

Ayre AX-5 Twenty

The Colorado company celebrates its platinum anniversary with a reworked version of a fully balanced integrated that sent the preamp stage packing. Another class act?

Review: **David Price** Lab: **Paul Miller**

Back in 1993, Charles Hansen – the designer and founder of respected US loudspeaker specialist Avalon Acoustics – formed Ayre Acoustics. Over the 25 years that followed, he built up the brand, adding a range of innovative preamps, power amplifiers and integrated designs, all descended from the company's original 'zero-negative feedback' V-1 power amplifier. Bolstering the current lineup are various digital sources, such as the Ayre QX-5 Twenty USB/streaming DAC [*HFN* Dec '17], phono stages, and head-fi products like the Codex DAC/headphone preamp [*HFN* Jul '16] – all at prices that indicate they're not aimed at the mass market.

Charles passed away at the end of 2017, but the company, which is based in Boulder, Colorado, was already advanced in its plans to celebrate the brand's illustrious history, having launched the £14,750 AX-5 Twenty integrated amp in 2016 to mark its 20th anniversary. A replacement for the AX-5 [*HFN* Jun '14], it's an integrated whose size, weight and cosmetics bear all the hallmarks of the American high-end.

DOUBLE ACT

This is nothing if not a big and chunky product. Measuring 440x120x480mm (whd) it tips the scales at 22kg, which is sufficient to make you not want to keep moving it around once you have it unpacked and in your listening room. The quality of finish is excellent, and even if it does have something of a 'hand made' feel compared with the ultra-slick finishes found on some other premium components, in this case it adds character.

Toting a claimed 125W per channel into 8ohm, and twice that into 4ohm [see PM's Lab Report, p59], most people will struggle to find a loudspeaker to stretch it. Indeed this fully discrete, fully balanced, 'zero-

feedback' amplifier is something of a wolf in sheep's clothing, packing innovative tech such as a revised version of the Diamond output stage used in the AX-5 – now renamed the 'Double Diamond' and said to run cooler – and EquiLock circuitry. It also employs the Variable Gain Technology found in the Ayre KX-R preamplifier in the power amplifier section [see boxout, p57].

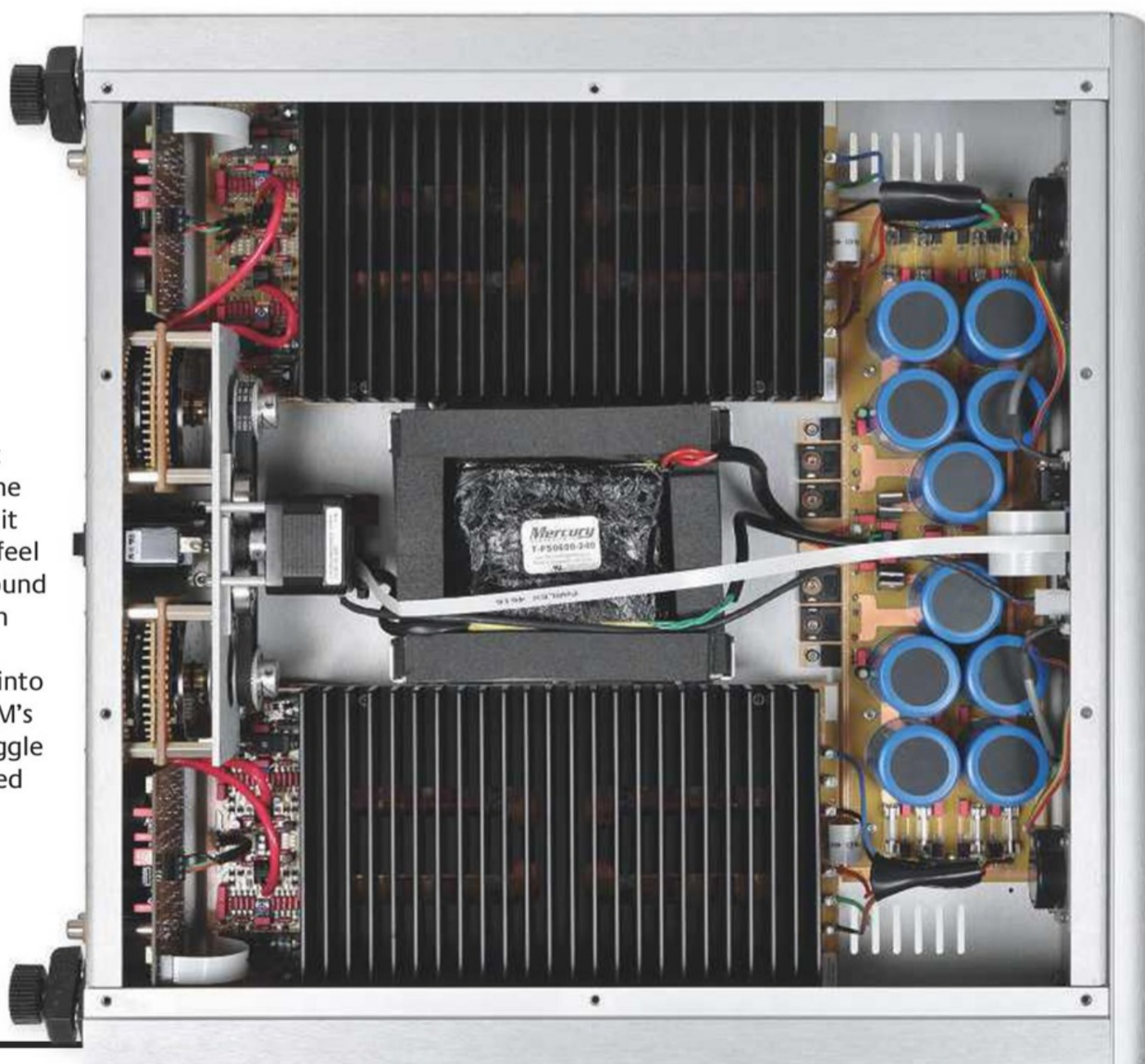
Fresh out of the box, the AX-5 Twenty needs configuring and won't work until you've assigned names to the inputs. If this stage has been overlooked then the amp automatically starts up in set-up mode. You're asked how many of its six inputs you wish to use, as you run through a procedure that names each one. This makes sense, but only up to a point since the menu of preset names includes some

pretty arcane choices. Why, for example, is there both 'CD' and 'CDR', and does anyone use 'DAT' anymore?

CHARM SCHOOL

You can also assign your own names to inputs, but this is a more involved process and there's a maximum of three characters allowed, which in 2020 feels unnecessarily limiting. Also, the fact that the display is an old-fashioned alphanumeric digital type makes this process even more of a chore. Indeed, by modern standards the whole procedure feels clunky, though some might find they warm to its old-school charm!

The fascia looks swish, and the knobs for source and stepwise volume have a nice action. Only the big blue LED display looks dated. Its saving grace is that it's large



RIGHT: The balanced 'Double Diamond' amplifier modules are embedded under heatsinks [top and bottom]. Motorised belt-driven Shallco (silver) switches govern the stepped L/R gain controls [left]



and so can be seen easily across the room. Handily, you can also control its brightness from the partnering, and reassuringly solid remote control [see p59]. Aside from the two big rotary controls, you get two buttons either side of the display, the left handling tape outputs and set-up, and the right mute and standby – both depending on whether you give the button a short or a long press. As for the power switch, this is to be found on the rear of the amp, along with four balanced and two single-ended line inputs, plus balanced loudspeaker terminals. These are joined by tape outputs on balanced XLR sockets and two AyreLink remote switching ports.

LIGHT FANTASTIC

There is little sense of the AX-5 Twenty being a 'character amplifier', one that thrusts its personality at the listener.

'Most will struggle to find a loudspeaker to stretch it'

Rather, it's remarkably even-handed and thorough in the way it makes music, never adding colour or stripping recordings of their textures and dynamics. The result is a big, powerful and articulate presentation that shines a light into the recesses of the most complex of mixes yet at the same time never dazzling the listener.

Of all its talents, the most noteworthy have to be its power and sheer dynamic headroom. There are few amplifiers at any price that seem completely at ease with themselves, yet this is one of them. Kraftwerk's 'Techno Pop' [*Electric Cafe (Deutsche Version)*; Kling Klang CDP 564-746420 2] is a veritable sonic work-out for any hi-fi system thanks to its enormous tracts of deep bass and fist-clenching dynamics, yet so unflustered was the AX-5 Twenty that it might as well have

ABOVE: Rotary encoders are for source selection and volume, plus navigation of the setup menu when in standby. Push buttons are for tape output on/off and mute/standby

been handling some easy listening music – Barry White maybe? – at dinner party levels. What's more, while it delivered its power effortlessly, it never sounded either louche or overly laid-back.

SEALING THE DEAL

I've heard a number of big, barrel-chested amplifiers over the years, and some of them – despite their power – have seemed almost uninterested in the job in hand. Grace Jones' 'Slave To The Rhythm' [*Island Life*; Island Records 842 453-2] can sound like an over-produced dirge via some amps but here I was treated to a seriously engaging and propulsive sound. There was a lot of physicality to the proceedings, but Ayre's AX-5 Twenty was able to track the song's dynamics very well –

resulting in a performance that was not just lively but downright compelling.

As the song reached a crescendo, this mighty integrated just kept on pushing, and proved really adept at conveying the emotional side of the music too. Throughout the track, Grace Jones' vocals have a brooding quality that sometimes build up

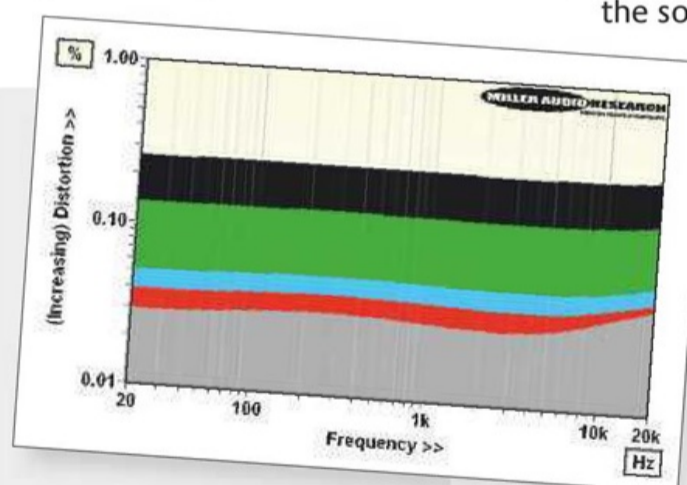
to an almost angry intensity, and this was conveyed perfectly. So the AX-5 Twenty is far from being a big-booted but flat-footed bruiser. Rather, it can really rock out and make music fun.

There are more admirable facets to its character that seal the deal. First is detail retrieval. There's a sense that you can hear into the music in a way that few integrated amps at any price enable you to. Steely Dan's 'Home At Last' [*Aja*; MCA Records 088 112 056-2] was a real treat, the amp revealing all the grain in singer Donald

POLISHED DIAMOND

Patented in the 1960s by Prof. Richard Baker of MIT, the 'Gateable Bridge Network Having Power Gain' (or Diamond Circuit) describes two pairs of bipolar transistors with tied emitters and bases. Still used in unity gain op-amp ICs to boost current rather than voltage output, the technique remains rare in higher power amplifier circuits. While there are advantages in the reduction of common-mode noise and distortion, the bridged output is necessarily floating, so the AX-5 Twenty should not be connected to any speaker that has a ground (including electrostatics or many with active bass systems).

Its other 'feature', VGT or Variable Gain Transconductance, is a method of offering control over volume without simply attenuating the full gain of the preceding preamp section. Here a stepwise resistor ladder governs the *gain* of the power amp's FET-based input – innovative, but with variable gain comes variable compensation (feedback) and so distortion changes with volume setting even if the output power is unchanged. For example, for a fixed 10W power output, the lowest distortion (0.03%/1kHz) is achieved at the maximum volume position '46' (+31dB gain), increasing very slightly to 0.04% at '40' (+22dB gain) before advancing to 0.05% at '38' (+19dB gain), 0.14% at '34' (+13dB gain) and 0.26% at '32' (+10dB gain). This is clearly illustrated by the inset Graph where grey is 'Vol 46'; red, '40'; cyan, '38'; green, '34' and black is 'Vol 32'. PM



AYRE AX-5 TWENTY



ABOVE: Cardas speaker terminals are joined by four balanced and two single-ended line inputs, plus tape out XLRs. The RJ-11 sockets provide 'AyreLink' system comms

Fagen's voice, yet ensuring the vocal performance never sounded brittle. The piano work was vibrant and you could hear the slight echo to it better than usual. The percussion seemed more direct and had a more believable, tangible quality, too. All these relatively small details came together to give the song much more of a believable feel, it seeming less processed than when heard through many of the high-end solid-state amplifiers that have passed through my listening room.

TRUE GRIP

It's important to point out that the AX-5 Twenty is not especially tonally bright. It certainly casts a clean white light on things, but the luminance – if you can call it that – is just right. There's no sense of wishing you had a smoother DAC or turntable as source, or a pair of warmer-sounding loudspeakers.

Indeed, I found I could play 'well-lit' tracks, such as Annie Lennox's Grammy Award-winning cover of 'No More "I Love You's"' [*Medusa*; RCA BVCP-796] and not need to take cover behind the sofa with my fingers in my ears. This amplifier's even tone is much appreciated, because some big transistor designs can sound a little harsh with this track, especially at higher volumes.

Only in the bass could the AX-5 Twenty be said to fall a little short. While the low end is big and strong there are times when it's not quite as tight as one might like. I noted this particularly with my hard-to-

LEFT: The Ayre system remote governs menu navigation, input, volume and display brightness here



drive, infinite baffle Yamaha NS-1000M loudspeakers, where it didn't quite have the stop/start speed of some cost-no-object solid-state designs I've tried. But with my Quad ESL-989 electrostatics this proved much less of an issue and by most standards bass performance is very good indeed. It's just that there's nowhere to hide at this price.

The last aspect of the AX-5 Twenty's performance that caught my ear is its soundstaging. This is highly impressive, and goes back to the amplifier's overall sense of grip and effortless power. It drove my big NS-1000Ms like they were tiny little Wharfedale Diamonds, absolutely commanding them. This in turn made for a superb rendition of the recorded acoustic of Crosby, Stills, Nash & Young's 'Country Girl' [*Deja Vu*; Atlantic 7567-82649-2].

By no means would you call this an audiophile recording, yet the AX-5 Twenty picked through the murky soundscape to give a really clean, architectural sound with everything neatly in its place. There was no sense of instruments being placed in the mix incorrectly, or indeed vaguely. Instead, everything was practically nailed down to the floor. Depth perspective was impressively good too, giving a really immersive feel to this classic track. ⏵

HI-FI NEWS VERDICT

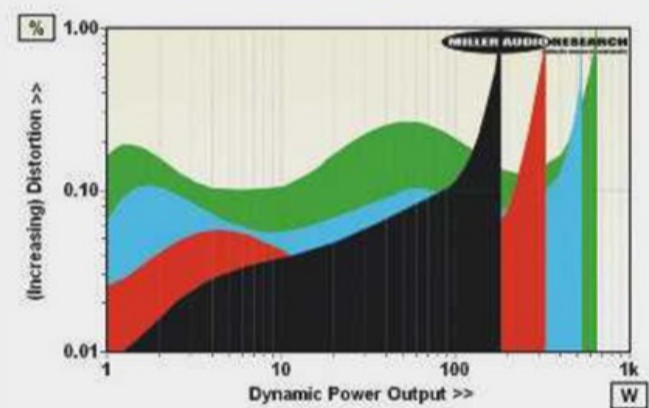
Ayre's AX-5 Twenty is nothing if not a special-sounding amp. It may not be the world's most versatile integrated and its ergonomics are quirky to say the least, yet it gets on with the job of serving up serious amounts of power and detail, allied to fine dynamics, in an enjoyable and authoritative way. Factor in its use of innovative tech plus its sturdy build and it's an impressive package – even at this price.

Sound Quality: 85%

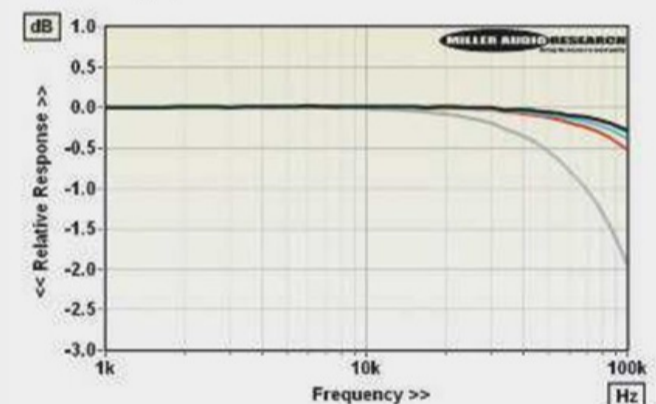


While the anniversary celebrated by this 'Twenty' version of the AX-5 integrated has long since passed, comparisons with the original AX-5 [*HFN* Jun '14] reveal potentially far greater revisions to both the VGT (Variable Gain Transconductance) 'volume control' and 'Double Diamond' output stage than suggested by Ayre itself. Both these circuit innovations combine to create a very distinctive technical fingerprint for the AX-5 and its successor – noise, for example, is exceptionally low and the A-wtd S/N correspondingly wide at 101dB (re. 0dBW) while distortion is purely 2nd/3rd harmonic. Distortion is very consistent with frequency but not with output level or applied gain [see boxout, p57]. For example, THD is as low as 0.009% at 1W/8ohm but increases to 0.04%/10W and 0.13%/100W (all from 20Hz-10kHz). The output impedance is also very flat at 0.150-0.155ohm (20Hz-20kHz), increasing slightly to 0.185ohm/100kHz, but the response [see Graph 2, below] gets flatter and more extended the lower the gain (lower VGT setting), from -2.0dB/100kHz (vol = 46) to -0.3dB/100kHz (vol = 32).

Power output is higher than achieved by the AX-5, and its load tolerance is significantly enhanced, despite the 125W/8ohm specification remaining unchanged. The AX-5 Twenty achieves 2x155W/8ohm and 2x250W/4ohm with a boost to 183W, 335W, 535W and 650W into 8, 4, 2 and 1ohm loads under dynamic conditions (the AX-5 managed 160W, 280W, 215W and 125W, respectively). This is clearly illustrated [Graph 1, below] as is the variation in distortion both with output level and decreasing load impedance. I would expect the sound of the AX-5 Twenty to vary slightly with speaker load and volume setting. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 25.5A



ABOVE: HF resp. from 1k-100kHz at 10W/8ohm (grey, Vol '46'; red, '40'; cyan, '38'; green, '34'; black, '32')

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	155W / 250W
Dynamic power (<1% THD, 8/4/2/1ohm)	183W / 335W / 535W / 650W
Output imp. (20Hz-20kHz/100kHz)	0.150-0.155ohm / 0.185ohm
Freq. resp. (20Hz-20kHz/100kHz)	+0.0dB to -0.09dB/-1.85dB
Input sensitivity (for 0dBW/125W)	81mV / 905mV (balanced)
A-wtd S/N ratio (re. 0dBW/125W)	100.9dB / 121.9dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.038-0.048%
Power consumption (Idle/Rated o/p)	113W / 435W (31W standby)
Dimensions (WHD) / Weight	440x120x480mm / 22kg