

Aaron XX 20th ANNIVERSARY

INTEGRATED AMPLIFIER

In the beginning there was Sovereign and then there was Neumann Audio-technik and then, finally, when Marita and Thomas Hoehne saw that it was all good, they created Aaron.

Yes, I know this introduction sounds a bit biblical, but that's exactly what Aaron's history seems like to me. When German couple Marita and Thomas Hoehne started their company—High End Unterhaltungselektronik Vertrieb GmbH—in 1986 to build high-end hi-fi equipment, they decided that their high-end brand would be called Sovereign. However, after having hired Marcus Neumann to design the amplifier, he did such a great job for them that they decided to use his name as the brand: a decision complicated only by the fact that there already existed a very famous German company called Neumann, founded in 1928 by the genius inventor and audio pioneer Georg Neumann who, amongst other things, developed record-cutting machines, rechargeable batteries and high-end studio microphones.

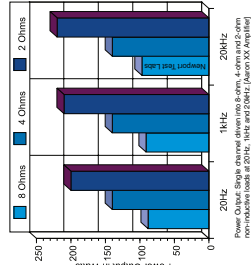
As a result of the naming conflict, Marita, Thomas and Marcus decided to use the

brand-name 'Neumann Audio-technik' to distinguish it from the already-established Neumann Berlin. After Marcus Neumann left the company in the late 1980s, the Hoehnes hired a new designer and resurrected their original brand name. Thus it was that the very first amplifier to be produced was the curiously named 'Sovereign The First'.

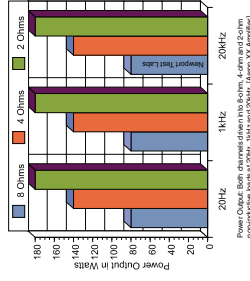
Shortly after the Sovereign The First had gone into production, the Hoehnes decided to up stakes from Germany and move to Holland, where they settled in Hertogenbosch

and re-commenced amplifier production with yet another designer. It seems that these changes required yet another brand name, and this is how the Aaron No 1 integrated amplifier came into being, with the first 'No 1' finally rolling off the production line in 1989. Since then, Thomas Hoehne has constantly been having to tell inquirers that the name has no 'biblical' interferences, and that he chose it simply because he'd figured that in English-speaking markets, a brand beginning with two 'A's would always come first in any alphabetical listing!

One naming schema that has remained unchanged in the 15 years the Hoehnes' have been in the high-end business is their penchant for numbering their products in the order in which they're made, so although Aaron No 1 was an integrated amplifier, the Aaron No 2 was a preamplifier, the Aaron Nos 3 and 4 were power amplifiers and the Aaron No 5 was another integrated amplifier. Curiously, when the company decided in 1990 that it should have a phono stage in its lineup, it broke with this tradition and named it the 'Aaron Phono Module'.



In a reprise of the Neumann brand naming conflict, Aaron found that when it started exporting to Australia, there was a difficulty with the Aaron brand name because it was already in use by Betec Industries, which had been building Aaron hi-fi loudspeakers in Australia since 1980. (Apparently, the two manufacturers have since decided that because Aaron [Holland] doesn't make speakers and Aaron [Australia] doesn't make amplifiers, there is little likelihood of consumers confusing one with the other, so they've



fier is switched off, while the even-more-curious anodised square plate on the top surface contradictorily makes it look like a top-loading CD player when it's switched on... but perhaps that's just me. As for those two cone-shaped protrusions on the front panel, I can only assume they're an 'homage' to the redoubtable Madonna Louise Ciccone, because I can think of no sensible ergonomic rationale for using them.

The two cones are, of course, necessary to control input switching (left) and volume (right). The input switching is comprehensive, with positions for Aux, TV, Tuner, DAT, MD and CD. The input you select is briefly displayed in the front-panel display after which the display reverts to showing the volume level. The rotary action is not continuous, so once you rotate the cone as far as it can go in one direction or the other (thus reaching either 'Aux' or 'CD' depending on the direction of rotation) you then have to reverse direction. The volume control's action is smooth, and the volume level is displayed in dB, with a minimum setting of from -60.

Adjustment is in 3dB steps to -36dB, after which volume increases in 2dB steps to -12dB, after which it reverts to 1dB steps. Both controls worked perfectly, except that I found them both exceptionally difficult to turn, thanks to their ultra-smooth anodised metal surfaces and conical shape. One neat convenience feature on the Aaron XX is that you can program in 'offset' attenuation volume levels for each input, so that you can ensure the sound level remains the same when you switch between, say, 'Aux' and 'CD'. According to the manual, you can also individually adjust the balance of the left and right channels for each of the six sources, but I could not get this function to work, despite repeated tries and repeated readings of the sparse manual. Neither could I get

reported assumed a 'live and let live' stance to avoid expensive litigation.)

So how did the 'XX' come about? This model was released to celebrate the company's 20th anniversary. It's similar enough to the Model 1a that the manual supplied with it is exactly the same one provided with the Model 1a. And if you were wondering how 'XX' should be pronounced, Marita and Thomas say that they'd prefer you to say 'double ex', and not 'ex ex' or 'two ex'.

THE EQUIPMENT

The design of the Aaron XX is curious, to say the least, because the shape and size of the front-panel display makes it look like a front-loading CD player when the ampli-

AARON XX 20th ANNIVERSARY INTEGRATED AMPLIFIER

Brand: Aaron
Model: XX

Category: Integrated Amplifier
Warranty: Two Years

Distributor: Wicked Digital Pty Ltd
Address: Suite 118, 40 Yeo Street
Neutral Bay NSW 2089

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• Great sound
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LAB REPORT

Readers interested in a full technical appraisal of the performance of the Aaron XX Integrated Amplifier should continue on and read the LABORATORY REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.



Lab Report on page 34

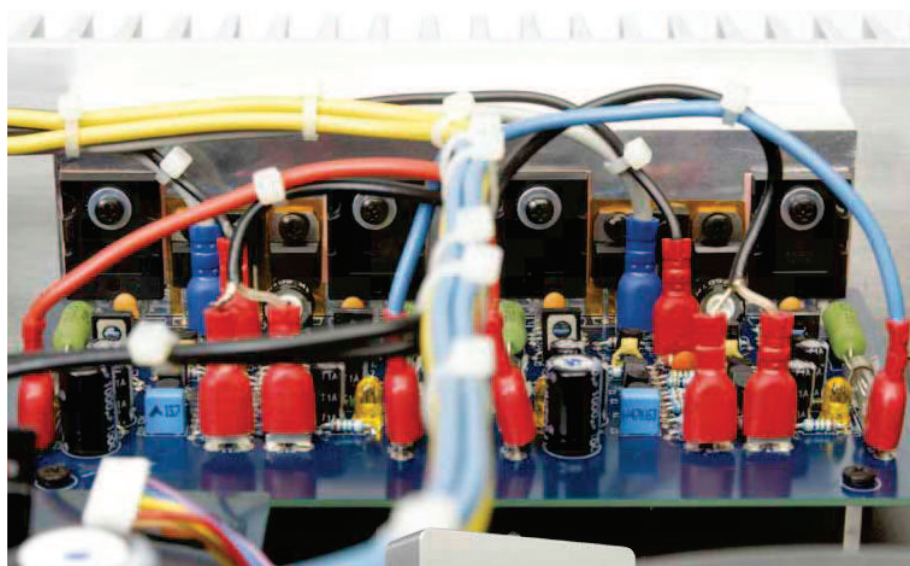
the 'Processor' function to work, so if either of these two functions are important to you, make sure you get your dealer to show you how to get them to work.

The remote is quite basic, as you'd expect for an integrated amplifier, but it's very high-quality and made from metal—in other words, not the usual 'plastic OEM' type. Also, in Australia, the remote is included in the price of the amplifier. (According to local distributor Wicked Digital, elsewhere in the world the remote is an added-cost extra.)

LISTENING SESSIONS

After letting the Aaron XX 'burn in' for a few days, the first thing I did was crank up the volume on a few of my favourites to see if the XX could deliver the kind of power I like in a stereo amplifier. No worries! It delivered all the power I could want and more. Even when I pulled my cruellest trick, that of paralleling three pairs of loudspeakers to create the 'load from hell', the Aaron XX just continued delivering clean, distortion-free sound, no matter how far I turned the volume control clockwise. I could tell I was driving the amplifier pretty hard because it was starting to get fairly warm by this stage... but not uncomfortably so.

After I had reverted to my standard listening set-up, I paid some serious attention to the quality of the bass, and can report it was outstanding. The deepest organ notes on SACD were reproduced pitch-perfect and with deep authority. Kick-drum was similarly impressive, with the XX reacting instantly and never holding onto the strike. As for low-frequency tonal quality, I found it completely accurate, using both piano, double-bass and cello. For cello, I used—as regular readers have probably already guessed already—Bach's Cello Suites. I have many versions, Pablo Casals, Paul Tortelier, Yo Yo Ma, Jian Wang, Janos Starker... and all have something to recommend them. I often decide I like one the best, but then a year later, I've changed my mind. What is certain is that when you listen to the Suites using the XX and a superb pair of floor-standing speakers, you'll be getting as close to the real



■ I was deeply impressed by the Aaron XX's sound quality, performance, and also build quality...

thing as possible. I certainly found the sound of the Aaron XX was wonderful with Casals and Yo Yo Ma, which were the only two versions I auditioned for this review, as they're my current favourites.

That trait remained true into the midrange and beyond, with the Aaron XX rendering singing (and speaking) voices with incredible clarity. I have some old recordings of poets reading their own poetry and the recordings are so poor that it's often difficult to understand some words unless you already know the poem. Listening with the Aaron XX it seemed to me that it was easier to understand the words, despite the quality of the recording. And with a good recording of a singer, particularly a female vocalist, the Aaron XX

delivers all the nuances that differentiate an 'artist' from a 'singer' and a 'true' hi-fi system from one that's not.

I was deeply impressed by the Aaron XX: obviously by its sound quality and performance during my auditions, which I couldn't fault, but also by its build quality, which is outstandingly good.

CONCLUSION

Interestingly enough, at the recent Melbourne Audio & AV show, a comment many of the visitors made to me was: 'they sure don't build them like they did in the old days'.

If you were one of those people, and you're reading this, you should take the time to audition the Aaron XX, because you'll be in for a very pleasant surprise, because this amplifier is built 'just like they did in the old days'. And if you're really, really lucky, Wicked Digital will still be offering the XX 'on special', because although it usually sells for \$3,299, at the time we were going to press it was being advertised on Wicked's website for just \$2,499. *—greg borrowman*



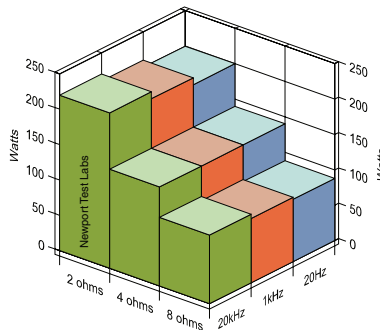
CONTINUED FROM PAGE 30

TEST RESULTS

The power output tests conducted by *Newport Test Labs* showed that the Aaron XX only just snuck across the finish line in terms of meeting its rated power output claims, and that's in spite of the mains power during the test being consistently higher than the nominal 240V supply (as you can see from the results, during the testing, the mains power varied between a low of 241V and a high of 258V). However, the Aaron certainly met its specifications, delivering exactly 80-watts (19dBw) per channel, both channels driven into 8 Ω , right across the audio band (20Hz to 20kHz). It also met its 4 Ω specification, delivering exactly 140-watts (21.4dBw) both channels driven, 20Hz–20kHz. Although the amplifier was able to deliver a little more than its rated power into 8 Ω when only one channel was driven (reaching a best of 97-watts at 20kHz), it couldn't manage this when driving a single channel into 4 Ω , where it delivered its rated power of 140-watts (21.4dBw) again. Power into 2 Ω loads was 180-watts (22.5dBw) per channel both-channel-driven and in excess of 200-watts per channel when only a single channel is driven. These figures are in the ballpark for what I'd expect given the Aaron XX's power supply components and the fact that it's using MJL3281A/1302A bipolar transistors made by On Semiconductor. These devices have been around since 2005 and have an established reputation for being rugged and reliable and in the Aaron XX, they're arranged in a common emitter fashion, rather than a common collector or emitter follower configuration. The circuit is d.c.-coupled with very low global feedback.

The ON devices are also wide-bandwidth, so I also wasn't surprised to read that *Newport Test Labs* measured the Aaron XX's bandwidth as extending from 2.6Hz to 100kHz –1dB and from 1.5Hz to 170kHz –3dB.

Across the audio band, the response was even flatter, as you can see from Graph 6, with the response 0.05dB down at 20Hz and 20kHz, for a 'normalised' response into a standard 8 Ω non-inductive resistor of 20Hz to 20kHz ± 0.0025 dB. Tested into a load that simulates that of a real loudspeaker, the Aaron's response was still excellent: 20Hz to 20kHz ± 0.025 dB. This uniformity predicts a low output impedance, which was confirmed by the lab's measurement of 0.02 Ω , resulting in a damping factor (at 1kHz) of 400—far in excess of requirements.



Power Output: Single and both channels driven into 8-ohm, 4-ohm and 2-ohm non-inductive loads at 20Hz, 1kHz and 20kHz. [Aaron XX Amplifier]

Channel balance was a good 0.12dB, which is more than required, but somewhat less than is achievable with today's technology. The same can be said of the channel separation figures measured by NTL—particularly that figure of 42dB at 20kHz. Interchannel phase, however, was excellent, with just the tiniest of discrepancies at 20Hz (0.03°) and 20kHz (0.07°).

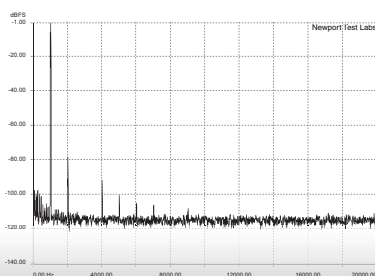
Signal-to-noise ratios were good, as you can see, with the unweighted and A-weighted figures coming in at 80dB and 85dB referenced to 1-watt output, and increasing to 91dB and 98dB when referenced to rated output (80-watts). If you look at the noise floors

on the distortion spectrograms, you can see that all the noise was basically low-frequency, and therefore power-supply related, because the noise floor between 100Hz and 20kHz was around 120dB down referenced to 1-watt output and –130dB referenced to rated output.

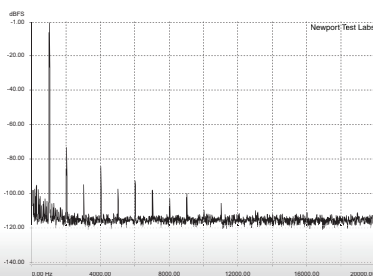
Speaking of distortion, harmonically-related distortion into an 8 Ω load (at an output of one watt) is shown in the spectrogram that is Graph 1. You can see a second harmonic at –80dB (0.01%) and a fourth a little more than –90dB down (0.003%). Fifth, sixth, seventh and ninth-order harmonics are clearly visible above the noise floor, but they're all more than 100dB down, so each contributes less than 0.001% THD. I did find it interesting that there's no third-order harmonic distortion at all. A third-order component did appear on the spectrogram showing distortion at the same output level into a 4 Ω load. This graph is also interesting because the even-order (good-sounding!) harmonic distortion components all increased in level. However, with the second harmonic component being the highest of these, at around –75dB (0.017%) and all others falling below –80dB, nothing would be audible.

At rated output, distortion increased considerably, as you can see in Graph 3 (80-watts into an 8 Ω load) and Graph 4 (140-watts into a 4 Ω load). As expected, distortion is slightly higher into the 4 Ω load, but, at least for the most significant harmonic distortion components, the harmonic 'signature' is very similar with regard to the relationships between the various harmonics. On both graphs, only the second-order, third-order and fourth-order harmonics were above –75dB (0.017%) and most of the higher-order distortion components were very close to, or below, –100dB (0.001%).

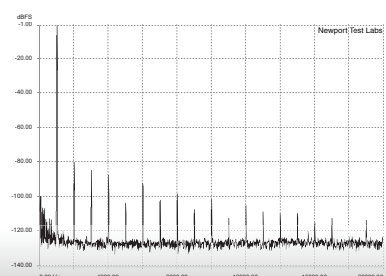
CCIF intermodulation distortion was low, as you can see from Graph 7. The two test



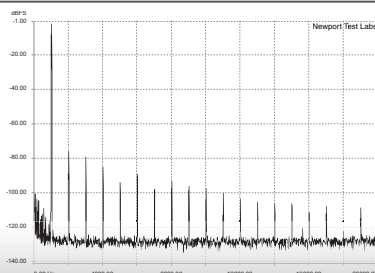
Graph 1: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across an 8-ohm non-inductive load. [Aaron XX 20th Anniversary Model]



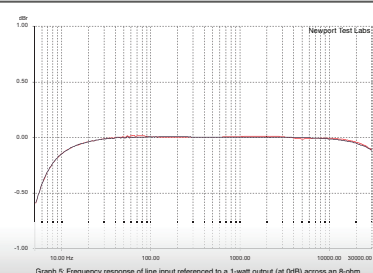
Graph 2: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across a 4-ohm non-inductive load. [Aaron XX 20th Anniversary Model]



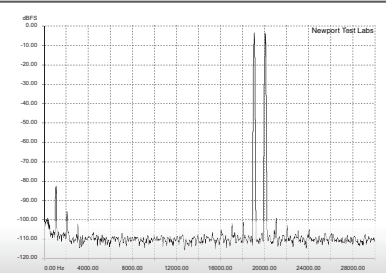
Graph 3: Total harmonic distortion (THD) at 1kHz referenced to rated output (80 watts) across an 8-ohm non-inductive load. [Aaron XX 20th Anniversary Model]



Graph 4: Total harmonic distortion (THD) at 1kHz referenced to rated output (140 watts) across a 4-ohm non-inductive load. [Aaron XX 20th Anniversary Model]



Graph 5: Frequency response of line input referenced to a 1-watt output (at 0dB) across an 8-ohm non-inductive load (Black Trace) and across a combination resistive/inductive/capacitive load representative of a typical two-way loudspeaker system (Red Trace). [Aaron XX 20th Anniversary]



Graph 6: Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz, referenced to a 1-watt output (at 0dB) across an 8-ohm non-inductive load. [Aaron XX 20th Anniversary]


signals are to the right of the middle of the graph, accompanied by unwanted sidebands at 16, 17, 18, 21, 22 and 23kHz. More significantly, there's a regenerated signal at 1kHz that's 84dB down, plus two other IMD products at 2kHz and 3kHz. Both of these, however, are more than 100dB down.

As regular readers will know, *Newport Test Labs* has started measuring heatsink temperature or, if the heatsinking is not easily accessible, the outer casing temperature. As the heatsink for the Aaron's output devices is inside the chassis, the temperature was measured on the casing immediately above the heatsink. After one hour running continuously with a 1-watt output, the temperature was a moderate 53.1°C. Under the same conditions, increasing output to 5-watts resulted in a temperature of a fairly high 71.2°C. Because of this, it would be wise to ensure the Aaron XX is adequately ventilated if you're mounting it inside a cabinet or enclosure of any sort.

■ A powerful amplifier that is more than happy to drive very low impedance loads

Power consumption was typical of a solid-state component when the Aaron XX was being used, with it drawing between 55 and 321-watts from the mains. Idling consumption was also typical, at 20-watts. However the stand-by consumption was quite high, at 18-watts, and some investigation revealed that switching the amplifier to standby only puts the pre-amplifier/display circuitry into standby: the remainder of the amplifier remains on, presumably to enable instant start-up. Although Aaron is not alone in arranging its standby circuitry in this fashion, I really don't think it's kosher to label such a mode as a 'standby' one.

The square waves reveal excellent performance. The 100Hz square wave has a little tilt betraying the limit of the amplifier's low-frequency response, but barely any curvature. The 1kHz square wave is very close to perfect, with only a close examination revealing the tiniest roll in the leading edge. The waveform at 10kHz is excellent. When driving a highly capacitive load, the Aaron performed very well, with only a very small overshoot and minimal ringing, demonstrating that the XX will be completely stable even into loudspeaker loads that are very low in impedance and also highly reactive.

Aaron's XX is a powerful amplifier that is more than happy to drive very low impedance loads, and has a super flat and very wide bandwidth combined with low distortion and low noise. Overall, an excellent amplifier!  **Steve Holding**

Aaron XX 20th Anniversary Amplifier - Power Output Tests

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	88	19.4	91	19.5	97	19.8
2	8 Ω	80	19.0	80	19.0	80	19.0
1	4 Ω	140	21.4	140	21.4	140	21.4
2	4 Ω	140	21.4	140	21.4	140	21.4
1	2 Ω	200	23.0	210	23.2	220	23.4
2	2 Ω	180	22.5	180	22.5	180	22.5

Note: Figures in the dBW column represent output level in decibels referred to one watt output.

Aaron XX 20th Anniversary Integrated Amplifier Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	2.6Hz – 100kHz	–1dB
Frequency Response @ 1 watt o/p	1.5Hz – 170kHz	–3dB
Channel Separation (dB)	61dB / 61dB / 42dB	(20Hz / 1kHz / 20kHz)
Channel Balance	0.12	dB @ 1kHz
Interchannel Phase	0.03 / 0.00 / 0.07	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.01% / 0.03%	@ 1-watt / @ rated output
IMD (CCIF)	0.007%	19kHz/20kHz 1:1
Signal-to-Noise (unweighted/weighted)	80dB / 85dB	dB referred to 1-watt output
Signal-to-Noise (unweighted/weighted)	91dB / 98dB	dB referred to rated output
Input Sensitivity (CD Input)	15mV / 216mV	(1-watt / rated output)
Output Impedance	0.02Ω	OC = 2.9397/2.9322V
Damping Factor	400	@1kHz
Power Consumption	18 / 20	watts (Standby / On)
Power Consumption	55 / 321	watts at 1-watt / at rated output
Mains Voltage Variation during Test	241 – 258	Minimum – Maximum
Heatsink Temperature (Degrees C)	53.1 / 71.2	@ 1-watt and 5-watts output



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