easiest thing for experimentation would be to start with the circuit used in the K-5xe rather than build something from scratch. We soon found (for reasons I still don't understand) that the simple complementary BJT emitter follower used in the K-5xe was holding back the performance of that whole unit. The easiest solution was to replace it with a pair of complementary JFET source followers, as found in, for example, the C-5xeMP, the K-1xe, or the KX-R.

Rather than use up the Toshiba JFETs, we found some US-made parts that sounded nearly identical. That is when I originally notified JA of the upgraded unit. We were just getting ready to ship it out to him when we ran it through the battery of measurements to make sure that all was well with the unit. That is when we found that the US-made JFETs caused the THD of the unit to double compared to either the Toshiba JFETs or the previous bipolar output stage. Their transconductance is only about one-third that of the Japanese parts, and this is apparently the source of the problem.

I wasn't happy about a *decrease* in the measured performance of an 'upgraded' product, no matter how much better it sounded. So we went through a long period of developing a circuit using bipolar transistors that would sound as good as the JFETs. We were finally able to do this, but at the cost of an extremely complex circuit. The final result was a great-sounding design [*it's used in the QB-9—Ed.*], but it was simply too complex to retrofit to the K-5xe in a manageable fashion.

So we are plundering our precious stash of Toshiba JFETs to make the MP upgrade to the K-5xe. It measures great, sounds great, and is easy to retrofit to existing units."—**Charles Hansen**

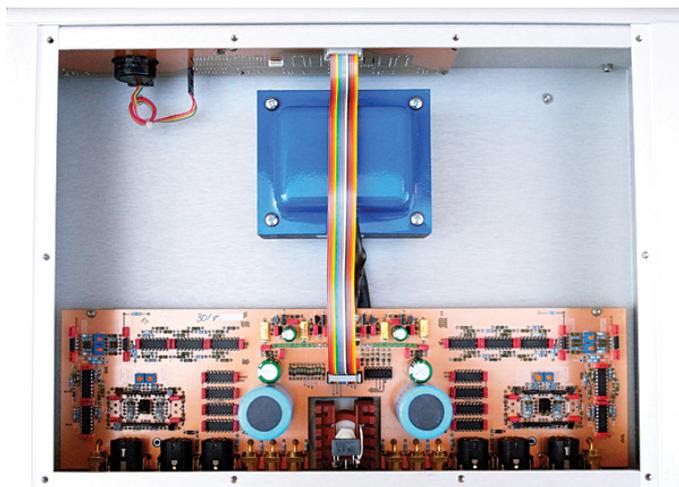
What

The K-5xeMP is an elegant-looking preamp conforming to Ayre's house style, with brushed aluminum panels set off by a central blue display. (A black-anodized finish adds \$250 to the price.) There are four inputs—two balanced, two single-ended—and both balanced and single-ended outputs. Unlike the K-5xe, the MP abandons the astronomical symbols used to identify the inputs and returns to the plain old B1, B2, S1, and S2 used on the original K-1. The input selector buttons select not just the desired source but also the ground connection on that input, minimizing noise pickup from the grounds of other sources. Also to reduce noise, the control microprocessor is awake only when executing a command from the front-panel buttons or the remote control.

Inside the chassis, the power supply and audio circuitry are carried on a large, double-sided printed-circuit board running the full width behind the rear panel, and mounted directly on it are all the input and output sockets. Unusually, this board is coated with clear solder mask, which I believe is because Ayre thinks this enhances ultimate sound quality. Other than the power supply, the layout is dual-mono, with wide physical separation between the left and right circuits. Through-hole components are used exclusively, the only surface-mount parts being on the control board behind the front panel.

The volume knob on the front panel operates a shaft encoder, and control signals from the front-panel board are passed to the audio board via a ribbon cable. The volume control operates with 66 steps of 1dB each, but there is also a fixed unity-gain Theater mode for use with surround-sound processors, which can be assigned to any of the inputs.

Both the volume control and the input switching appear to be implemented using 74HC4052 CMOS multiplexer chips, this a high-performance part with a low On resistance. Many, *many* years ago, I designed and built a small mixing console that used an early version of the 4052 chip for switching. One of the things I remembered was that the On resistance of those then-primitive FET switches was modulated by the signal—you needed to drive the 4502 with a buffer having a low source impedance and follow it with a stage having a high input impedance so that the modulation would not affect the signal. Looking at the Ayre's circuit board, the output buffer comprises two pairs of those valuable Toshiba JFETs for each channel, but there also seems to be a discrete buffer stage ahead of the array of 74HC4502 chips.



The interior of the chassis is dominated by a large power transformer painted blue. This is fed juice via Ayre's proprietary RFI filter, which is mounted behind the IEC AC socket. (This filter was also featured in the K-5xe.) Noticeable by their absence in the K-5xeMP's power supply are the usually ubiquitous three-terminal voltage-regulator chips; unless these are hidden under the board, it looks as if Ayre either doesn't use regulation for the voltage rails or uses discrete devices.

Why

It's the music that matters, of course, and with two of the three preamplifiers that had recently graced my system—Ayre's own [KX-R](#) (\$18,500) and Simaudio's two-chassis [Moon Evolution P-8](#) (\$15,000)—having been cost-no-object designs, I wasn't sure quite what to expect. As I have written before, the preamplifier is the heart of an audio system, determining the nature of the overall sound. And I had never got to grips with the forward balance of the K-5xeMP's predecessor.

But inserting the K-5xeMP into my system was a pleasant surprise, in that much of what I had appreciated about the much-higher-priced preamps had been preserved. In particular, the palpability of images and the sense of musical flow that had so impressed me with both the Simaudio P-8 and the Ayre KX-R was present with the K-5xeMP. Its deathly quiet backgrounds allowed the K-5xeMP to step out of the way of the music. Although it's become an audio-reviewing cliché, the Ayre's "blacks" were indeed blacker than the norm.

This allowed me to both clearly hear faults in recordings and, having identified them as faults, set them aside. A recording John Marks recently recommended to me is *Sure on This Shining Night*, a collection of choral works by the modern composer Morten Lauridsen, performed by Voce (CD, Voce 0026129719). While the vocal sound on this album is beautifully natural, the piano that accompanies the voices in some works is set a little too far back in the reverberant acoustic. Through poor systems, this gives the instrument too much of a "bathroomy" coloration, to the detriment of the music. But with the CD played on the [Ayre DX-5](#) player, fed to the K-5xeMP and the new Musical Fidelity AMS100 amplifier driving my 33-year-old pair of [Rogers LS3/5as](#), I could hear that the piano was set back in the stage, accept that it was too reverberant, and then forget that fact as I enjoyed some of my favorite modern classical

music—including the melodic "Dirait-on," from Lauridsen's *Les Chanson de Roses*. By contrast, the earlier version of the K-5xe pushed the piano forward in the soundstage so that it sounded both reverberant and a little closer than it should have, an aurally confusing combination.

The original K-5xe had great dynamics, lacking any sense of compression, and the K-5xeMP was its equal. Last Christmas, young Stephen Mejias, who hasn't yet given up on this incorrigible old fogey, gave me a copy of Four Tet's *There Is Love in You* (CD, Domino WIG254). Four Tet—actually a bloke from the UK called Kieran Hebden—is one of the new breed of "post-rock" musicians who operate as mixers and DJs, creating addictive aural soundscapes with found sounds (www.fourtet.net). The first track on this album, "Angel Echoes," begins with a four-to-the-bar kick drum and hi-hat beat over which a herky-jerky sampled female voice weaves hypnotic patterns. The earlier version of the Ayre preamp pushed the mix a little too forward at the listener; the MP kept the balance behind the speakers, but spread it wide and deep when appropriate.

Which

The natural competitor for the K-5xeMP (\$3500) is the Parasound Halo JC 2 preamplifier (\$4000), designed by John Curl. I [reviewed the JC 2](#) in March 2008, and felt its combination of superbly defined, well-extended low frequencies and delicate, high-precision stereo imaging made it a contender, though I did feel the transparency of its treble was a two-edged sword. The Parasound definitely worked best with amplifiers that were a touch on the warm side.

In direct comparison with the Ayre K-5xeMP, the Halo JC 2 definitely sounded on the lean side. When I listened to April's "[Recording of the Month](#)"—David Fray performing Mozart's Piano Concertos 22 and 25, with Jaap van Zweden conducting the Philharmonia Orchestra (CD, Virgin 5099964196404)—the Ayre preamp sounded warmer overall, with a more fleshed-out lower midrange that benefited the orchestral balance on this recording. While the Parasound's top octaves were a little more airy, the orchestra sounded leaner. Both preamps seemed equally good at representing recorded detail, however. The K-5xeMP's friendlier balance had not been achieved by smoothing things over, by relaxing into mellowness.

Did the Ayre sound *too* warm? A secret pleasure of mine is the Jacques Loussier Trio; I reached for their *The Best of Play Bach* (SACD/CD, Telarc SACD-65390), which has a rather *phat*-sounding double bass, balanced forward in the mix as if the player were in front of the rather metallic-sounding piano. But the bass didn't sound *too* phat with the Ayre. It held definition on the leading edges of the notes, so that the breakneck double-time bass figures at the end of Loussier's arrangement of the C Major Prelude didn't blur into one another. The K-5xeMP didn't sound dark in the way that my beloved but long-discontinued [Mark Levinson No.380S](#), now in residence in the storage closet next to my listening room, does.

Whatever

I was impressed by Ayre Acoustics' K-5xeMP. For what is these days a relatively affordable price, it offers much of the sound quality you can get from the megabucks solid-state preamps. While the original K-5xe was a solid Class B recommendation in *Stereophile's* "Recommended Components," this Maximum Performance version deserves a full Class A rating.