

JASON VICTOR SERINUS

Moon 891

STREAMING PREAMPLIFIER

No less than eight boxes, powered by six after-market power cables, comprise my current reference front-end.¹ As much as separate boxes can afford superior isolation and provide far more room for visionary engineers to work their magic, the advantages of a single box, which requires a single power cable and far fewer after-market interconnects, are obvious.

Enter Simaudio's Moon 891 network player/preamplifier (\$25,000).² Also called a "streaming preamplifier"—Simaudio frequently struggles with how to clearly and succinctly brand its Moon products—it includes a DAC that converts PCM and MQA files up to 32/384 (with 24-bit files upconverted to 32-bit) and DSD files up to 256. It also includes what Simaudio company co-owner Costa Koullisakis describes as "a fully configurable" MC/MM phono stage. Both theoretically and practically, it's an ideal solution for someone with space and/or budget constraints.

The 891 is also potentially a good match for the excellent Moon 861 stereo amplifier (\$22,000). (I reviewed a bridged pair of 861s last month and used them in this review.) Although the 891 has no internal storage, it can play files from streaming services, a directly-attached NAS, or a USB stick. The MiND 2 built into the 891



has a large buffer so caching of content is done during playback to address latency issues, dropouts, and other network instabilities. The buffer is automatically cleared when the 891 is turned off. Its brightness-controlled digital display, which can adapt to the lighting in the listening environment or be turned off completely during playback, is very up to date, with full-color album covers, titles, track names, and volume level visible to this audiophile from 12' away. (It also displays active input and the digital input's sample rate.) Adjustability includes two screen-saver styles, which can be

¹ The very thought of all those boxes and cables will surely drive more than a few of the frequent posters to our website apoplectic.

² See simaudio.com/en/product/891-network-player-preamplifier.

SPECIFICATIONS

Description One-piece network player/D/A processor/analog preamplifier with phono stage, BRM-1 intelligent remote control, and built-in Moon damping base. Integration: Roon Ready, Apple AirPlay, Spotify Connect, Tidal Connect, local media servers. Streaming services: Qobuz, HighRes Audio, Deezer, and Tidal. Digital inputs: HDMI with ARC for TV, AES3, S/PDIF (2), optical (Tos-Link) (2); USB Audio, USB (type-A) host, network/RJ45 (2). DAC decodes PCM and MQA up to 32/384, upconverting 24-bit to

32-bit, and DSD up to DSD256. Analog inputs: two pairs line RCA (single-ended), one of which can be used as a phono input, 1 pair line XLR (balanced). 12V trigger input. Analog outputs: 1 pair RCA (single-ended), 1 pair XLR (balanced). Connectors for Moon 820S external power supply. Analog input impedance: 22k ohms. Maximum gain (line inputs): 13.5dB. Phono input gain: 40, 45, 60, and 66dB. Phono input capacitance: 0/100pF/470pF. Phono input impedance: 10 ohms, 100 ohms, 1k ohm, 47k

ohms. Output impedance: 50 ohms. Frequency response: 2Hz–200kHz, +0dB/–3dB. Crosstalk: –125dB. S/N ratio (preamplifier): 125dB. Dynamic range (digital input, fixed output): 125dB. THD+N: 0.0003%. IMD: 0.00006%. Power consumption (idle): 25W. Power consumption (full power standby): 22W. Power consumption (low power standby): 5W.

Dimensions 18.95" (481mm) W x 5.53" (140mm) H x 17.66" (449mm) D. Weight: 49lb (22kg). Shipping weight: 54lb (25kg).

Finish Two-tone silver/black.

Serial numbers of units reviewed 310A22426042 (auditioning), 310A22426340 (measuring). Manufactured in Canada.

Price \$25,000. Approximate number of dealers: 59 US, 97 North America. Warranty: 10 years, parts & labor (with registration).

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disabled. Firmware updates are easily downloaded and installed from the internet.

The 891 utilizes a uniquely designed remote control, and plays files via phone or pad using the downloadable MiND (Moon Intelligent Network Device) Controller app, which is available for both Android and iOS. To quote the online manual, the app “enables users to stream music from several online services and local network servers, update Moon products automatically, and synchronize playback across devices in multiple Zones simultaneously.” It also allows you to create playlists, toggle to and from “standby,” switch inputs, and smoothly adjust volume.

Because my system is all-digital—I have no room for a turntable, phono preamplifier, a ton and a half of LPs, and a record cleaner—this review focuses solely on the 891’s performance with digital input data. Another reviewer will assess its phono preamp in a Follow-Up.

Diving deeper

In a long email, Koulisakis laid out the rationale behind Moon’s North Collection. In edited form, he wrote, “When we set out to design the new top-level Moon Collection which includes the 891 and 861, we came to the realization . . . that combining components in one chassis had the likely potential to surpass the performance of comparable separates. We do, however, continue to believe that the finest performance possible, without cost constraints, still comes from separates. That is why we continue to make our 850P, which remains our finest-ever all-analog preamplifier.

“We also suspected that putting our new finest DAC in the same chassis as the analog preamplifier would yield better results than if we put them in separate boxes. The performance of the 891’s preamplifier section is indeed very, very close to the 850P’s. However,

since the new 800-level quality DAC built into the 891 considerably surpasses the quality of our previous flagship, the 780D v2, the 891’s DAC/preamp section does indeed surpass the performance of the 780D v2/850P combination.

“Once the complexities of combining separate functions in one chassis are overcome, the design transcends the limitations of connecting cables and outweighs the penalties of keeping them separate.

“The 891 represents an intricate and sophisticated fusion of analog and digital that is simply not yet possible with separate boxes. Technological advances now allow us to combine multiple components in one box in a way that greatly reduces the limitations caused by proximity to the point where the benefits surpass the penalties. We feel that this holds true at these price levels and will likely hold true at even higher price levels over time.”

The 891’s MDE-3 DAC architecture, which surpasses the MDE-2 and MDE-1 variants in lower-level Moon components, consists of an FPGA (field programmable gate array), which handles digital input data and clocking. Sayeth Koulisakis, “Timing errors are reduced below the threshold of audibility to the femto-second range (which is 10⁻¹⁵ power, or a quadrillionth of a second), resulting in superior image focus and detail. Furthermore, each channel uses an eight-channel, 32-bit DAC, with the DAC’s eight outputs summed, in a fully balanced configuration per channel. This process is claimed to minimize minute variations between individual DACs and provides a consistent analog signal with less overall distortion and improved inter-channel matching. That translates into better sound clarity. Finally, the DACs themselves are the ESS 9038Pro.”

Moon’s latest damping technology, the MDB (Moon Damping Base), mounts the analog board on an internal platform that completely disconnects it from the chassis. The audio board is



also mounted on a heavy, thermally damped isolation pad that, in Koulisakis's words, "promotes isothermal behavior during heat dissipation that improves inter-channel matching, clarity, focus and accurate harmonics." The MDB includes a special recessed rear panel, also decoupled from the outer chassis, that houses all analog connections. Together, these features are claimed to greatly reduce the unwanted microphonics and related distortions caused by parasitic vibration.

The improved M-Ray2 volume control, an evolved version of the volume control in the flagship 850P, employs 620 fully discrete separate volume settings in steps as fine as 0.1dB, and operates solely in the analog domain. You can change the steps from 0.1dB to 0.5dB in the 891's settings. When you turn the knob fast, increments increase from 0.1 or 0.5dB to a full 1.0dB.

Koulisakis noted that, compared to a mechanical potentiometer, the M-Ray2 volume control is quieter and more precise, with no significant crosstalk and "extremely tight tolerances" between left and right channels. "The volume control has always been a major source of coloration in preamplifiers, which is why we have been using our own electronically controlled fully analog volume control since 1995," he wrote. "The 891 contains the finest volume control system we have ever designed."

The 891's unique remote control communicates via Bluetooth and responds "almost instantly" to changes made on the front panel. It allows you to turn the unit on and off as well as control volume, switch inputs, and adjust balance. The angle of its face purportedly makes it easy to use without lifting it from a tabletop.

Without a table in the music room to test this claim, I welcome others to make that call.

Finally, there's the phono section. In addition to basic preset cartridge configurations—the MM mode's is 40dB gain, 47k ohms impedance, and 100pF capacitance, while the MC's is 60dB gain, 100 ohms impedance, and 0pF capacitance—the 891 includes a configurable phono stage whose "advanced mode" permits custom values for gain, impedance, capacitance, and EQ curves (RIAA and IEC). There's also a ground terminal for tonearm grounding. For more on the phono preamp, please see the forthcoming follow-up.

The unit's analog outputs—one pair single-ended and one pair balanced—can be independently set to either "Variable" (for connecting to power amplifiers, subwoofers, and active loudspeakers) or "Fixed" (for headphone amplifiers and other devices with integrated volume controls). The MiND controller app enables you to join multiple MiND zones together to play audio as a cohesive system in multiple rooms simultaneously. Finally, MoonLink technology can trigger automated behavior in multiple Moon devices.

Looking it over

Kudos to Simaudio for the 891's well-composed online manual³ and accompanying literature. Minus kudos for the 891's packaging, whose collapsible nature requires two people to hold it together when you pack the baby up. If your unit ever needs servicing, ask your dealer to help send it off or draft your significant other

³ See simaudio.com/wp-content/uploads/2023/05/20240506-User-Manual-891-En.pdf.

MEASUREMENTS

I performed a full set of measurements on the Moon 891 using my Audio Precision SYS2722 system,¹ repeating some of the testing with the magazine's higher-performance APx555 analyzer. For logistic reasons, I measured a different sample from that reviewed by JVS; mine had the serial number 310A22426340. Before I lifted the Moon onto the test bench, I unfastened the three transit bolts on its base—a good thing I read the startup guide before starting the testing! I installed Moon's MiND app on my iPad mini, which allows the 891's volume to be controlled but doesn't allow settings to be adjusted.

As JVS only auditioned the Moon 891's digital inputs in his review—I understand that another reviewer will be reporting on the sound of the 891 as an analog preamplifier in a follow-up—I looked first at the performance of the Moon's DAC. I used the AES3 and coaxial and optical S/PDIF inputs, all of which accepted data sampled at rates up to 192kHz, as well as USB data sourced from my MacBook Pro. Apple's USB Prober utility identified the Moon as "USB HD Audio" from "MOON," with the serial number string "2 (None)," and indicated that the USB port operated in the optimal isochronous asynchronous mode. The AudioMIDI utility revealed that the 891 accepts 16-bit

and 24-bit integer data via USB sampled at all rates from 44.1kHz to 768kHz.

The Moon's digital inputs preserved absolute polarity from the balanced and unbalanced outputs. As set up out of the box, the volume control operated in accurate 0.5dB steps. (Smaller, 0.1dB steps can be selected with the front-panel Set-Up button and menu.) With the control set to the maximum of "80," the Moon 891's output level with a full-scale 1kHz tone was 6.52V at both output types. Switching the output levels to "Fixed," the maximum levels were 2.13V. As the maximum voltage in variable mode is well below the level

where the output stages clip (see later), the Moon 891's DAC offers a well-managed gain architecture.

Fig.1 shows the Moon 891's impulse response with USB data sampled at 44.1kHz. The filter is a minimum-phase type with all the ringing following the single sample at 0dBFS. The magenta and red traces in fig.2 show the filter's ultrasonic rolloff with 44.1kHz white noise data at -4dBFS. They reach full stop-band attenuation just above half the sample rate (this indicated by the vertical green line), with the aliased image

¹ See stereophile.com/content/measurements-maps-precision.

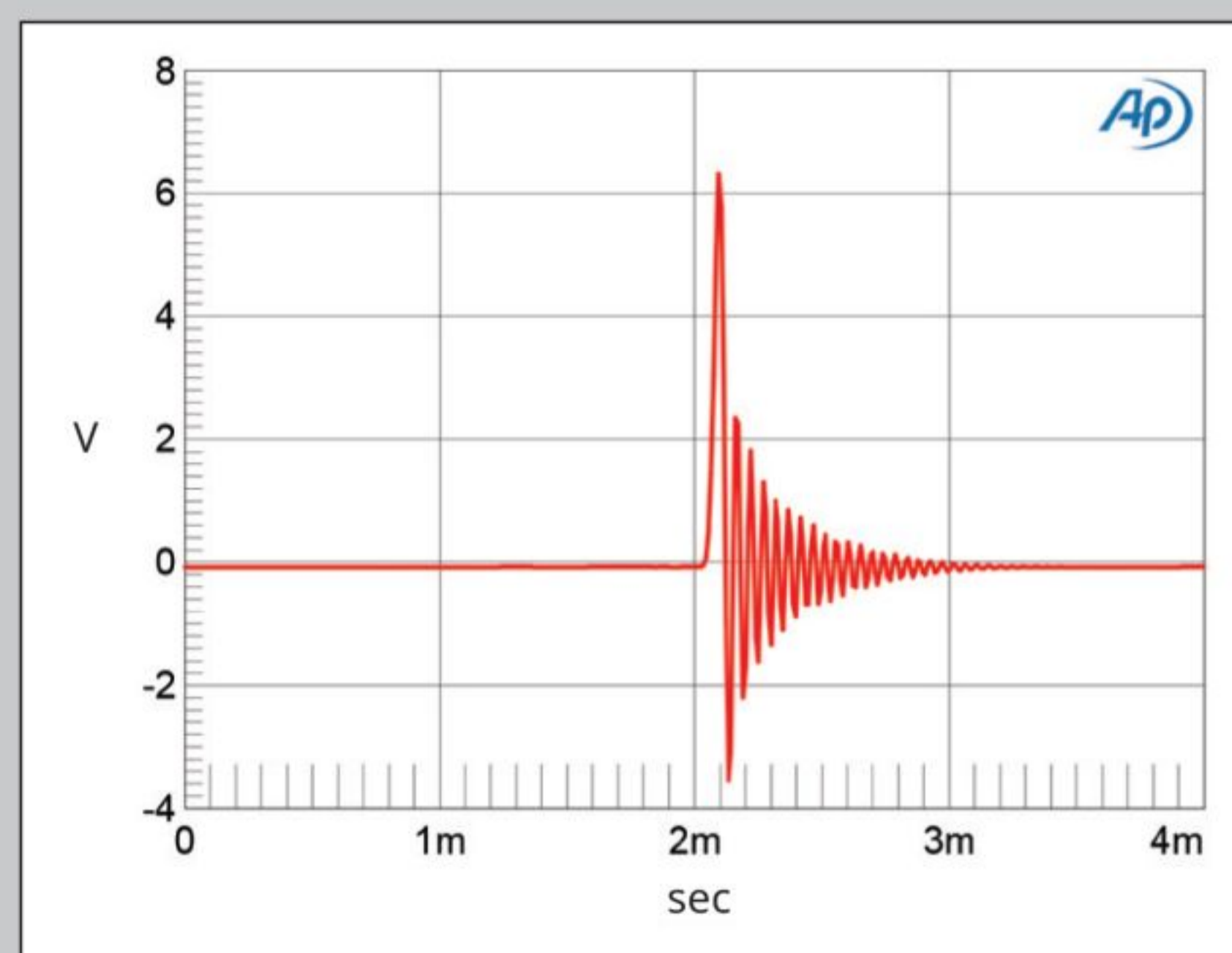


Fig.1 Moon 891, digital inputs, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

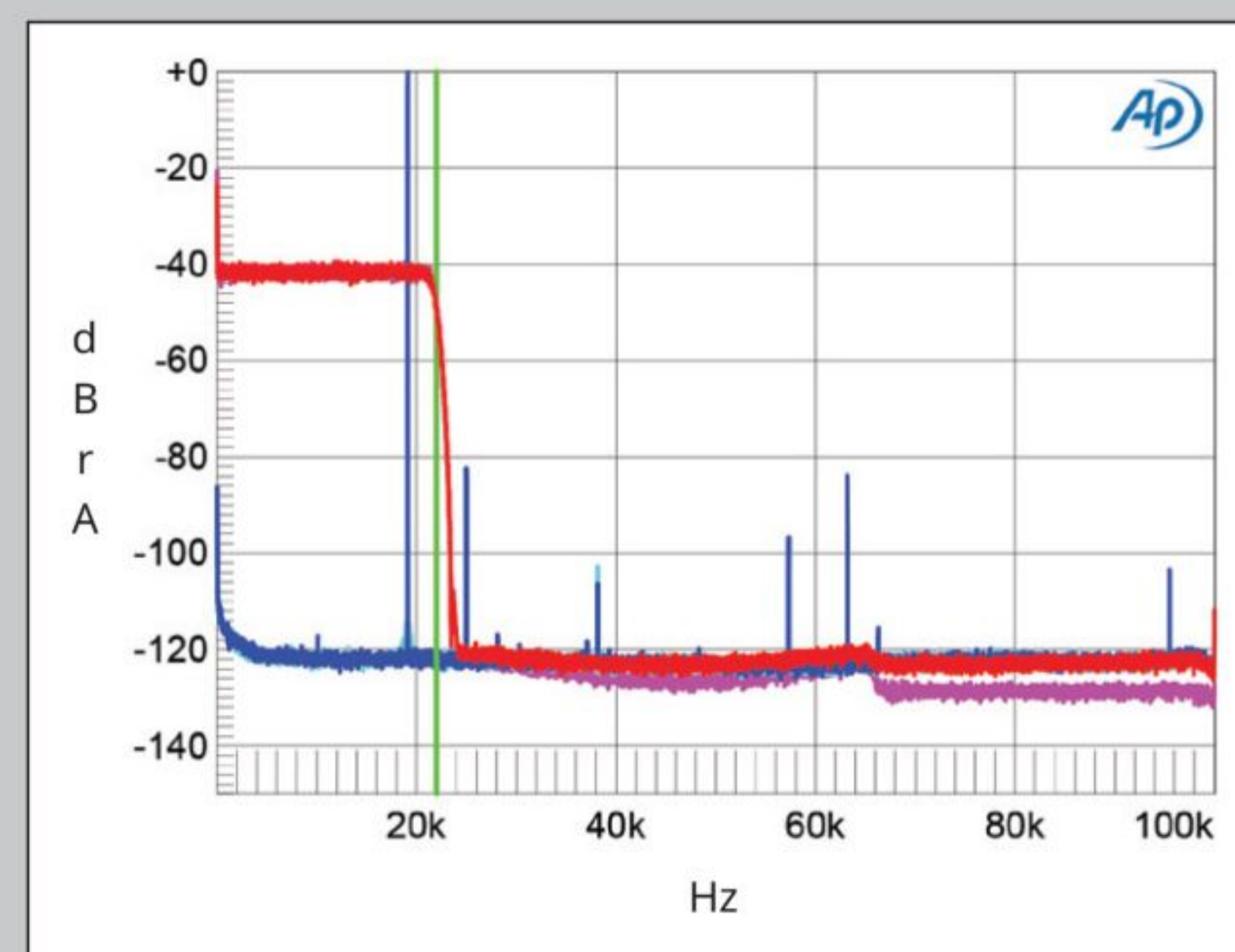


Fig.2 Moon 891, digital inputs, wideband spectrum of white noise at -4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan) into 100k ohms with data sampled at 44.1kHz (20dB/vertical div.).

or anyone else you can snare. (Just ask my neighbors about that one.) Unless you love to frustrate yourself and curse loudly, that is.

As someone more averse to regurgitation than cursing, I'll go light on front and back panel contents that are easily assessed online. Besides the display, the attractive two-toned front panel includes a large, smooth-turning volume control and far smaller standby, mute, input, and setup buttons. Their positioning to the left and right of the display is devoid of political connotations. The rear panel's two antennas, six digital inputs (ARC HDMI, AES3, two S/PDIF, and two TosLink optical), 12V trigger out, USB audio, USB host, and two RJ45 network ports are intelligently spaced on the top half of the panel. Below them are the ground terminal, two pairs of single-ended analog inputs, one of which can be used either for line-level signals or phono cartridge outputs and one balanced pair; single



pairs of XLR and RCA analog outputs, two ports for Moon's 820S external power supply⁴ (\$8500—I did not receive one for evaluation), a 50–60Hz three-pronged 15amp IEC inlet, and a power switch.

⁴ "It did not occur to me to send you an 820S," Koulisakis wrote after the fact. "The 820S will automatically bypass the 891's built-in MHP supply and provide a blacker background, increased dynamics, and better recovery of the detail responsible for the air and space around instruments. It is not a massive upgrade, but rather a subtle one. The 820S, which can power two units simultaneously, comes with four special 1.5m low-impedance cables; custom lengths are available."

measurements, continued

at 25kHz of a full-scale tone at 19.1kHz (cyan, blue) suppressed by >80dB. The frequency response with 44.1kHz, 96kHz, and 192kHz data (fig.3) is flat in the audioband, with a sharp rolloff just below half of each sample rate.

The red trace in fig.4 plots the error in the analog output level as a 24-bit, 1kHz digital tone stepped down from 0dBFS to -140dBFS. Even at the lowest level, the amplitude error is <0.5dB, which implies superbly high resolution. An increase in bit depth from 16 to 24, with dithered data representing a 1kHz tone at -90dBFS, dropped the Moon 891's noise floor by 30dB (fig.5). This implies a measured resolution of 22 bits. With undithered data representing a tone at exactly -90.31dBFS, the waveform was symmetrical, with negligible DC offset, and the three DC voltage levels described by the data were clearly defined (fig.6). With undithered 24-bit data, the Moon 891 output a superbly clean sine wave (fig.7).

The Moon's digital inputs produced very low levels of distortion. The second and third harmonics are the highest in level (fig.8), but at close to -120dB (0.0001%) are negligible. Intermodulation distortion with 24-bit data representing an equal mix of 19 and 20kHz tones, each at -6dBFS, was also very low (fig.9).

Fig.10 shows the spectrum of the Moon 891's output when it was fed 16-bit J-Test data via TosLink. All the odd-order harmonics of the undithered low-frequency, LSB-level squarewave lie at the correct levels, and the central spike that represents the

high-level tone at one-quarter the sample rate is appropriately narrow. Repeating this analysis with 24-bit J-Test data via both TosLink and USB gave a superbly low noise floor (fig.11).

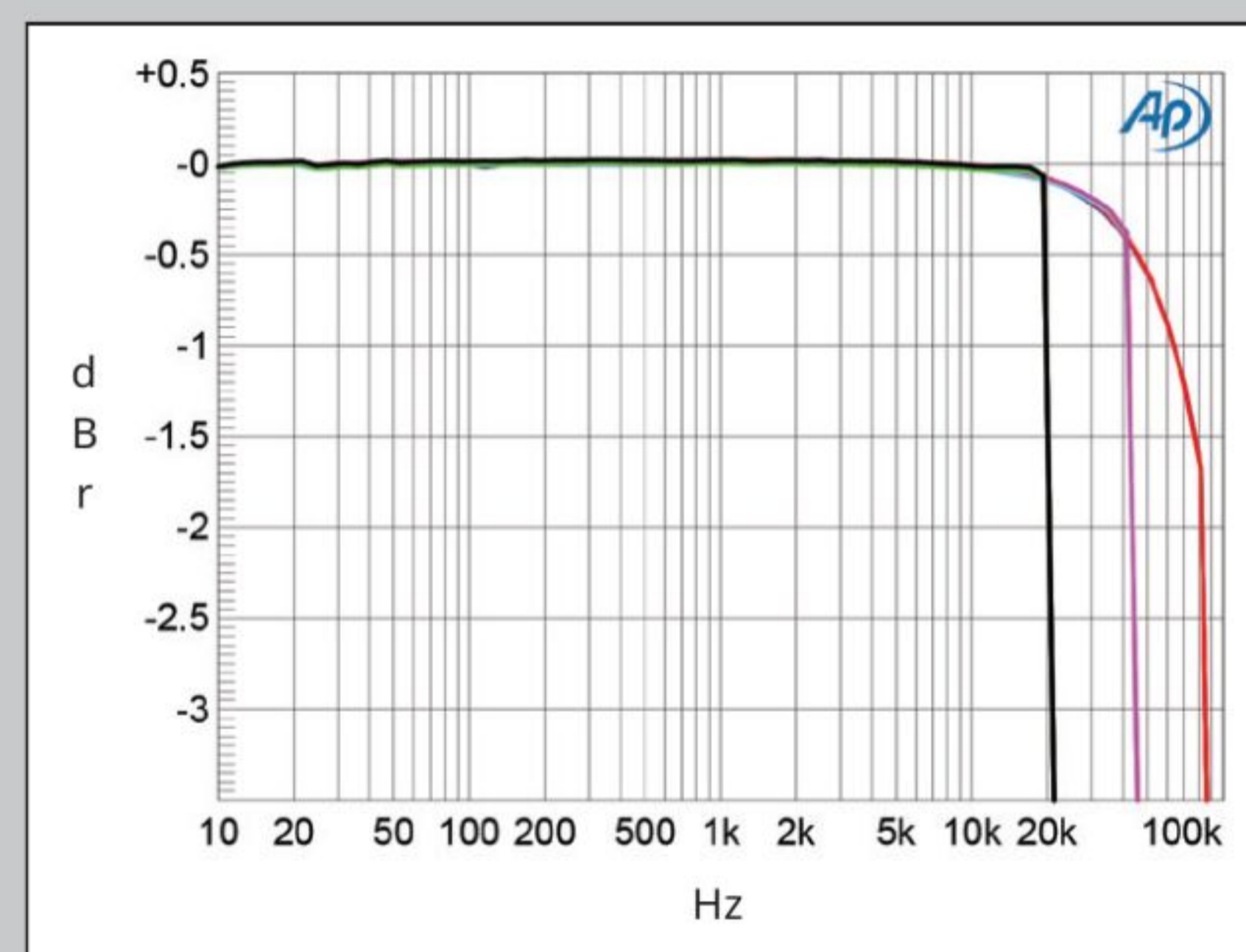


Fig.3 Moon 891, digital inputs, frequency response at -12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), and 192kHz (left blue, right red) (1dB/vertical div.).

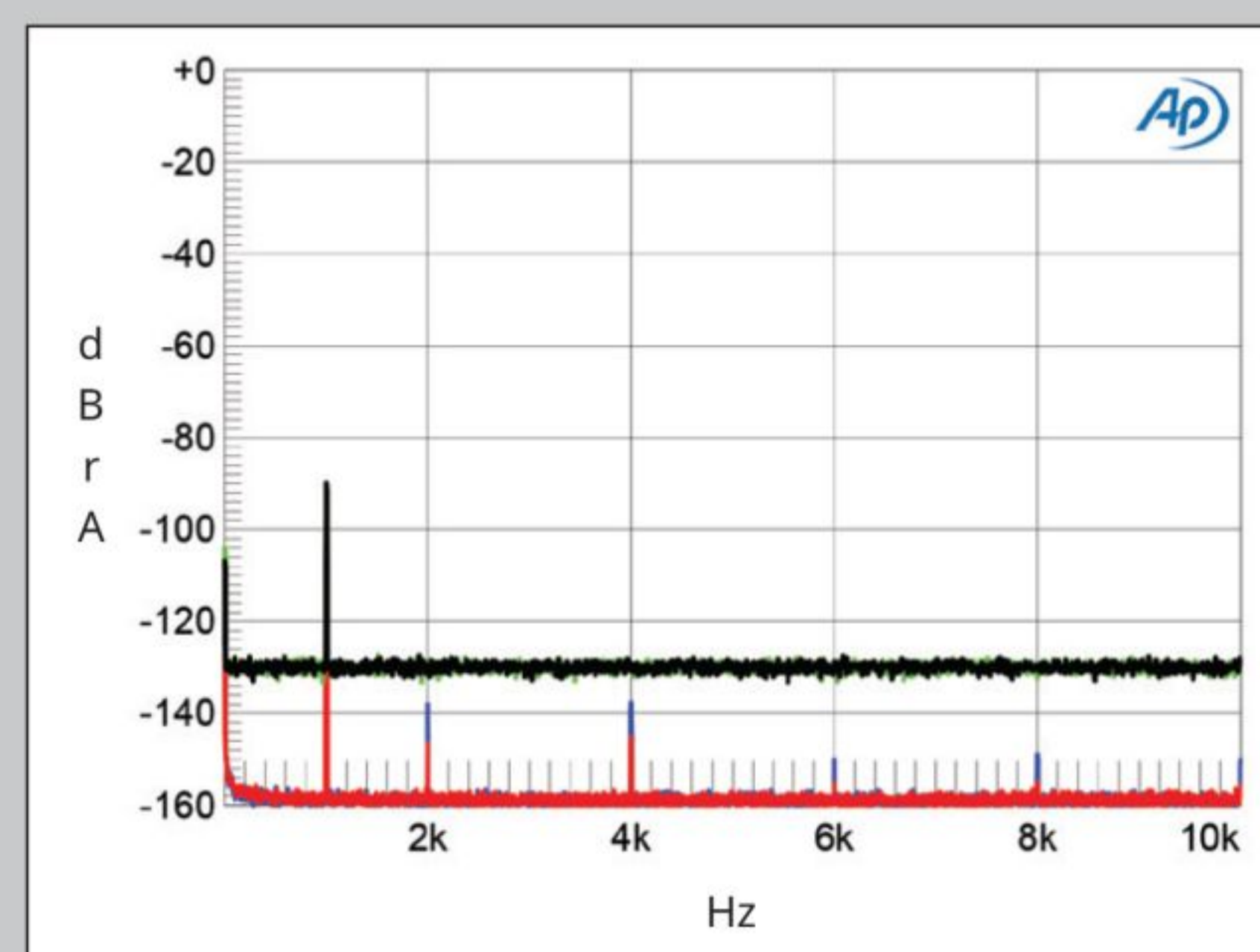


Fig.5 Moon 891, digital inputs, spectrum with noise and spurs of dithered 1kHz tone at -90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

With the Moon 891's balanced and single-ended line inputs, the preamplifier preserved absolute polarity at the balanced and unbalanced outputs. With the volume control set to the maximum, the

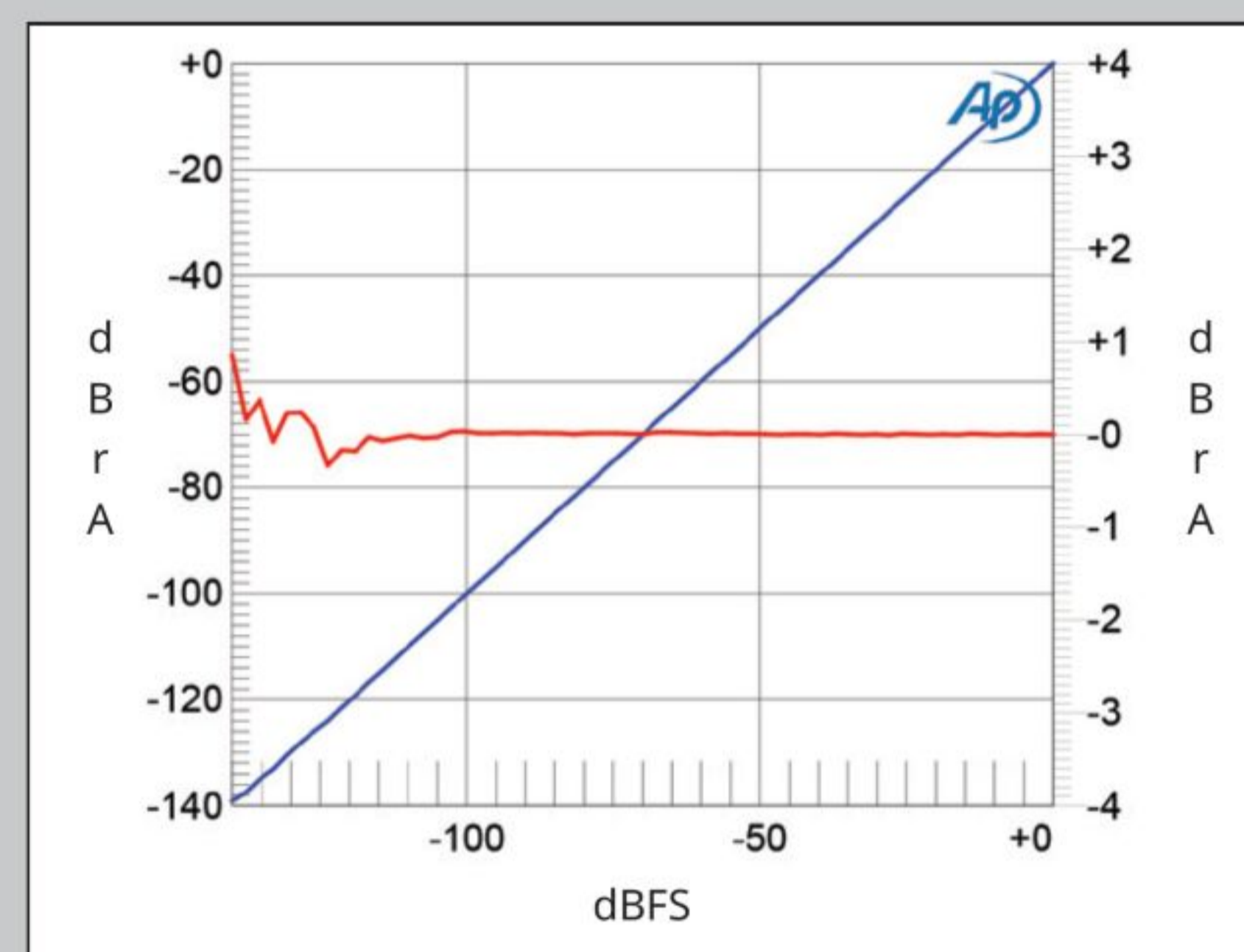


Fig.4 Moon 891, digital inputs, left channel, 1kHz output level vs 24-bit data level in dBFS (blue, 20dB/vertical div.); linearity error (red, 2dB/small vertical div.).

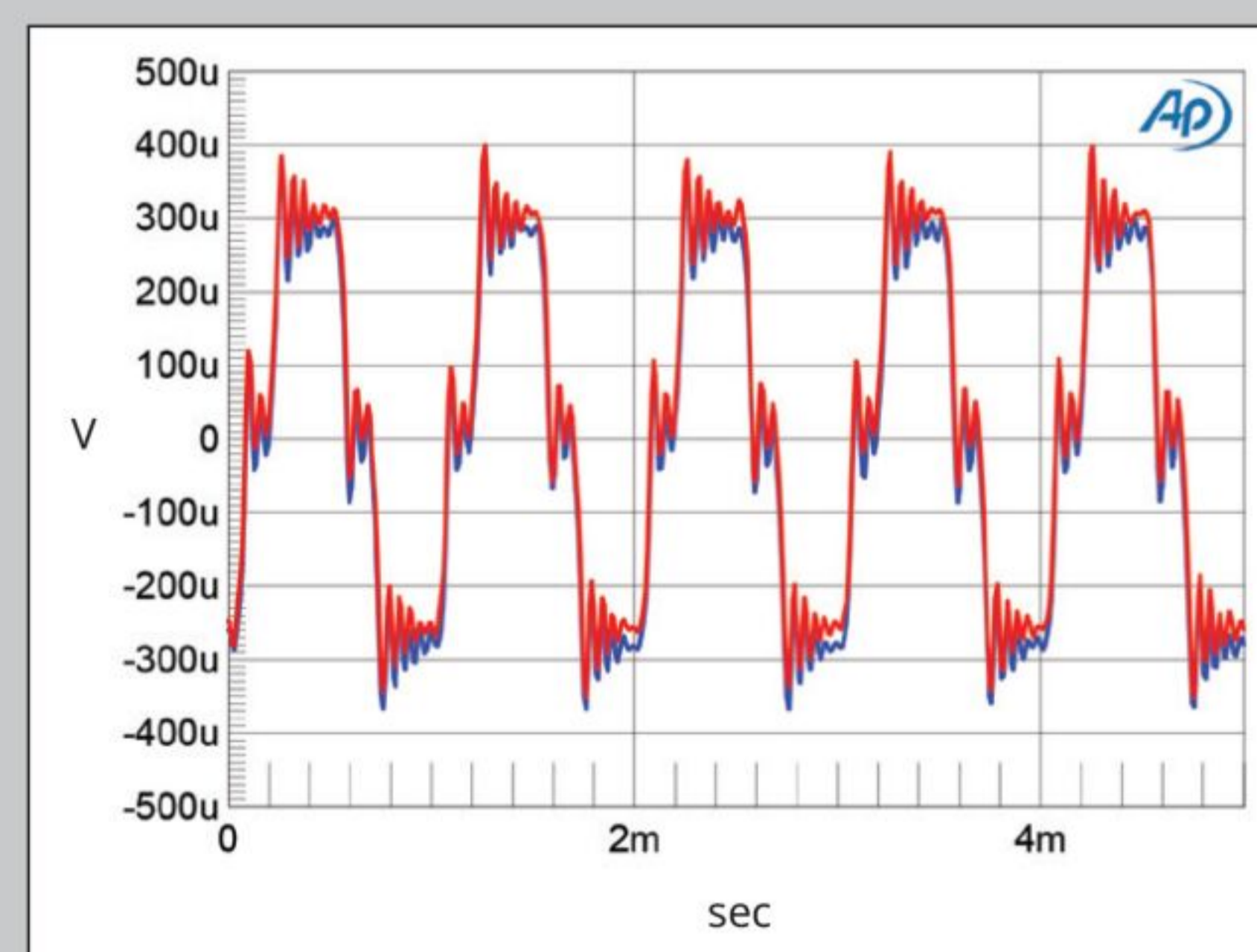


Fig.6 Moon 891, digital inputs, waveform of undithered 1kHz sine wave at -90.31dBFS, 16-bit data (left channel blue, right red).

Once you remove and store the three bolts that unlock the internal isolation platform, read the manual, or learn what to do from your dealer, break the unit in for a good 100 hours, and feed the animals, you're more or less ready to go.

Moving forward

Setup was simple: hoist the not-really-heavy Moon 891 network player/preamplifier onto one of the top shelves of my Grand Prix Monza double rack; set it atop three Wilson Audio Pedestals; connect Ethernet, balanced interconnects, and power cable; flip the rear power switch; depress the front panel's standby button; and enjoy the front panel's short welcome greeting.

First up: Evaluate the 891 on its own. Make a mental note to compare the sound of music streamed from Qobuz or Tidal to the same files played from an attached USB/SSD stick. Also, be sure to evaluate the sound of the same track streamed with the MiND app and with Roon. Finally, be careful not to get so caught up in how enjoyable the sound is that I end up forgetting about all the sonic tests I can possibly perform. As you'll soon read, the last one was the greatest challenge.

Before proceeding, I asked Koulisakis which file source—a streaming service or USB stick—would sound superior. He replied, "Network playback via Qobuz or Tidal should be better. The problem with a USB stick is that it is designed as a convenience solution. There is minimal buffering, unlike the state-of-the-art servers which host Q or T. In addition, the USB stick user interface requires traditional file browsing (even though you are using the MiND app), as opposed to the much more enjoyable experience of a DLNA server which sorts and displays the music by utilizing all the handy metadata embedded in the music file (album artwork, title, artist, etc.)."

I also asked if it would be possible to separately evaluate the 891's DAC and analog sections, and if it made sense to do so. He replied, "It would not be a fair test. Given the complex and synergistic integration of these two major components of the 891, even if you set the outputs of the 891 to fixed, you cannot completely eliminate the preamplifier. The reverse also holds true for its analog preamplifier section, but to a lesser extent."

Nonetheless, one external component justified comparison. Rather than using the 891's internal streamer, which uses Moon's MiND control app, it was easy to change a few cables, bypass it, and stream audio data from my reference Innuos Statement Next-Gen music server with 4TB SSD internal storage (\$26,200), fed by the Innuos PhoenixNet reclocking network switch (\$4349) and controlled by the Innuos Sense app. Yes, this streaming/server combo costs more than the Moon 891 itself—far more than double the price if you add in the price of an additional top-line aftermarket power cable, Ethernet cable, and USB cable. But I could not resist learning the degree to which an external server would improve the 891's performance. Bypassing its streamer would also enable me to better evaluate the quality of its DAC/preamp section.

On with the show

As a subscriber to the two main British recording review rags, *Gramophone* and *BBC Music Magazine*, I was surprised to discover how many Editor's Choice commendations *Gramophone* has published for recent recordings of Benjamin Britten's early Violin Concerto. Since I couldn't imagine that any violinist could possibly top Isabelle Faust's astounding live recording with the Symphonieorchester des Bayerischen Rundfunks (Bavarian Radio Symphony Orchestra) under Jakub Hrůša (24/96 FLAC, Harmonia Mundi/Qobuz)—a performance in which subtlety, virtuosity, tonal



beauty, and emotional import carry equal weight, and which I seem not to have reviewed solely because I've reviewed so many of Faust's other superb recordings over the past few years—I was gratified to discover that it earned *Gramophone's* Concerto Recording of the Year Award.

Before those awards were announced, I decided to start my listening with this recording because, in addition to the music's compelling beauty and message, it's an excellent test of sonic accuracy. With the Moon 891 feeding my reference D'Agostino Momentum M400 MxV monoblocks, the sound was quite full, with requisite sweetness and bite. The sound, which poured forth effortlessly, pulled me in and compelled me to listen deeper.

"I want to listen to every note," I wrote. Dynamics and bass weren't as impressive as I expect with my far more expensive eight-piece reference front-end, but who would reasonably expect them to be?

Alas, in the MiND app, I couldn't find a way to locate the liner notes that accompany many Qobuz titles. Even though I could simultaneously open the Qobuz app and read them there, the extra step was time consuming and, to those addicted to instant gratifica-

tion, a bit annoying.

Balancing that out, MiND's search function worked extremely well. When I entered "Britten Violin Concerto Faust" in the MiND app's search function and looked for results under "album," Faust's recording immediately popped up in 24/96 FLAC on Qobuz or Tidal. (The Innuos search engine works equally well.) I could only search one service at a time (unless I used Roon—more on this below), but the MiND search engine located albums, tracks, artists, and more with an ease that escapes the search engines of some high-priced music servers.

At this point, I tried attaching a wire from a Nordost QKore 6 grounding unit to the 891's spare Ethernet port. After it widened the soundstage, rendering it more three-dimensional and transparent while maintaining the smoothness I'd already lauded, I resolved to continue using the QKore 6 with my reference system once the review ended. Then, I decided to switch amplifiers to the Accuphase A-300 monoblocks because I'm forever eager to explore sonic compatibilities, differences, and similarities. Curiosity may have killed more than one cat, but my feline nature remains such a recessive trait that, to this day, I have yet to crawl inside a paper

measurements, continued

voltage gain at 1kHz was 9.75dB from the balanced output with both balanced and unbalanced inputs, and 9.66dB from both output types with an unbalanced input. (These gains are lower than the specified 13.5dB.) Setting the output level to "Fixed," the gain from both output types was 0dB, ie, unity gain.

The line input impedance is specified as 22k ohms. The single-ended impedance was 11k ohms at 20Hz and 1kHz and 6.2k ohms at 20kHz, and the balanced input impedance was 44k ohms at 20Hz and 1kHz, 23k ohms at 20kHz. The single-ended output impedance was the specified 50 ohms across the audioband; the balanced output impedance was 96 ohms, again at all audio frequencies. The line frequency response was flat up to 30kHz into 100k ohms and 600 ohms (fig.12), gently rolling off above that frequency to reach -3dB at 200kHz, as specified. The very close channel balance and the overall response were preserved at lower settings of the volume control.

Channel separation was superbly high, at >130dB in both directions below 2kHz and still 110dB at the top of the audioband. The wideband, unweighted signal/noise ratio, taken with either the balanced or unbalanced inputs shorted to ground and the volume control set to its maximum, was a superb 99.3dB ref. 2V in both channels. This ratio improved to 113.2dB when the measurement bandwidth was restricted to the audioband, and to 116dB when A-weighted. Fig.13 shows the spectrum of the Moon 891's balanced low-frequency noise floor at 2V with the volume control set to its maximum. The level of random

noise is extremely low, and there are no power supply-related spurious visible in this graph.

Fig.14 plots how the THD+noise percentage in the Moon 891's balanced output varies with output voltage into 100k ohms.

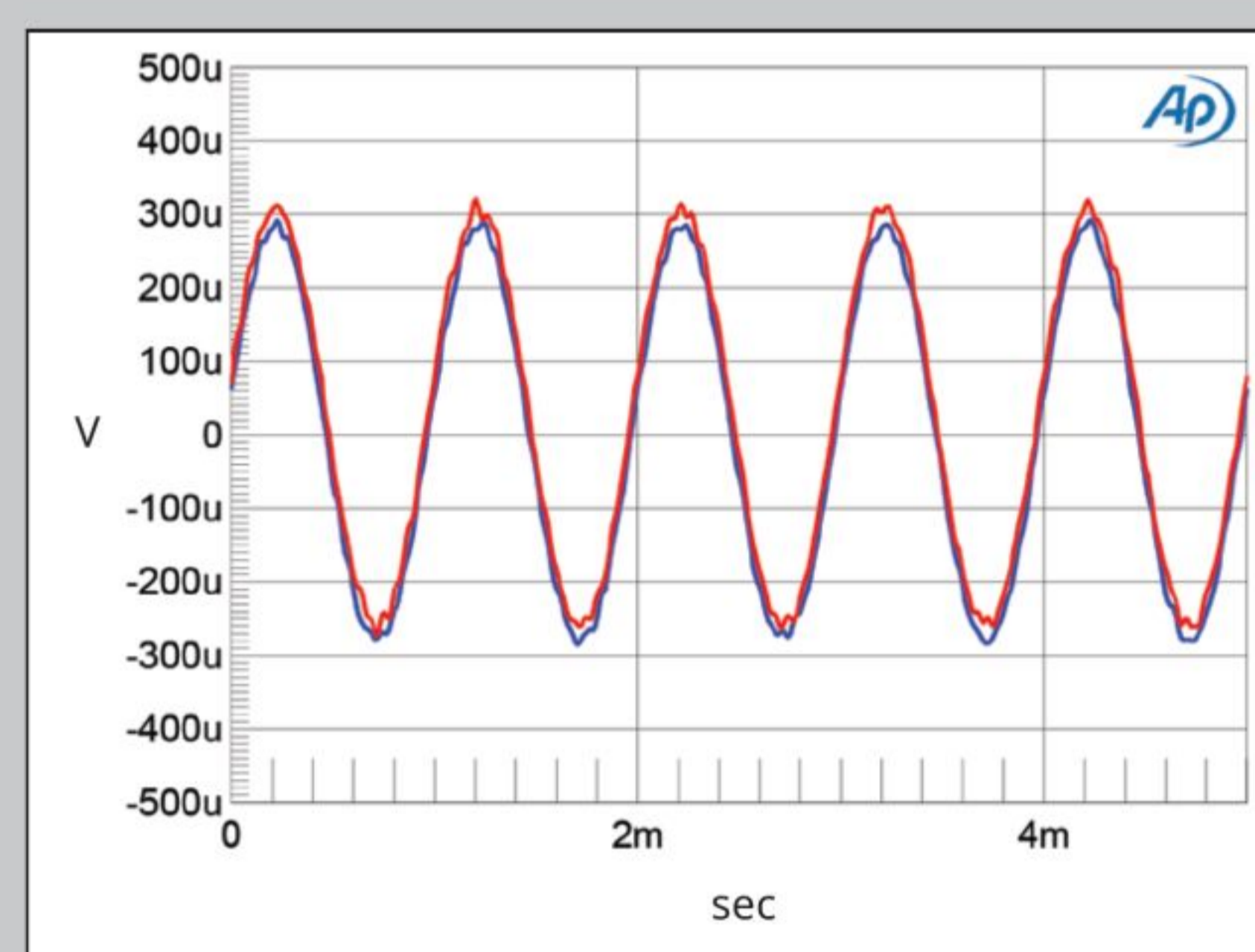


Fig.7 Moon 891, digital inputs, waveform of undithered 1kHz sinewave at -90.31dBFS, 24-bit data (left channel blue, right red).

The downward slope of the traces indicates that the distortion lies below the noise up to 4V. Our usual definition of clipping is when the THD+N reaches 1%; however, the Moon's balanced output seemed to be limited to 12.1V, when the THD was 0.045%.

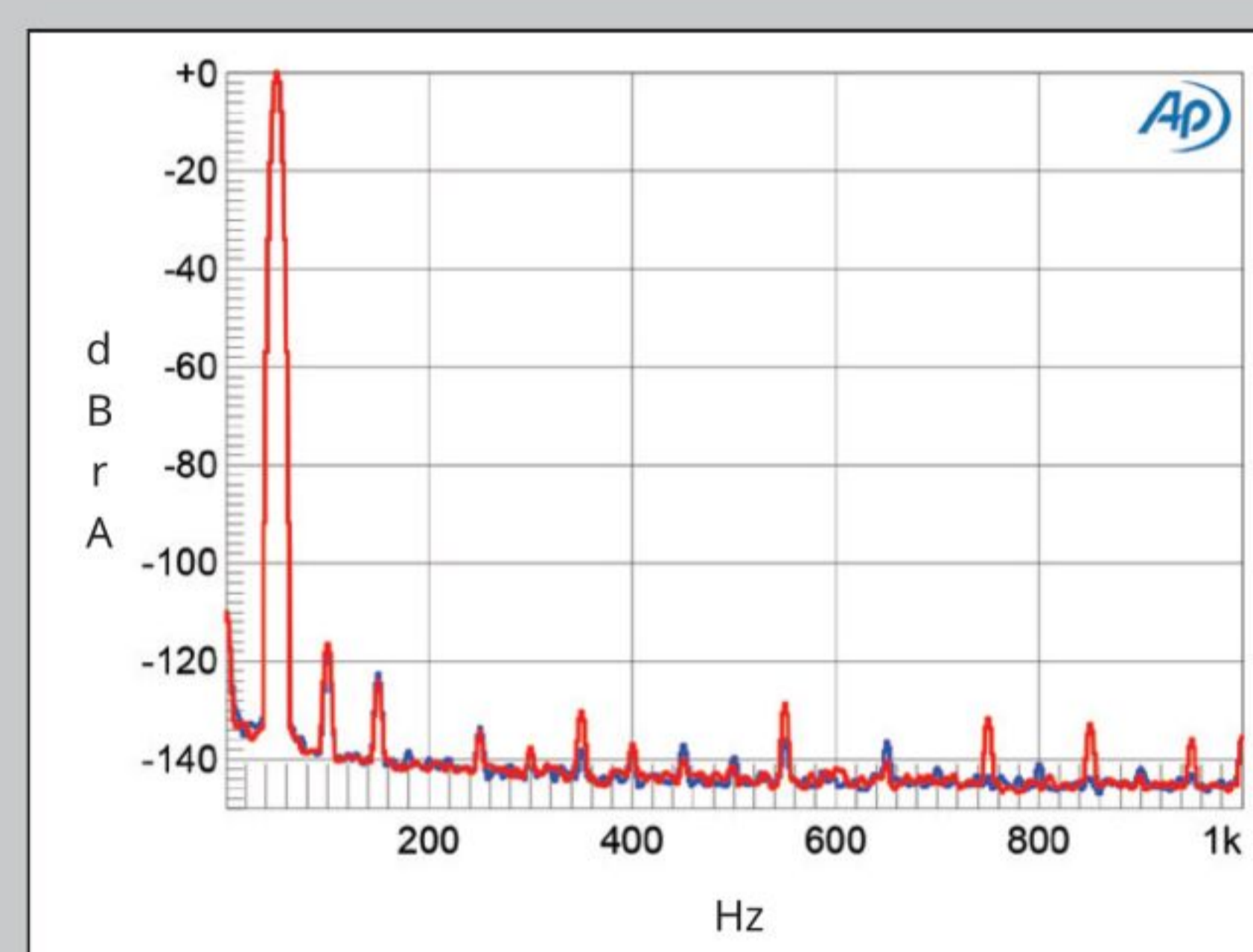


Fig.8 Moon 891, digital inputs, balanced output, spectrum of 50Hz sinewave, DC-1kHz, at 0dBFS into 100k ohms (left channel blue, right red, linear frequency scale).

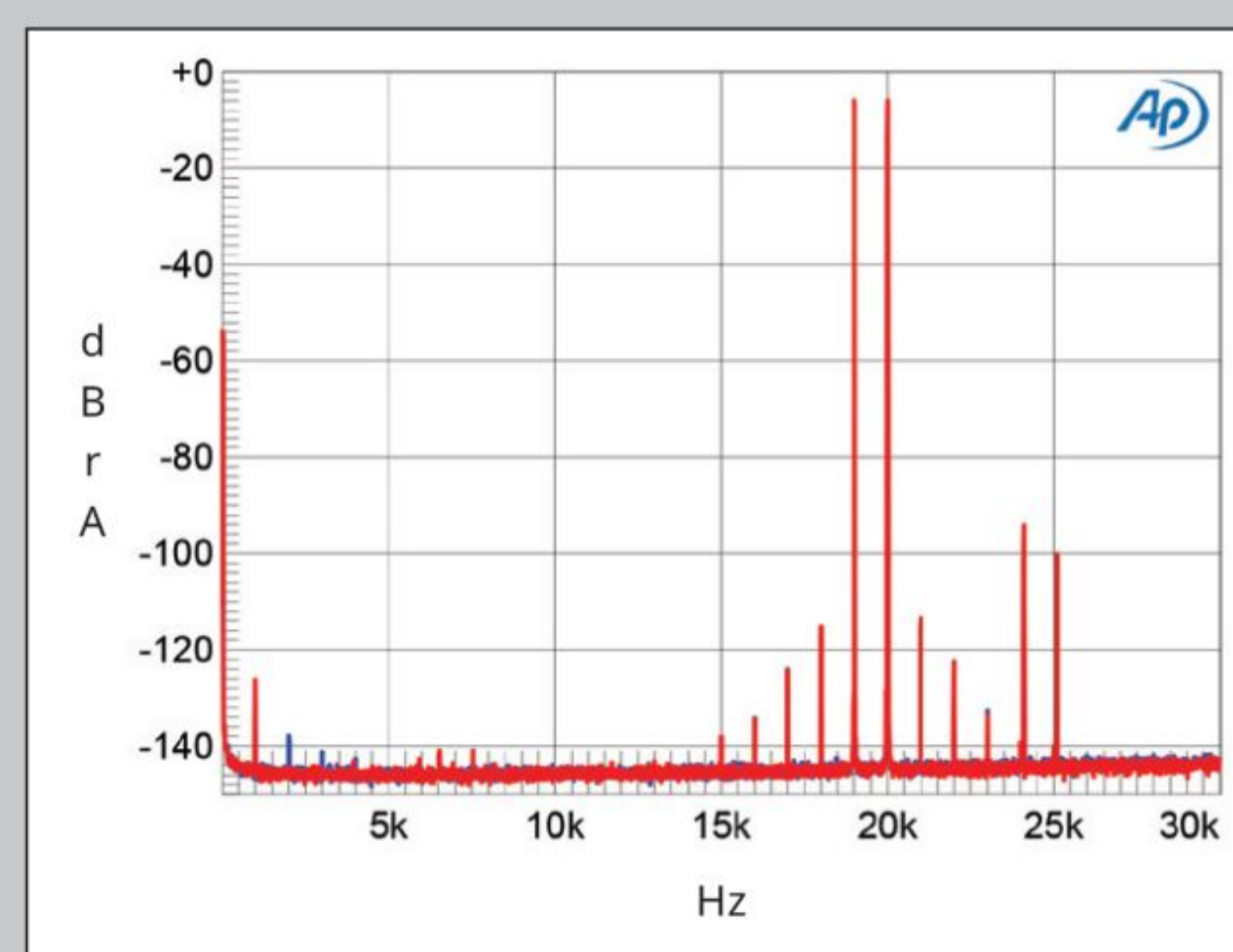


Fig.9 Moon 891, digital inputs, HF intermodulation spectrum, DC-30kHz, 19+20kHz at 0dBFS into 100k ohms, 24-bit, 44.1kHz data (left channel blue, right red; linear frequency scale).

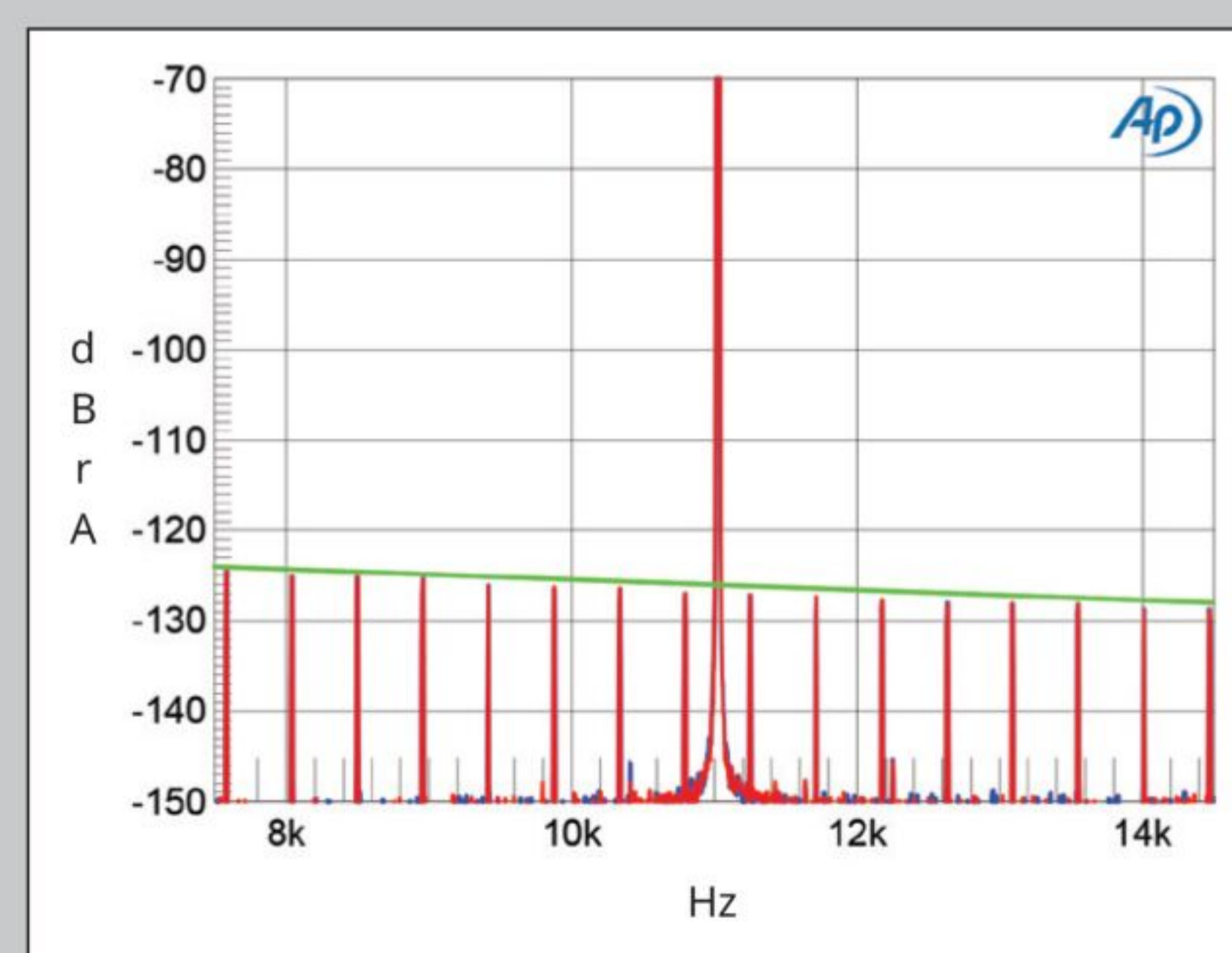


Fig.10 Moon 891, 16-bit TosLink data, high-resolution jitter spectrum of analog output signal, 11.025kHz at -6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

bag, get stuck at the top of a tree, or be too afraid to say “hi” to almost every dog I meet.

When buddy Scott Campbell stopped by and asked to hear one of our favorite standbys, Grant Green’s *Idle Moments* (24/192 FLAC, Blue Note/Qobuz), he praised the 891’s depiction of the sound of cymbals. I, in turn, lauded its extremely balanced sound. As much as either of us could have focused on what was missing, the sound seemed so complete and all of one piece that we reveled in what was present. Scott summed things up quite well when he said, “I would bet the 891’s preamp is fantastic, especially for the price.”

Price? Did Scott say “price”?



Cue Leontyne Price’s marvelously (if not flawlessly) sung 1965 recording of Charpentier’s “Depuis le jour” from *Louise*, an opera remembered mainly for this glorious, high-ranging soprano aria that climaxes on an ecstatic high-C before ending sensuously some two octaves lower. Price sounded gorgeous, every high note radiant with the changing colors then present in her thrilling, irresistibly seductive vibrato.

Without warning, the MiND app decided to play a previously cached track, William Corkine’s “The Second Tuning: 1. Come liue with me, and be my love” from Jordi Savall’s recently rereleased *The Puncckes Delight: Golden Age of English*

measurements, continued

The 891 behaved very similarly into 600 ohms, and with the single-ended output into both impedances.

Fig.15 shows how the THD+N percentage changed with frequency at 4V into 100k ohms (blue, red traces) and 600 ohms (green, gray traces). The distortion into both impedances is extraordinarily low, with only a slight rise below 100Hz. As with the digital inputs, the second harmonic was the highest in level, but even into 600 ohms lay at -106dB (0.0005%; fig.16). Intermodulation distortion was also superbly low in level (fig.17).

One of the Moon 891’s unbalanced line inputs can be turned into an MC- or MM-compatible phono input. As another reviewer will be auditioning the phono stage, I examined its measured performance in both MM and MC modes. To minimize noise, I connected a wire from one of the Audio Precision’s ground terminals to the grounding lug on the Moon’s rear panel.

Out of the box, while the MC input impedance and gain were correctly set to 100 ohms and 60dB, the MM input impedance was set to 10 ohms and the gain to 66dB. Using the front-panel buttons and menu, I reset these parameters to the recommended 47k ohms and 40dB. The MM input impedance was 42k ohms at 20Hz, 39k ohms at 1kHz, and 32k ohms at 20kHz. The MC mode’s input impedance was 103 ohms from 20Hz to 20kHz. In Variable mode, the MM input’s maximum gain at 1kHz was 50.1dB from the balanced and unbalanced outputs. In Fixed mode, the

gain was 40.3dB from both outputs. The MC input’s maximum gain was 68.1dB in Variable mode and 58.4dB in Fixed mode, again from both output types. Both input

types preserved absolute polarity at the balanced and unbalanced outputs.

The phono input’s RIAA correction (fig.18) was well matched between the

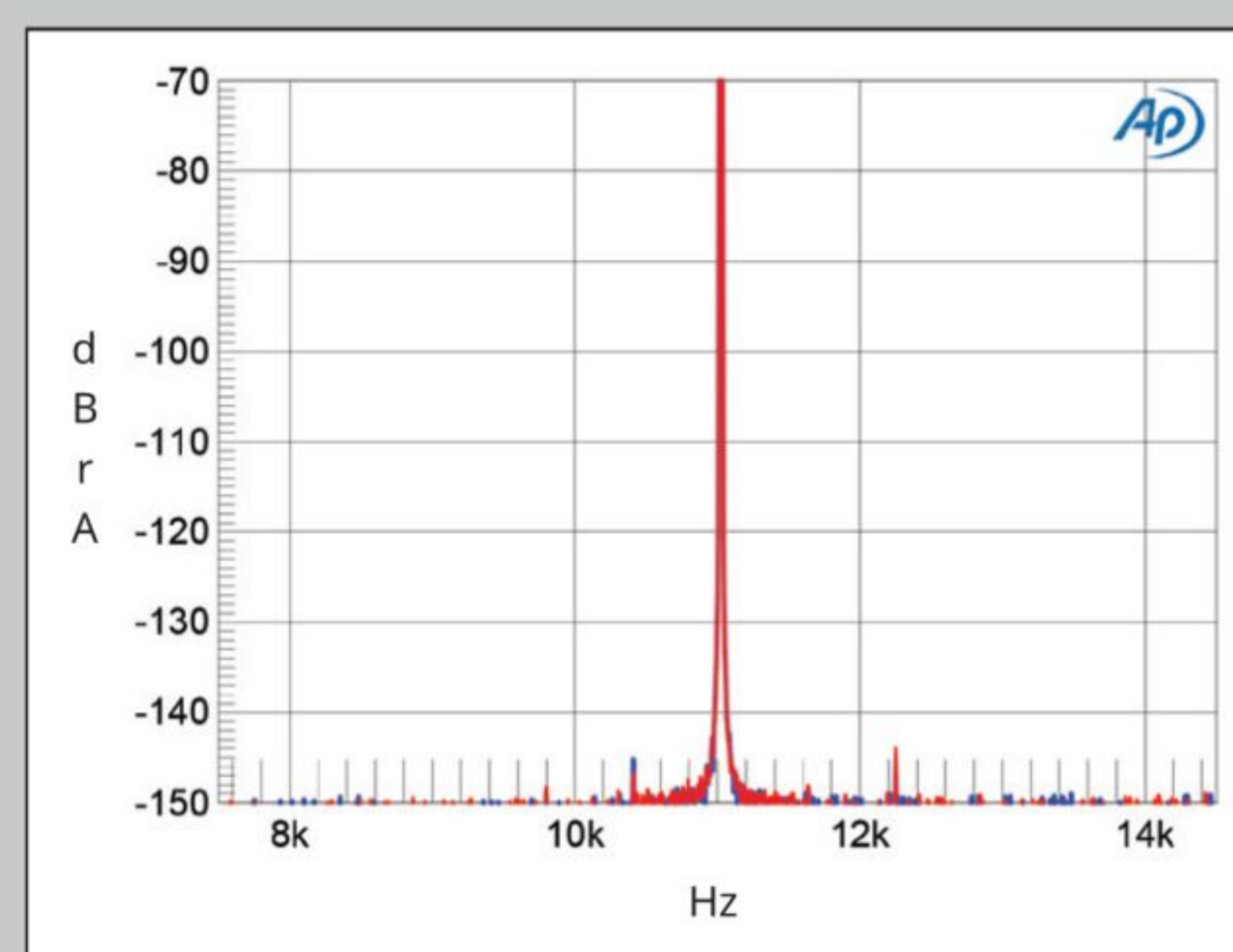


Fig.11 Moon 891, 24-bit TosLink data, high-resolution jitter spectrum of analog output signal, 11.025kHz at -6dBFS , sampled at 44.1kHz with LSB toggled at 229Hz (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, $\pm 3.5\text{kHz}$.

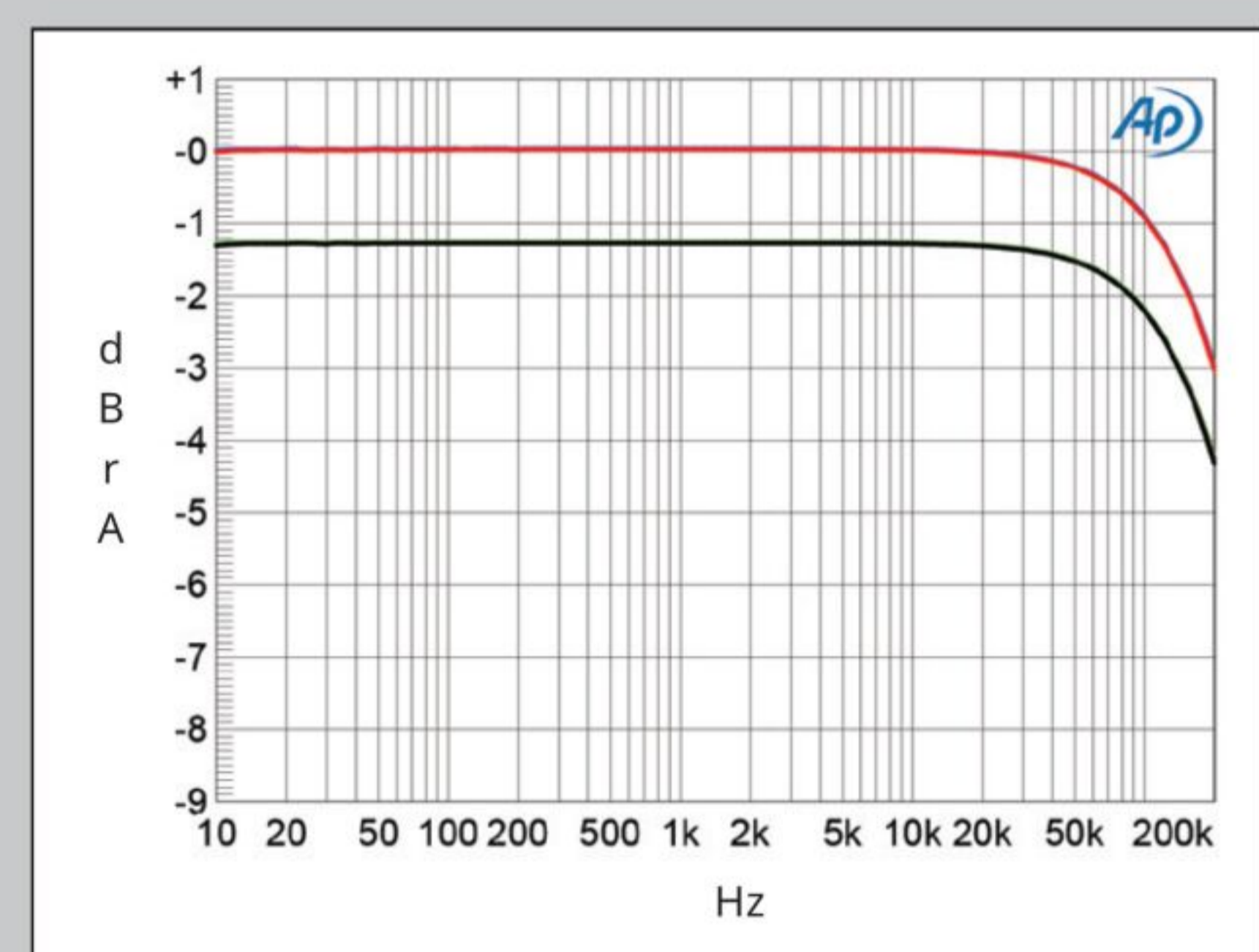


Fig.12 Moon 891, line input, balanced output, frequency response at 2V into 100k ohms (left channel blue, right red) and 600 ohms (left green, right gray) (1dB/vertical div.).

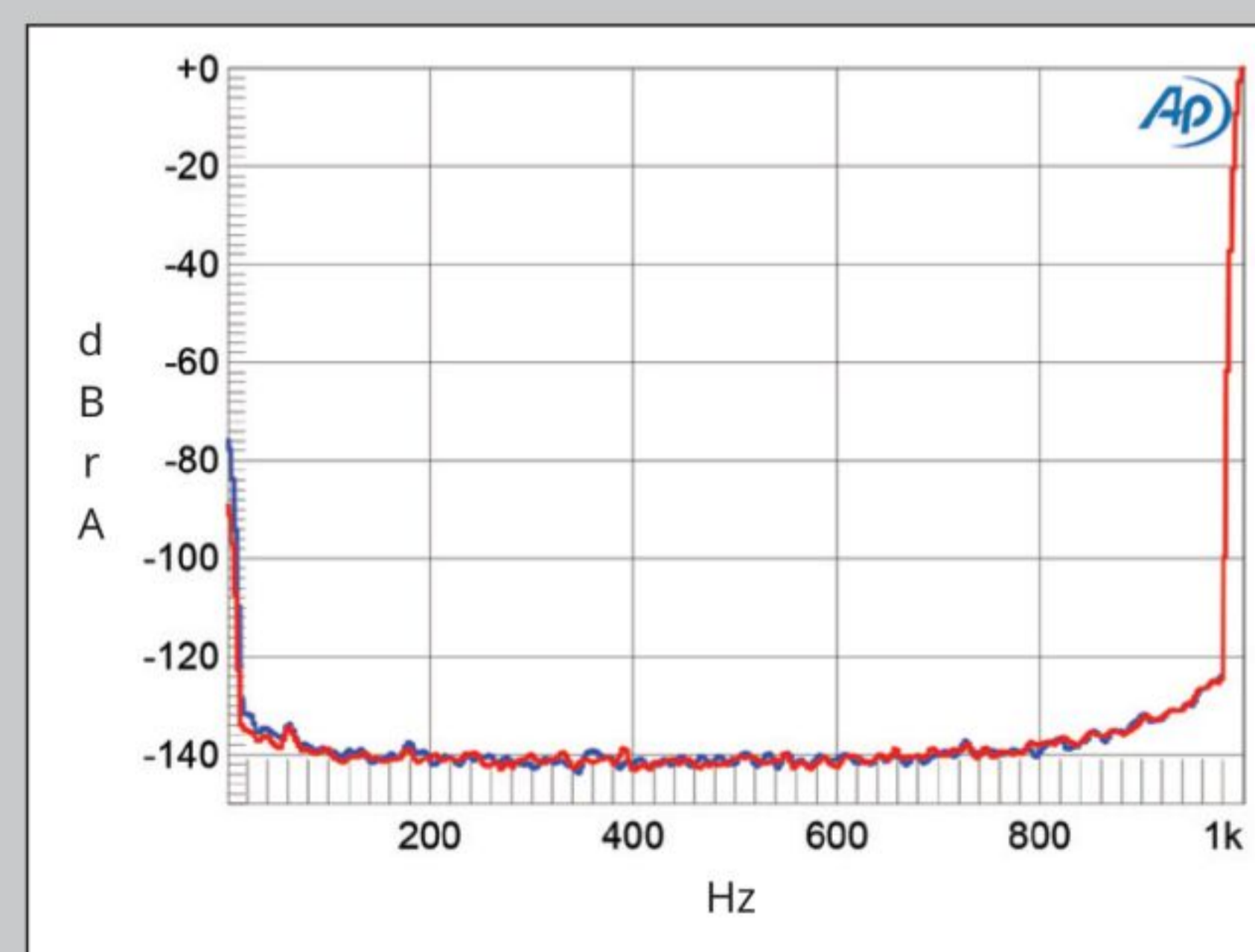


Fig.13 Moon 891, line input, balanced output, spectrum of 1kHz sine wave, DC-1kHz, at 2V into 100k ohms with volume control set to the maximum (left channel blue, right red; linear frequency scale).

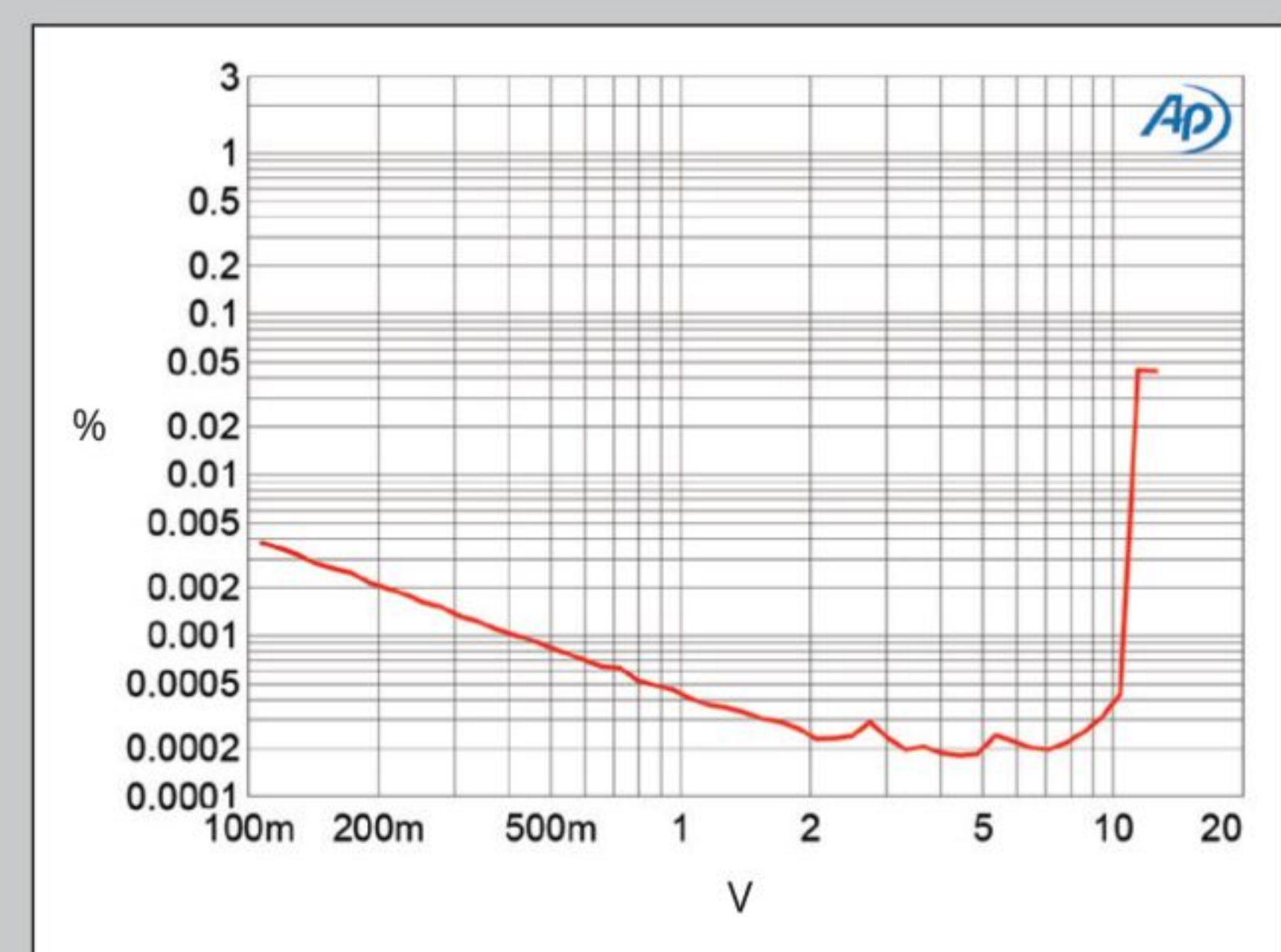


Fig.14 Moon 891, line input, balanced output, THD+N (%) vs 1kHz output voltage into 100k ohms.

Music for Solo Viol (24/96 FLAC, Alia Vox/Qobuz). As thoughts turned to my late friend, Charles Grossman,⁵ who insisted that the best test of a sound system was a recording of a single lute or theorbo, I marveled at the beautiful sound of Savall's viola da gamba. After jumping ahead a mere five centuries, I found myself equally enamored of the sound on Roger Eno's maximally different "Breaking the Surface" from the September release, *the skies: rarities* (24/96 FLAC, DG/Qobuz), which features the strings of Scoring Berlin and the synthesizers/flute of Christian Badzura.

The Stereophile music show

Finally, I began to do something I've wanted to do for a long time. After switching to a pair of bridged Moon 861 stereo amplifiers—the 891's intended complement—I grabbed the November 2024 issue of this illustrious publication and began auditioning music tracks cited by other reviewers. Because vinyl figured prominently in their choices, I couldn't find all the digital equivalents in Qobuz or Tidal.⁶ When I did find them, they were often early CD-quality transfers replete with the deficiencies and limitations that current hi-rez digital has overcome. But at least I could begin to appreciate the superb musical choices of my colleagues.

First up, with gratitude to Herb Reichert, baritone Leslie Quinn singing *Songs by Stephen Foster* (16/44.1 MQA, Nonesuch/Tidal), on a two-volume set that also showcased the gone-too-soon mezzo-

soprano Jan DeGaetani. Thanks to the 891's timbral accuracy, no one listening to this recording could ever mistake Gilbert Kalish's historic piano for a modern Steinway. I didn't remember Quinn's beautiful voice from the time I owned one volume of the two-volume project, but I did think that I already had a decent sense of what DeGaetani sounded like. Wrong. Her voice was far more beautiful and plaintive—so, so plaintive and touching—than what I recall hearing on the \$200 Magnavox all-in-one record player my father let me take to Amherst College so many, many years ago. Thank you, Moon 891, for letting me hear what I was missing, even if I could not hear it on vinyl.

On to Schoenberg's *Verklärte Nacht*, Op.4 (Transfigured Night). After being wooed by the midrange on Isabelle Faust and Daniel Harding's chamber version with the Swedish Radio Symphony Orchestra (24/48 FLAC, Harmonia Mundi/Qobuz), I turned to Fabio Luisi and the Danish National Symphony Orchestra's recent, far more sonically compelling recording (24/96 FLAC, DG/Qobuz). The sparkling string interplay in the fourth movement was magical, luminous, radiant, glowing—jaw-droppingly exquisite. Even though some inner lines were a mite muddy in the big climax, the bass lacked firmness, and the soundstage was flatter than I experi-

⁵ See [stereophile.com/content/death-audiophile](https://www.stereophile.com/content/death-audiophile).

⁶ They, in turn, cannot find vinyl pressings of many of the new hi-rez digital recordings I review.

measurements, continued

channels and extremely accurate. The ultrasonic response was down by just 1dB at 100kHz. Channel separation was superb, at 100dB in both directions across the audioband. The MM mode's wideband, unweighted S/N ratio, ref. 1kHz at 5mV, assessed at the balanced output with the inputs shorted to ground and the volume control set to the maximum, was an excellent 87.7dB in both channels. Restricting the measurement bandwidth to 22Hz–22kHz increased the ratio by 2dB, while inserting an A-weighting filter resulted in a ratio of 93.5dB. These ratios were taken with the gain set to 40dB. Resetting the gain to 60dB reduced the ratios by 20dB. The MC mode's S/N ratios, ref. 1kHz at 500 μ V and with 60dB gain, were less good, at 51dB (wideband), 52dB (audioband), and 56.75dB (A-weighted). To get the lowest noise from the Moon 891's phono input, the gain should not be set too high. Spectral analysis of the MM input's low-frequency noise floor indicated that no supply-related spurious were present.

To be sure I wasn't prematurely clipping the preamplifier's output, I examined the phono input's overload margins with the volume control set to "Fixed." Both the MM input's and MC mode's margins were impressively high from 20Hz to 20kHz, at 22.3dB ref. 1kHz at 5mV and 24dB ref. 1kHz at 500 μ V, respectively. Even with an input around 10dB below the 1kHz overload level, the only distortion harmonic pres-

ent was the second, at an inconsequential -100dB (0.001%). The levels of the intermodulation products with an equal mix of 19 and 20kHz tones were similarly

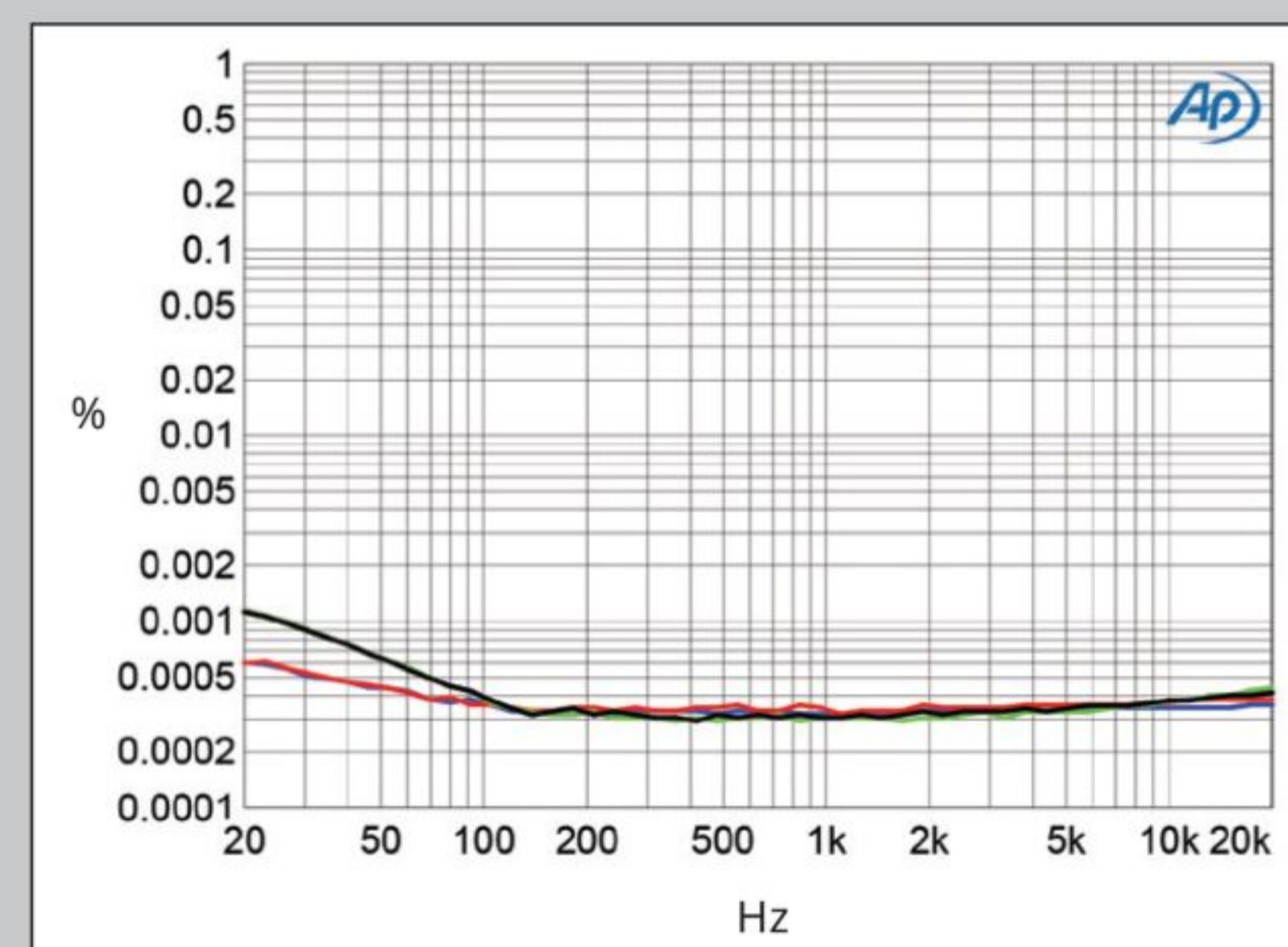


Fig.15 Moon 891, line input, balanced output, THD+N (%) vs frequency at 4V into: 100k ohms (left channel blue, right red), 600 ohms (left green, right gray).

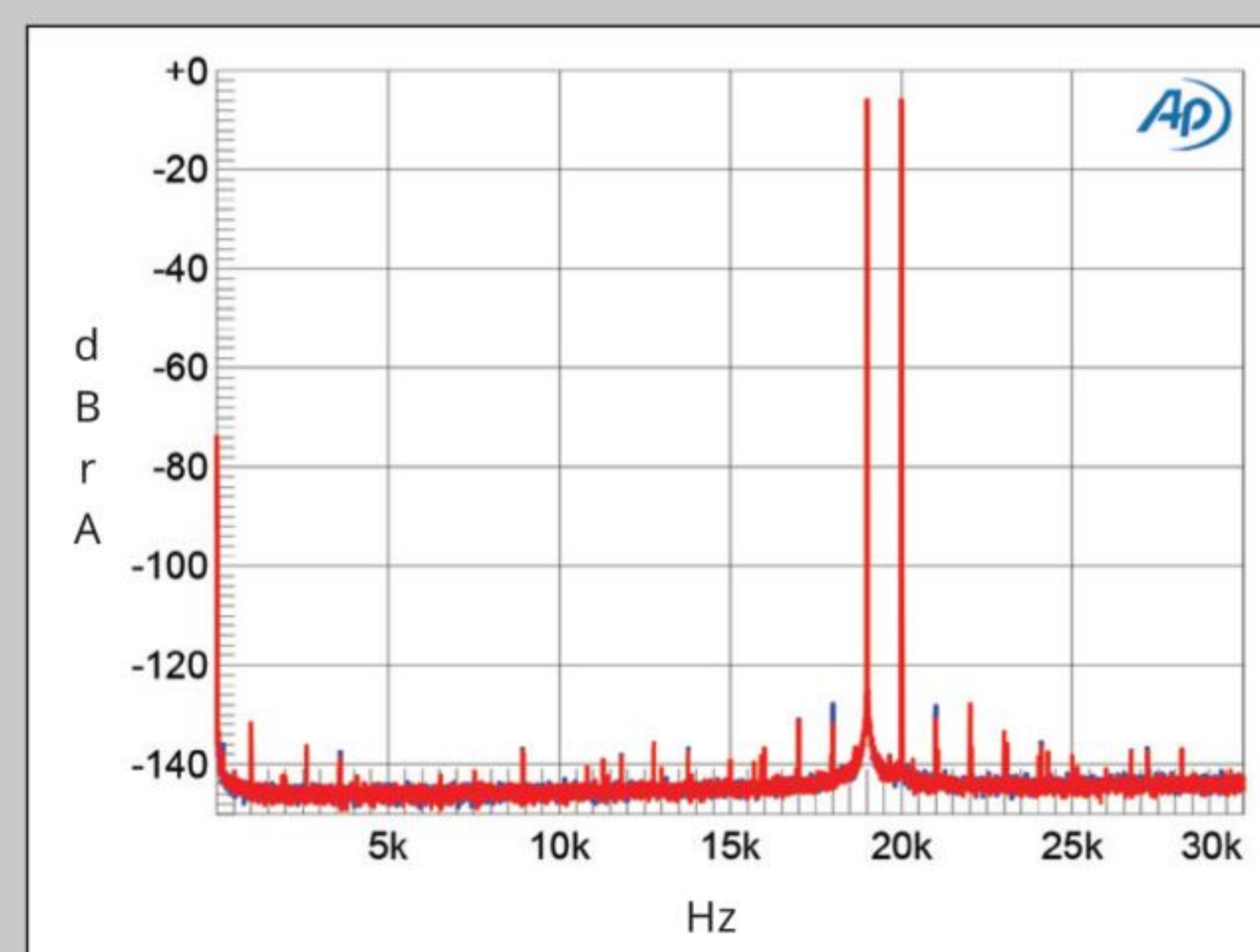


Fig.17 Moon 891, line input, balanced output, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 4V peak into 600 ohms (left channel blue, right red, linear frequency scale).

negligible.

The measured performance of the Moon 891 is state-of-the-art for both analog and digital inputs!—John Atkinson

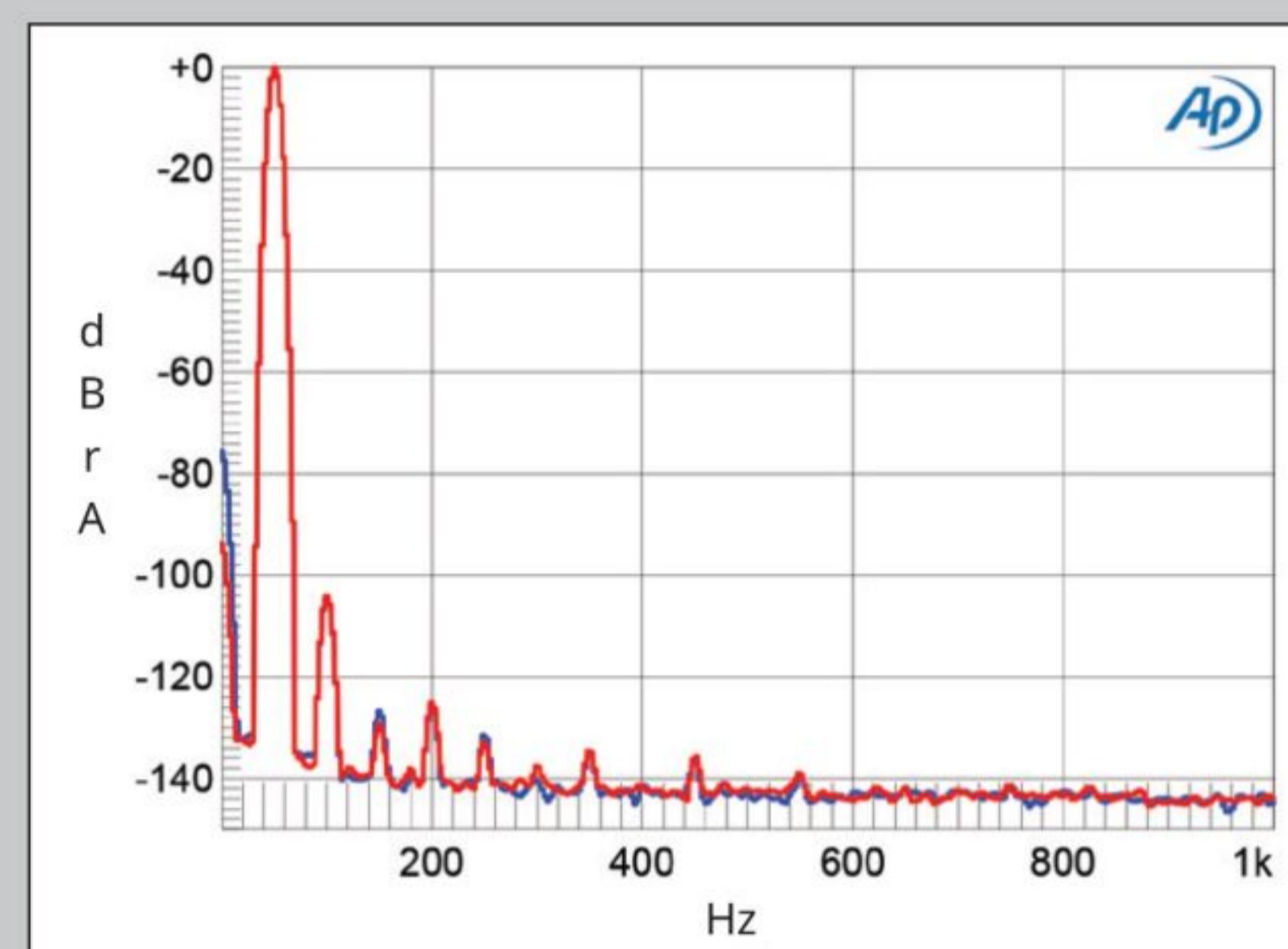


Fig.16 Moon 891, line input, balanced output, spectrum of 50Hz sine wave, DC–1kHz, at 4V into 600 ohms (left channel blue, right red, linear frequency scale).

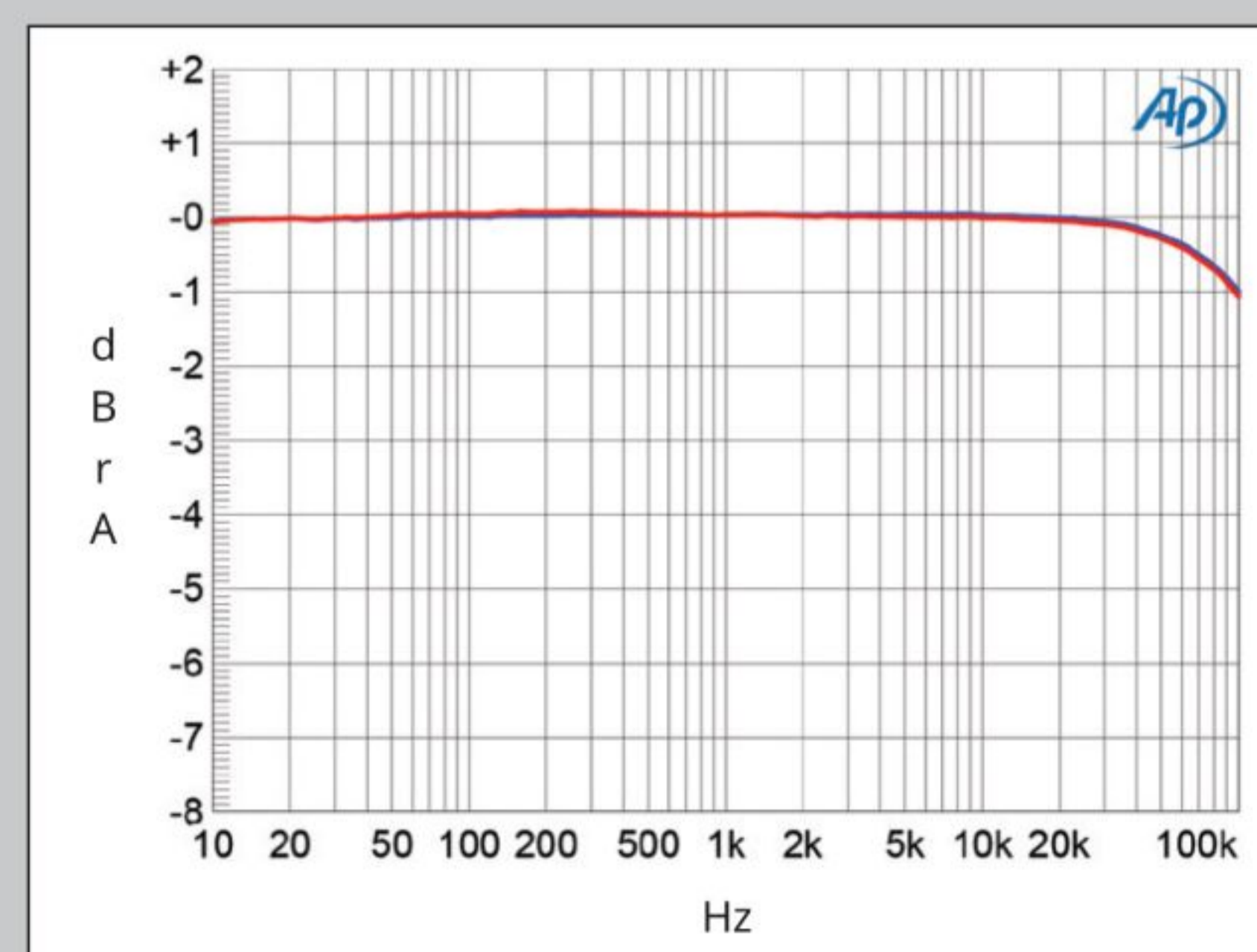


Fig.18 Moon 891, MM input, balanced output, response with RIAA correction (left channel blue, right red) (1dB/vertical div.).

ence through my far more expensive reference front-end, that did not stop me from loving what I heard or appreciating how glorious this music is.

From Alex Halberstadt: Nick Cave and the Bad Seeds' all-enveloping "Jubilee Street" from *Push the Sky Away* (24/44.1, Bad Seed Ltd./Qobuz). The 891 sorted the song's many layers of sound quite well. So well that I scribbled "Fabulous music" before cueing up another equally compelling track, "Soul Station," from the remastered version of *Introducing Roland Kirk* (16/44.1 FLAC, Vintage Pleasure/Tidal). The timbres of this music's different horns were beautifully differentiated, but the bass could have been tighter.

After tracks from Lou Reed and the Ray Brown Trio—again, bass wasn't entirely tight on Brown's "Exactly Like You" from *Soular Energy* (16/44.1 FLAC, Concord/Qobuz), and the higher-pitched instruments predominated over Brown's bass, which did not feel right—it was on to Copland's *Rodeo*, Rickie Lee Jones's "Under the Boardwalk," and Neil Young's "Tonight's the Night" from his eponymous album (24/192 FLAC, Reprise/Qobuz). At last, a true hi-rez remastering! Anyone who questions whether 24/192 makes a difference over 16/44.1, 24/44.1, or 24/96 needs to stream this album through the Moon 891. The music felt far more immediate and touchable than some of the tracks I'd previously auditioned, but bass remained a mite muddy.

Final tests

After switching cables and apps, I revisited some of the same tracks using the considerably more expensive Innuos Statement Next-Gen/PhoenixNet combo with the Innuos Sense app and InnuOS. The sound wasn't incrementally better; it was way better. Leaps and bounds better. Bass that had lacked firmness was now absolutely firm and clear. Fuller as well, and in correct proportion to instruments and voices higher in the range. Transparency and air notably increased, the soundstage grew dramatically in sound and depth, etc., etc. Amen. You know the story. Veteran review readers have heard it a thousand times. But that doesn't make it any less true.

This was anything but a case of "diminishing returns." It was a major improvement, albeit one costing well over double the price. (Hey, if you use cables as costly as mine, you're approaching triple the price.) An unfair comparison, to be sure. But it confirmed something friend Scott had said over 850 words ago: Given a better

streaming source, the excellence of the 891's DAC and preamplifier stood out. Together, they reach into music's heart and soul, lay it out for all to hear, and do so with a transparency and truth that deserve copious praise.

Two final tests. Initially, differences in sound quality between Moon's MiND software and Roon seemed negligible. But repeated listens clarified that Roon sounded a little drier, flatter, grayer, and less filled with life. MiND's images were surrounded by more air and distinguished by rounder bass. On Luisi's wonderful Schoenberg recording, only MiND transmitted the music's magical luminous transfiguration. Said Scott, whom I invited over to hear what I'd already discovered, "Only MiND lets me hear the rear of the stage. Music also flows easier; it's more relaxing to listen to, with images better separated."

I also confirmed what Koullisakis had said about the sound of streaming vs playing the same file from a USB stick (even one with a solid state drive). On the Britten Violin Concerto with which I began this review, the USB source delivered sound that was a bit drier, grayer, and deficient in space. Streamed from Qobuz, the orchestral acoustic seemed far more convincing, and Faust's violin sounded fuller, with more saturated tone color.

Summing it up

Just as last month, I wrote that I have never reviewed an amplifier in the Moon 861's price range with sound as satisfying, I must now say the same about the Moon 891 network player/preamplifier. Complete with an up-to-date DAC that decodes high-resolution PCM, MQA, and DSD, it's a fine-sounding, easy-to-operate one-stop front-end that requires minimal cabling and setup acumen for it to shine.

Can you do better? Of course. To do so, will you, perhaps, have to run your finances into the ground, put a pot under the hole in your leaky roof, default on your mortgage, tell your kids it's community college or no college at all, or fail to leave enough in your will to pay for more than a shallow grave marked by a vase of plastic flowers? Quite possibly.

Better, then, to celebrate what the Moon 891 does provide: truthful full-range sound that is so satisfyingly complete that the forever-seeking Serinus kept focusing on what was present rather than what was lacking. The 891's performance is musical to the core. Highly recommended. ■

ASSOCIATED EQUIPMENT

Digital sources dCS Vivaldi APEX D/A processor, Vivaldi Upsampler Plus, Vivaldi Master Clock; EMM Labs DV2 Integrated DAC, Meitner MA3 Integrated DAC; Innuos Statement Next-Gen Music Server and PhoenixNET network switch; Small Green Computer Sonore optical Module Deluxe with Broadcom/Avago AFBR-5718PZ 1GB SX-SFP, Gen 5 Fiber Optic module (2); Nordost QNet switch and QSource linear power supply (2); Sonore Audiophile Linear Power Supply; Synology 5-bay 1019+ NAS with Ferrum Hypsos linear/switching hybrid power supply; Linksys MR9000 mesh router and Arris modem; Apple 2023 iPad Pro and 2017 MacBook Pro laptop with 2.8GHz Intel i7, SSD, 16GB RAM.

Power amplifiers Dan D'Agostino Momentum M400 MxV monoblocks, Accuphase

A-300 monoblocks, Moon 861 stereo amplifier (2) used as monoblocks.

Preamplifier Dan D'Agostino Relentless.

Loudspeakers Wilson Audio Specialties Alexia V with Løke subwoofers.

Cables Digital: Nordost Odin 1, Odin 2, and Valhalla 2 (USB and Ethernet), Frey 2 (USB adapter); AudioQuest WEL Signature; Wireworld Platinum Starlight Cat8 (Ethernet), OM1 62.5/125 multimode duplex (fiber optic). Interconnects: (XLR): Nordost Odin 2 and Blue Heaven subwoofer, AudioQuest Dragon, Canare (subwoofers). Speaker cables: Nordost Odin 2, AudioQuest Dragon. AC: Nordost Odin 2, Valhalla 2, Valhalla 1; AudioQuest Dragon and Firebird; Kimber PK10 Palladian. Umbilical cords: Ghent Audio Canare on NAS; QSource Premium DC cables with Lemo terminations for

QSources; SotM sPS-500 umbilical cable for SotM Master clock.

Accessories Grand Prix Monza 8-shelf double rack and amp stands, 1.5" Formula platform; Symposium Ultra Platform; Nordost 20-amp QB8 Mark III, QKore 1 and 6; Titanium and Bronze Sort Kones, Sort Lifts; Stromtank S-4000 MK II XT power generator, SEQ-5 Audio Distribution Bar; AudioQuest Niagara 7000 and 5000 power conditioners, NRG Edison outlets; Environmental Potentials EP2050EE surge protector/filter; Wilson Audio Pedestals; A/V RoomService Polyflex Diffusers; Resolution Acoustics room treatment; Stillpoints Clouds (8); HRS DPX-14545 Damping Plates; Marigo Aida CD mat.

Dedicated music room 20' L × 16'4" W × flattens at 9'4" H.—Jason Victor Serinus