

Ayre KX-5/VX-5 Twenty

From a brand that promises product longevity as well as sonic excellence, here is a recently revised pre- and power combination that's packed with technical innovation
 Review: **Steve Harris** Lab: **Paul Miller**

All manufacturers are keen to tell you that they are different from the others, but Ayre does so more convincingly than most. And the KX-5 Twenty preamp and VX-5 Twenty power amp (each priced at £7495) exemplify this company's continuing advocacy of some unusual design approaches. Both the KX-5 and VX-5 appeared in their original form in 2013, but the improved 'Twenty' editions became available last year. As usual with Ayre, users were given the opportunity to upgrade rather than having to invest in a new product.

A NOVEL DESIGN

From the start, the KX-5 had included Ayre's big innovation in preamplification, its Variable Gain Transconductance (VGT) volume control, first seen in the flagship KX-R preamp back in 2008. Ayre's VGT circuit avoids the conventional use of an attenuator at the input. Instead, an FET stage converts the input voltage into a current and, in place of the fixed resistor that would typically be used to convert this back to a voltage output, Ayre uses a variable resistance.

This controls the volume by varying the amplifier gain, with the advantage that neither input impedance nor signal-to-noise are affected by the volume setting, and it allows for a very extended frequency response [see PM's Lab Report, p37].

In the original KX-5, Ayre used a line-level version of the Diamond output stage [see PM's boxout, facing page]. This was subsequently applied with some improvements in the first product to feature a 'Twenty series' update, the KX-R Twenty, before being included in the KX-5 Twenty. Also, the latter has acquired an AyreLock power supply regulator, which actively pulls the rails up and down in sympathy with the current drawn by the

audio circuit. So the output voltage of the regulator is said to be 'locked' regardless of any fluctuations in the load.

A final enhancement in the KX-5 Twenty is its servo-controlled DC offset, replacing the trim-pots used before. This is claimed to improve the sound, as well as keeping the DC offset to less than 15mV, and can compensate, up to a point, for incoming DC from a source component.

Closely resembling the AX-5 integrated [HFN Jun '14] but shallower front-to-back, the KX-5 embodies Ayre's clean, cool, almost Nordic casework styling. The left-hand rotary control is the source selector, cycling through a total of four balanced and two unbalanced line inputs, while the volume control is on the right.

On first switch-on, a set-up mode invites you to activate the inputs by naming them for your connected components, using the volume knob to scroll through a list of 24

three-letter codes that covers everything from AUX to DVD to TNR. In daily use the left-hand button switches on a tape output, its LED then lighting red, while a longer press re-enters set-up.

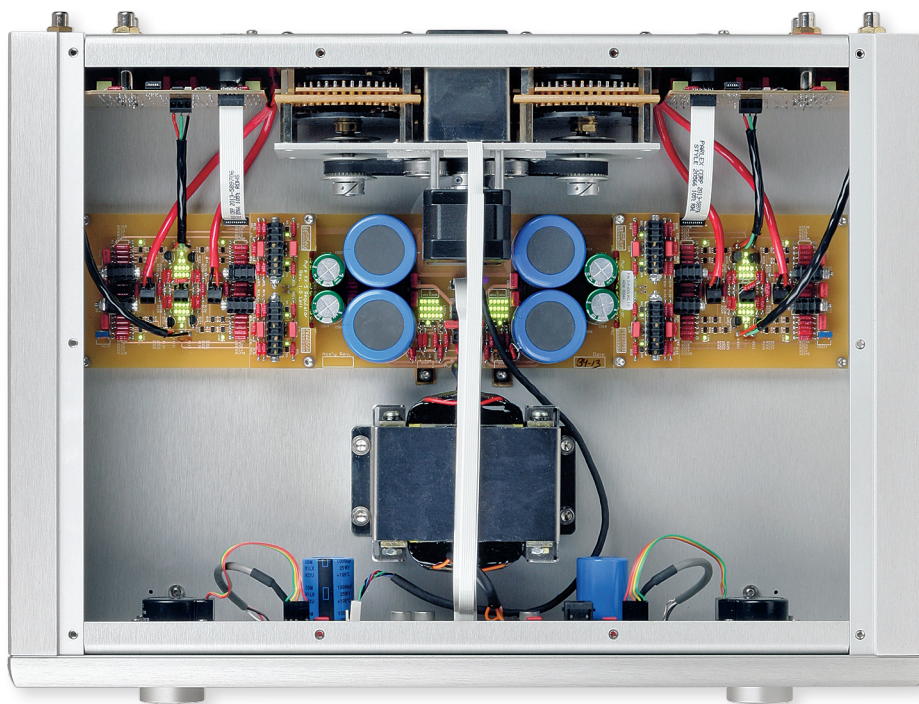
À LA CARTE MENU

A further advanced set-up mode allows you to enter custom names for the inputs, to set up a home theatre bypass option, to

match the sound levels of source components, or to activate the AyreLink connection for control of other Ayre components, or finally to reset to the factory default positions.

Ayre's VGT volume control behaves a little differently from the norm. The endless rotary encoder behind the knob governs the big motor-driven stepped rotary attenuators, one for each channel, at the back of the chassis. Volume is displayed as a number from 0 to 46, representing the gain steps. These are

'The KX-5 pre embodies Ayre's cool, clean, almost Nordic styling'



RIGHT: A key feature of the KX-5 preamp is its 46-step volume control (visible at the top of the picture) that, rather than attenuate the signal, directly adjusts the gain of the amplifier



1.5dB except for the lowest 12 positions, which have a gradually increasing step size to give a wide overall volume range. When changing the volume, you hear a clattering sound from the sturdy rotary switches – surprising at first, but ultimately seeming almost reassuring.

A quick press on the KX-5's right-hand button will mute (or unmute) the output, while a longer press puts the unit into low-power-consumption System Sleep mode, indicated by a green light. In this mode, AyreLink functions remain active, as do the tape and main outputs. All front-panel functions are duplicated on the chunky Ayre system IR remote [see p37], which can also control an Ayre disc player. It also allows you to dim the KX-5's display, with three levels of brightness and off.

At the back, along with the awesome array of four balanced XLR inputs per

channel plus two pairs of unbalanced RCA inputs, are two pairs of balanced main outputs plus one pair of balanced tape outputs, and one pair of RCA outputs. There are also two AyreLink ports for control of other Ayre products in a system.

SOLVING THE HEAT PROBLEM

Compared with Ayre's reference-level VX-R Twenty stereo power amp, the VX-5 Twenty doesn't boast the same level of cost-no-object choice of components, ultimate-quality circuit boards, or milled-from-solid casework. But you do get almost as much power and much of the technology, at around half the price.

Ayre's Diamond output stage, as used in the original VX-5, produced a lot of heat, which could become problematic in extreme climatic conditions – eg, the very high temperatures and high humidity

ABOVE: Ayre's preamp control layout is simple and makes for easy use, while both products look good with nicely-sculpted aluminium front panels and stainless steel fastenings

experienced in the Far East. But Ayre designed the Double Diamond output stage [see boxout below] to solve the heat issue, successfully reducing the operating temperature by 35%. It's also said to give a little more power, although the maker's rating is unchanged at 175W/8ohm or 350W/4ohm [again, see PM's Lab Report].

In operation, while the main power switch is on the rear panel, the fascia button provides a mute/unmute function and, with a logical similarity to the right button on the KX-5, this can be used to enter a low-power-consumption mode, shutting off the audio but still running the auxiliary functions. A nice refinement is the ability to set the brightness of the status LED in three levels.

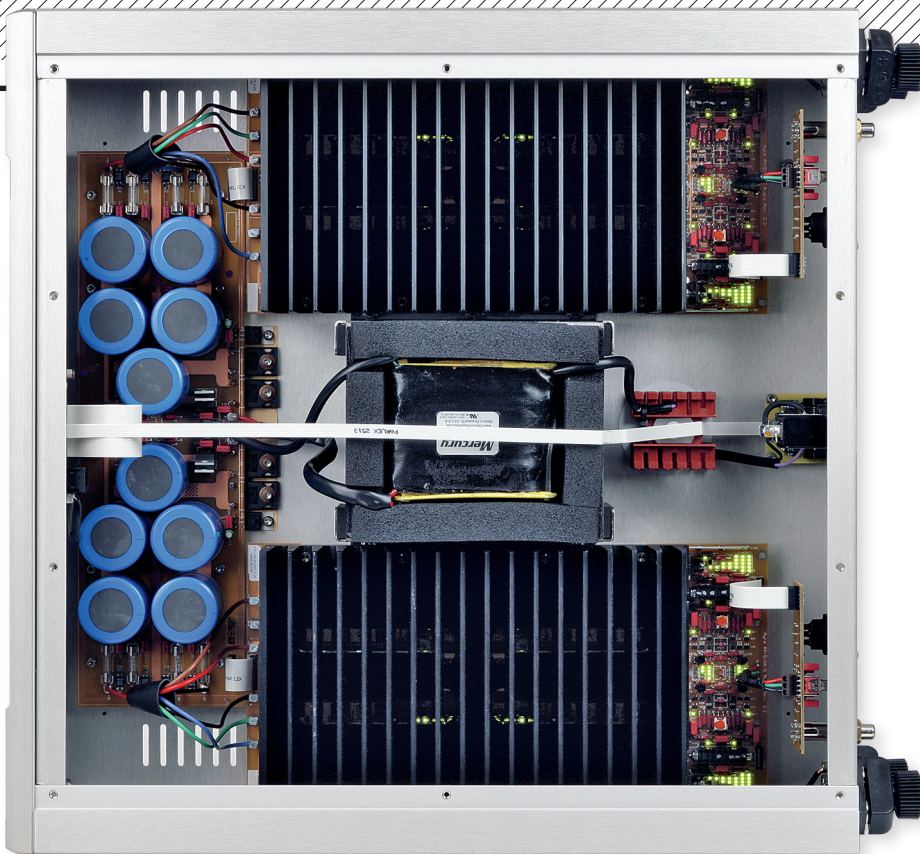
Also on the rear panel are balanced XLR inputs and a pair of RCA inputs which, like the RCA outputs on the KX-5, are for 'legacy equipment' as far as Ayre is concerned. A pair of tiny slide switches select balanced or unbalanced operation. There are two sets of speaker terminals per side, which accept spades or bare wires but not 4mm plugs, and two AyreLink ports.

GETS BETTER AND BETTER

Though it's proverbial that Ayre products need a long burn-in, the review samples fortunately already had plenty of hours on them. But in use they still needed a fair ➤

DOUBLE DIAMOND

Developed by Professor Richard Baker of MIT and patented in 1964 as 'A Gateable Bridge Network Having Power Gain', the original Diamond Circuit describes two pairs of bipolar transistors in a four-terminal bridge, or as cross-coupled complementary pairs. Envisaged as a unity voltage gain but high current gain buffer used in IC op-amp solutions to this day, when leveraged as a power amp stage it offers advantages over a standard complementary configuration, not least by avoiding bias (emitter) resistors. However, because the input and output transistor pair of the bridge need to be of the same type, this makes a Diamond power amp circuit more current-hungry, hotter running, and also a much tougher impedance for the preceding (voltage) amp stage to drive. Ayre biases its Diamond output section to operate in Class A/B but uses three pairs of output devices to significantly reduce the load on the driver stage. This buffer stage is also a Diamond configuration – hence the Double Diamond motif. PM



ABOVE: Ayre's 'Double Diamond' output stage, under the heatsinks, runs cooler than its 'Diamond' predecessor. Note Ayre's comprehensive use of (yellow) LEDs to bias the constant current sources

time to get warmed up, and just seemed to go on getting better through each of the listening sessions.

For example, after hooking up the Hegel Mohican CD player [*HFN* Oct '16] and B&W CM10 speakers [*HFN* Sep '13], the first disc I put on happened to be Brahms's Symphony No 1 with Haitink and the LSO [LSO Live LSO 0045]. Not perhaps the most ingratiating of orchestral recordings anyway, and when everything was stone cold it was only just listenable. But when I returned to it a very few hours later, it was transformed!

Now the music made sense, the Ayre combination seemingly de-congesting the orchestra, allowing a real sweetness and delicacy to come through in the slow movement and making the best of the Barbican acoustics. Clearly the KX-5/VX-5 Twenty pre/power combination could produce a huge and well-filled soundstage and effortless dynamics.

Dark Side Of The Moon [Parlophone 7243582136 2] became totally absorbing, and after the manic scurrying synth of 'On The Run' I couldn't help turning up the volume for the clocks at the beginning of 'Time'. I wasn't disappointed as the gongs and chimes all just leapt out of the space around and behind the speakers.

'You could really feel the spontaneity of this live event'

Again and again, the Ayre amplifier combination seemed able to bring you a *performance*, rather than a mere recording. A good example was *Rocksteady* [Telarc SACD-63581], pianist Monty Alexander's 2004 reunion album with Jamaican guitar great Ernest Ranglin, recorded live in the studio with no overdubs. Here you could really feel the spontaneity of the event, the immediacy of the music, and the

body-moving impact of a rhythm section that was cooking right there.

LAYERS EXPOSED

Moving on to 1980s pop, and Rosie Vela's *Zazu* [A&M CDA 5016], the KX-5/VX-5 did a great

job of elucidating Gary Katz's production and the skilful contributions of Becker and Fagen, laying out a wide stereo picture full of interest and detail around the well-mannered vocals.

On many a familiar recording, the Ayre seemed able to uncover new layers of expression, with a sound that was free and effortless – sometimes in fact free of a subtle, insidious 'electronic' quality or tightness that you might have previously suspected to be inherent in the recording. I thought of this when listening to the immaculate 2003 production of *Ultimate Mancini* [Concord SACD-1034-6], which ➔

CHARLES HANSEN

In the early 1990s, Charles Hansen made his mark on the high-end scene as designer of the original Avalon Ascent and Eclipse speakers. He then quit the speaker business and, believing that solid-state electronics gave the most scope for innovation and progress in design, set up Ayre in 1993.

As he put it, 'Instead of being hobbled with the limitations of tubes, Ayre's approach has been to understand precisely what tubes are doing better than transistors, and then solve those problems on a fundamental level – not simply apply band-aids to hide the flaws.'

All of Ayre's technologies are built on a clear foundation that includes 'zero' feedback, the importance of the PSU, and fully-complementary, fully-balanced circuit design.

'Not only do we avoid the gradual degradation in performance of tubes, but we're also able to eliminate the magnetic materials used in tubes, and all of the coupling capacitors required to block the DC voltages between stages,' says Hansen. 'These problems cannot be avoided with tube designs. They can only be solved by using transistors.'

Hansen has confidently described Ayre's KX-R preamp as 'Truly revolutionary, the first solid-state product that actually sounds better than the very best tubed designs in the opinion of many.' And Ayre has continued to innovate. Says Hansen, 'The Twenty series is really a culmination of a wide variety of technologies that we have developed over more than two decades of continuous R&D.'

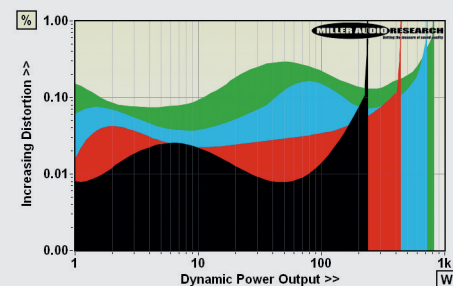


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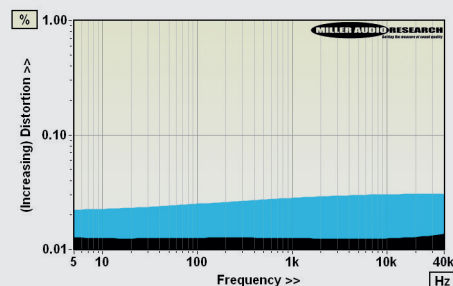
AYRE KX-5/VX-5 TWENTY

Ayre's 'Double Diamond' output stage configuration, along with its other circuit innovations, typically results in a fairly characteristic technical 'fingerprint'. So the VX-5 Twenty power amp is reminiscent of the AX-5 Twenty integrated [HFN Jun '14], albeit more powerful at 2x210W/8ohm and 2x340W/4ohm versus 130W and 225W, respectively. Distortion climbs gently with output from 0.007%/1W to 0.026%/10W and then holds steady to about 125W, although this behaviour is somewhat dependent on load, as the 240W, 445W, 720W and 820W (8, 4, 2 and 1ohm) dynamic output profile illustrates [see Graph 1, below]. Nevertheless, the VX-5 is clearly both powerful and load-tolerant. Furthermore, like the AX-5, the VX-5 boasts a very flat and extended response that reaches out to 100kHz with a drop of a mere -0.5dB (and just -0.2dB/100kHz into a 1ohm load) while mining down to <1Hz with no loss. To all intents and purposes this is a DC-coupled amplifier with an offset of just -20mV. The output impedance is not especially low – so there will be some variation in overall amp/speaker system response – but it is steady at 0.16ohm.

So what impact does the KX-5 bring to the partnership? Minimal extra 'colour', frankly, as it offers very low noise (91.2dB A-wtd S/N, re. 0dBV), lower and very consistent THD versus frequency [see black trace, Graph 2 below] at ~0.013% (20Hz-20kHz at 0dBV out), and a ruler-flat response of within one-hundredth of a dB from 1Hz-100kHz. Distortion does increase with increasing input/output voltage, however, from 0.003% at 100mV to 0.014% at 1V and 0.13% at 10V (all at 1kHz/47kohm), although its composition is almost purely 2nd harmonic and that from the VX-5, 3rd harmonic. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green). Maximum current is 28.6A



ABOVE: THD versus extended frequency; KX-5 (1V out, black trace) and VX-5 (10W/8ohm, blue trace)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	210W / 340W
Dynamic power (<1% THD, 8/4/2/1ohm)	240W / 445W / 720W / 820W
Output imp. (20Hz-20kHz, KX-5/VX-5)	76ohm / 0.155-0.164ohm
Freq. resp. (20Hz-100kHz, KX-5/VX-5)	+0.0 to -0.0dB / +0.0 to -0.60dB
Input sensitivity (for 0dBV/0dBW)	505mV / 153mV (balanced)
A-wtd S/N ratio (for 0dBV/0dBW)	91.2dB (KX-5) / 90.0dB (VX-5)
Distortion (20Hz-20kHz, 1V/10W)	0.0124-0.0127% / 0.023-0.030%
Power consumption (Idle/Rated o/p)	123W / 595W (KX-5, 24W)
Dimensions (WHD, KX-5/VX-5)	440x100x340/440x120x480mm



ABOVE: The preamp (top) offers six line inputs (two on RCA, four balanced on XLR) together with tape monitoring and three line outputs (two XLR/one RCA). The power amp (below) has pairs of speaker-clamping posts, better suited to bare wire than plugs, plus balanced and single-ended (RCA) ins. 'Ayre Link' comms syncs switch on

features a great orchestra studded with guest stars. It kicks off with a lovingly re-created and extended version of 'The Pink Panther Theme', and here saxophonist Plas Johnson was just right there, tangibly between the two loudspeakers.

A NATURAL COHERENCE

Rounding up some of the usual suspects, I put on Rebecca Pidgeon and *The Raven* [Chesky SACD 329]. In the opening 'Kalerka' it was striking to hear the studio echo on the vocal freshly revealed, to the point where I thought that if a real studio type had been listening he'd probably have been able to identify the kit that Chesky had used. The bass had an almost delicate, dancing quality, if that makes sense; anyway, it had real rhythm and a natural coherence.

And that could also be said of the driving percussion on 'The Witch', which follows. And while the Ayre combination gave me a renewed appreciation of Pidgeon's youthful and engaging vocals, it also had me admiring the skills of the accompanists: for example co-producer Joel Diamond's great piano on 'You Need Me There', and the superb jazzy beat on 'Grandmother'.

With 'You'd Be So Nice To Come Home To' from *Art Pepper Meets The Rhythm Section* [reissued on Contemporary 0025218633826 from 1988], suddenly the rhythm trio's intro seemed neater and spicier than ever. Here the Ayre pre/

power seemed to transcend the extreme left/right nature of the stereo as the saxophonist's solo line unfolded from the left speaker with such logic and continuity. On the right, the 'rhythm section' trio didn't seem bunched up in a corner as they often can do, but instead the piano, bass and drums each clearly seemed to occupy a real space, and with this relaxed, natural sense of positioning came a truly immediate and tangibly real quality in the sound of each of the instruments.

Given any recording with a good string bass sound, the Ayre combination really seemed to sing. You could experience this on many tracks from Esperanza Spalding's 2010 album *Chamber Music Society* [Heads Up HU-31810-02], but especially on Jobim's 'Inutil Paisagem', where her own acoustic bass is the only accompaniment. Here, its sound – like the whole recording – was rich, sonorous, rhythmic, completely satisfying. ☺

HI-FI NEWS VERDICT

This is a stellar pre/power duo in which the musical rewards justify both the asking price and the complexity of the design. Above all, the music flows freely with natural, unforced dynamics and an exceptionally natural sense of rhythm and timing. While the VX-5 offers ample power, the KX-5 pre is easy to use with well thought-out facilities. It's nothing less than a truly outstanding amplifier combination.

Sound Quality: 85%

