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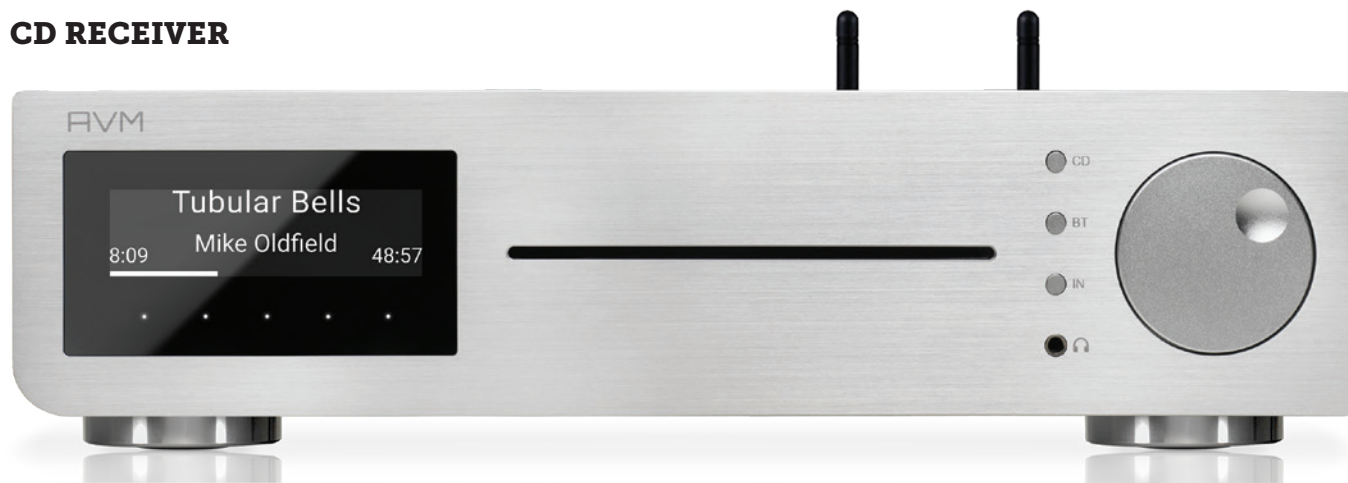0 6>
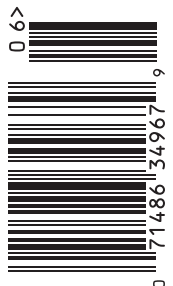
SASHA MATSON

AVM Inspiration CS 2.3

CD RECEIVER

In the 1960s, my dad gave me a Panasonic receiver with two cube speakers, just in time for the advent of FM stereo radio in the San Francisco Bay Area. Out of the blue one night, he just walked in with it. The receiver allowed me to plug in a record player, though I only had a few LPs. Later, when I went off to college, my mom took me shopping for a new stereo. I chose a Kenwood integrated amplifier—without a tuner but with the capability to plug in a tape deck, which I did. During my undergrad years, it served me well. Later, I switched to an NAD receiver, which allowed me to listen to the radio again.

When it was time for my sons' high school graduation, I gave them identical pairings of Peachtree integrated amps and Nola loudspeakers, bought at the late, lamented Lyric Hi-Fi in Manhattan. That's where I first heard the term "Swiss Army knife" applied to audio. The Peachtree boasted an internal DAC and a USB input for a CD transport, but no phono stage or radio.

For a long time, my hi-fi life was integrated. More recently, it evolved to include high-quality separate components.

AVM (Audio Video Manufaktur) is based in the small town of Malsch, Germany. Company owner and designer Udo Besser explained his priorities for their new Inspiration CS 2.3 integrated amplifier—a true Swiss Army knife—like this. "Once upon a time, in order to have dynamic, engaging music in the home from a number of sources, a whole stack of gear was needed: preamp, power amp, phono preamp, DAC, streamer, and on and on. That was then, this is now, and AVM's all-in-ones can provide genuinely engaging sound using any source imaginable—all from a single, elegant box."

Lately, I have rearranged the deck chairs, assembling three audio systems, clustered in three price categories. The Upstairs System is all separates, and the Downstairs System is centered around a McIntosh integrated amplifier. For the Apartment System, I have been using another Peachtree Nova integrated—that makes three I've purchased! It was in the latter rig that the AVM Inspiration CS 2.3 ($6995) seemed most appropriate, as I realized immediately when *Stereophile* Editor Jim Austin first described it to me.

Honey, I shrunk the amps!

Describing the appearance of the AVM Inspiration CS 2.3 is easy.

SPECIFICATIONS

Description Solid state class-D stereo streaming integrated amplifier with DAC, CD transport, phono preamp, class-A headphone amplifier, remote. Analog inputs: 4 pair RCA (2 line, phono, phono loading). Digital inputs: HDMI ARC, USB-A, LAN, 2 Coax, WLAN, Bluetooth anntennas. Analog outputs: 1 pair RCA variable, 1 pair RCA fixed. Loudspeaker outputs: stereo pair 3-way binding posts. $1/8$" (3mm) unbalanced headphone. Input sensitivity: 275mV. Power output: 140Wpc (18.45dBW) at 1% THD+N into 4 ohms. Tone controls: Balance, Bass, Treble, Loudness. Standby power consumption, 1W. Software supported: Roon, Qobuz, Tidal Connect, Spotify Connect, HIGHRESAUDIO, AirPlay 2, Web Radio, UPnP. Streams up to 24/192 PCM, DSD256 (native). **Dimensions** 13.3" (340mm) W × 3.6" (92mm) H × 12.8" (325mm) D. Weight: 15.6lb (7.1kg). **Finish** Black, Silver, CELLINI chrome, plus custom finishes. **Serial number of unit reviewed** AVM-1-01039, "Made in Germany." **Price** $6995. Approximate number of US dealers: 10. Warranty: 4 years with registration.

Manufacturer AVM Audio Video Manufaktur GmbH, Daiamlerstr. 8, 76316 Malsch, Germany. Tel: +49 (0) 7246 30991-0. Web: avm.audio. US distributor: Bluebird Music Ltd., 1100 Military Rd., Kenmore, NY 14217. Tel: (416) 638-8207. Web: bluebirdmusic.com.

Much harder is explaining everything this small box contains. Measuring just 13.3" wide (skinnier than a standard "rack" unit), 12.8" deep, and 3.6" high including three nice metal feet, you can fit this unit pretty much anywhere. Thanks to the use of class-D amplification and clever implementation of everything else, the 2.3 runs cool enough that other things can be stacked on top of it. I even put a turntable on top, gaining some vibration isolation with IsoAcoustics footers. In such a configuration there's a risk of hum due to electromagnetic coupling—but I heard no hum. If I had, I would have abandoned this setup immediately. Bottom line: The CS 2.3 is apartment friendly; you could use this thing in a camper van!

The design aesthetic of the Inspiration CS 2.3 is minimalist. The top, sides, and front are handsomely finished, available in black or silver metal, plus custom options. On the left, a modestly sized screen, which is partially a touchscreen, displays various operating parameters and provides access to various functions. In the middle is a slot for feeding a CD drive, then three small, multipurpose buttons and a 1/8" miniplug headphone jack. On the right is a single large knob for adjusting volume. Besser described the volume control to me as "ballistic": How fast you turn the dial affects how fast the level changes; turn it slowly for small, precise changes, fast for larger adjustments.

The back panel is packed, with connectors for two antennas— Wi-Fi and Bluetooth antennas—two coax S/PDIF, on RCA; a USB-A connection for flash drives and hard disks; a LAN/Ethernet port; HDMI; two sets of analog inputs on RCA; one phono input on RCA

MEASUREMENTS

I measured AVM's Inspiration CS 2.3 using my Audio Precision SYS2722 system,[1] controlling the amplifier with the AVM RC X app on my iPad mini. As the AVM is a class-D design, and class-D amplifiers emit relatively high levels of ultrasonic noise that would drive the analyzer's input into slew-rate limiting, all the measurements other than frequency response were taken with Audio Precision's auxiliary AUX-0025 passive low-pass filter. (The AUX-0025 mitigates noise above 80kHz and eliminates noise above 200kHz.) Without the filter, there was approximately 400mV of ultrasonic noise with a center frequency of 400kHz present at the loudspeaker terminals.

Looking first at the single-ended analog line inputs: With the AVM's Input Gain set to "0dB," the volume control set to its maximum—the control operates in accurate 0.5dB steps—and the tone controls bypassed, the voltage gain at 1kHz into 8 ohms measured 48.1dB at the speaker terminals, 22.2dB at the headphone output, and 18.3dB at the preamplifier output. The line input preserved absolute polarity (ie, was noninverting) from all three output types, and the input impedance was low— the specified 3.44k ohms—at all audioband frequencies.

The preamplifier output impedance was 297 ohms from 20Hz to 20kHz; that at the headphone output was 48 ohms, again from 20Hz to 20kHz. The CS 2.3's output impedance at the speaker terminals was very low at 20Hz and 1kHz, at 0.09 ohm, rising to 0.35 ohm at 20kHz. (These values include the series resistance of 6' of spaced-pair speaker cable.) Consequently, the variation in frequency response with our standard simulated loudspeaker,[2] taken without the AP low-pass filter (fig.1, gray trace), was minimal. This graph was taken with the volume control set to its maximum; the superb channel matching was preserved at lower settings of the control. Into 8 ohms (fig.1, blue and red traces), there is a slight rise in response above the audioband, which correlates with a critically damped overshoot on the waveform's leading edges with the CS 2.3's reproduction of a 10kHz squarewave into this load (fig.2).

Fig.3 shows the effect of the AVM's bass

1 See stereophile.com/content/measurements-maps-precision.
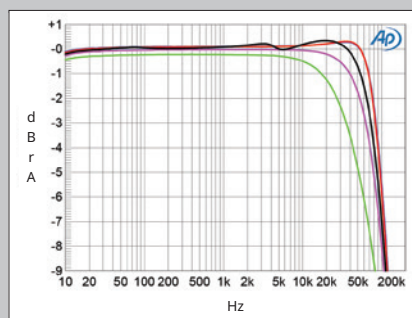2 See stereophile.com/content/real-life-measurements-page-2.

Fig.1 AVM Inspiration CS 2.3, line input, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (green) (1dB/vertical div.).
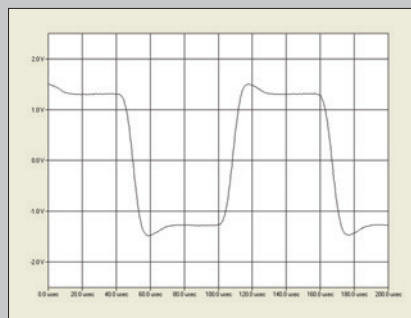
Fig.2 AVM Inspiration CS 2.3, line input, small-signal, 1kHz squarewave into 8 ohms.

(yes, there's a phono preamp inside), and two more RCA inputs for phono loading plugs. (Yes, that preamp can handle MC cartridges.) The outputs are two TosLink; a stereo pair of preamp outputs on RCA that can be used for a subwoofer; a single line output on RCA (a single stereo pair); and a pair of small binding posts for loudspeakers. Also on the back is the AC power switch. The CS 2.3 is designed to make extensive use of standby mode, accessed from the AVM RC X app (about which more momentarily) or front panel control buttons. Standby power consumption is a single watt.

The CS 2.3 runs unbalanced, so there are no balanced inputs or outputs. Analog signals remain analog; there is no internal A/D conversion.

Besser and his AVM engineering team wrestled with the trade-off of size versus audio quality, because compact size was a central part of the CS 2.3's design brief. Besser believes they won the battle. "The CS 2.3 may be compact and light in weight, but it's no lightweight in its performance or versatility," he told me. "Keep in mind all that would be in that single box: a stereo power amplifier producing 140W per channel, a line stage, a phono preamp, a headphone amp, a streamer, and a CD transport. Trial-and-error prototypes made it clear that effectively utilizing the available space would require the latest in 3-D modeling and simulation software."

measurements, continued

and treble controls set to their +6dB and –6dB positions. Both controls offer a range of ±6dB. However, as can be seen from this graph, compared with the level with the controls bypassed (central traces), they also change the level between 200Hz and 4kHz by +2.2dB when set to 6dB cut and by –1.8dB when set to 6dB boost. Channel separation was good rather than great, at 60dB R–L and 70dB L–R, both values consistent across the audioband.

With the ultrasonic filter installed, the CS 2.3's line inputs shorted to ground, and the volume control set to the maximum,
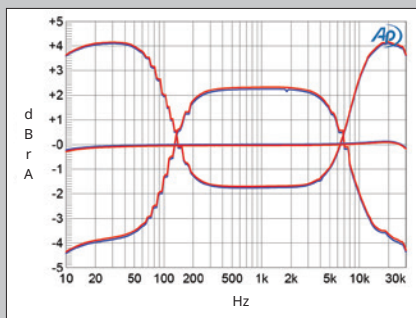
the wideband, unweighted signal/noise ratio (ref. 2.83V into 8 ohms) measured 64dB in both channels. Restricting the measurement bandwidth to 22kHz increased the ratio to 68dB, and an A-weighting filter increased it further, to 70.9dB. Spectral analysis of the AVM's low-frequency noisefloor (fig.4) revealed power-line–related AC spuriae at 120Hz and 240Hz. The blue and red traces in this graph were taken with the volume control set to its maximum; reducing the volume by 20dB (green, gray) dropped the level of the random noise by the same 20dB but
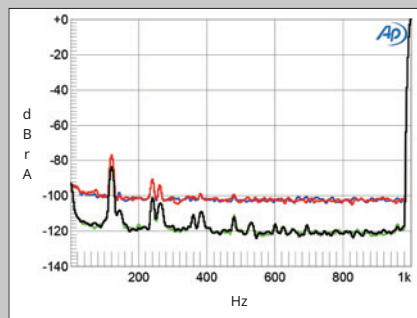
only reduced the levels of the power supply spuriae by a little.

The CS 2.3 is specified as delivering a maximum output power of 140Wpc into 4 ohms (18.45dBW) at 1% THD+N, which is our usual definition of clipping. The CS 2.3 clipped at 125Wpc into 8 ohms (21dBW, fig.5) and at 140Wpc into 4 ohms (18.45dBW, fig.6), precisely meeting its specification. Distortion levels at 12.67V, equivalent to 20W into 8 ohms and 40W into 4 ohms (fig.7), were very low, though with the usual increase in the top two octaves, which will be due to employing
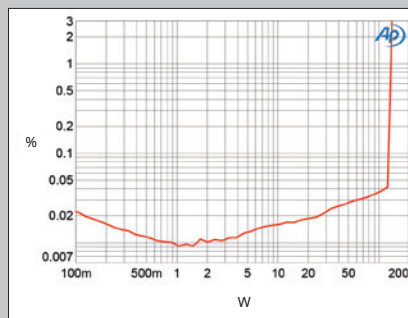

Fig.3 AVM Inspiration CS 2.3, line input, frequency response at 2.83V into 8 ohms with Bass and Treble controls set to "+6dB" and "–6dB" (left channel blue, right red) (1dB/vertical div.).

Fig.4 AVM Inspiration CS 2.3, line input, spectrum of 1kHz sinewave, DC–1kHz, at 1W into 8 ohms with volume control set to the maximum (left channel blue, right red) and to –20dB (left cyan, right magenta) (linear frequency scale).

Fig.5 AVM Inspiration CS 2.3, line input, THD+N (%) vs 1kHz continuous output power into 8 ohms.

Though the AVM CS 2.3 is as close to being a universal audio tool as any component I've experienced, a few tradeoffs were made in relation to space and cost. There is no USB-B input, which means you can't easily use your computer as a source of music data—unless the computer has an HDMI output, which many do. The loudspeaker posts were too small to handle the hefty spade lugs on most of my speaker cables. "In the predecessor model (the Inspiration CS 2.2), you could only use banana plugs," Besser told me. "Then we found these cute little terminals that you can use with smaller cables." Cute is one word; flimsy is another. The solution here is cables with banana plugs, which worked fine. I left my stripped-wire days behind me in the college dorms.

Not so long ago, class-D amplification was a hot-button topic in the audio world. Some loudspeakers seemed to sound better than others with certain class-D amplifiers. As with certain high-output-impedance tube amps, but for different reasons, the sonic balance depended on the impedance curves of the loudspeaker in use.

Speakers with rising impedance at the ends of the audio spectrum interact with some class-D amps, in a negative way. Tinny, harsh digititis in the upper audible frequencies could result.

As Udo Besser said, "That was then." This is now.[1]

Two companies based in Denmark, Purifi and Pascal, provide

1 Note, however, that the Pascal module in the CS 2.3 does show a small dependence on output impedance—enough, perhaps, that loudspeakers with sharply rising impedance in the treble should perhaps be avoided. See fig.1 in Measurements.—**Jim Austin**

measurements, continued

decreasing corrective negative feedback as the frequency increases.

The distortion signature appears to be primarily second harmonic in nature (fig.8) and low in level at –74dB (0.02%, fig.9), though the supply-related spurious tone at 120Hz was close to the same level. Intermodulation distortion was also very low: Even into 4 ohms (fig.10), the difference product at 1kHz lay at –79dB (0.01%).

Turning to the AVM's phono input, I connected a wire from the Audio Precision's ground terminal to the grounding lug on the AVM's rear panel to obtain the lowest noise. This input preserved absolute polar-

ity at all three outputs in both MM and MC modes. Without any loading resistors, the input impedance measured 45k ohms at 20Hz and 1kHz, dropping slightly to 34k ohms at 20kHz. With the 1000 ohm loading resistors, the impedance measured 979 ohms across the audioband; with the 200 ohm resistors, it was 199 ohms; and with the 100 ohm resistors, it was exactly 100 ohms.

In MM mode, the maximum gain at 1kHz was 58.56dB at the Pre output, 62.35dB at the headphone output, and a very high 88.4dB at the loudspeaker outputs. The gains in MC mode were around

20dB higher. To avoid clipping the output stages, I turned off the speaker outputs and performed all the subsequent testing using the preamp output with the volume control set to –10dB.

The phono input's RIAA correction (fig.11) was superbly accurate, but with a rolloff in the low bass reaching –3dB just above 10Hz. The wideband, unweighted S/N ratio in MM mode with the inputs shorted to ground was a very good 69dB in both channels, ref. 1kHz at 5mV. Restricting the measurement bandwidth to the audioband increased the ratio to 74dB, while an A-weighting filter further increased the
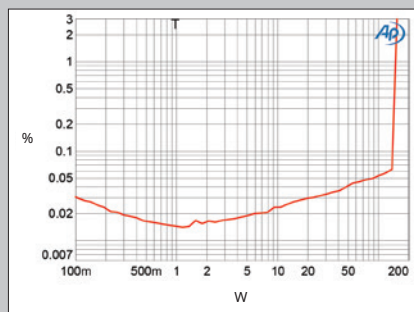

Fig.6 AVM Inspiration CS 2.3, line input, THD+N (%) vs 1kHz continuous output power into 4 ohms.
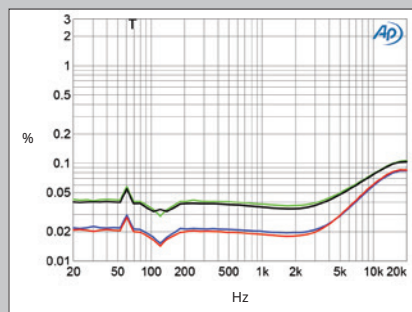

Fig.7 AVM Inspiration CS 2.3, THD+N (%) vs frequency at 12.67V into: 8 ohms (left channel blue, right red) and 4 ohms (left green, right gray).
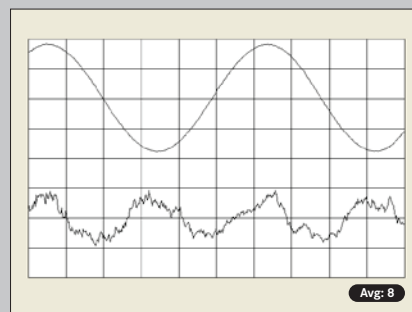

Fig.8 AVM Inspiration CS 2.3, line input, 1kHz waveform at 50W into 8 ohms, 0.026% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

most of the modules utilized by class-D audio amplifier designers worldwide. The Inspiration CS 2.3 utilizes the Pascal U-PRO 2S module, with its integrated switching power supply, and an additional power bank, which is split into analog (eg, phono) and digital (for class-D) sections; Besser says this dramatically improves the sound quality.

Many birds, one stone

A potpourri of setup items can be accessed from the CS 2.3's front panel, and also from the AVM RC X App once you've got it up and running. These include Volume Limit (factory default to 70%; change to 100% in the Personal Setup menu for highest quality); Bluetooth device pairing; Balance; Tone Control (set to Linear to deactivate); Loudness; Digital Filter (choose Steep, or Smooth); Display; Input Gain (each input can be set independently); Skip Unused Inputs; Auto Power Down (can be defeated); Update Firmware; and a lot more.

As previously mentioned, the CS 2.3's back panel has connections for two antennas, one for Wi-Fi, one for Bluetooth; both antennas are, of course, in the box. A network connection is necessary to make use of the AVM RC X App and, of course, the CS 2.3's many streaming features. AVM recommends a wired connection for best performance: "All AVM devices with integrated AVM X-STREAM Engine prefer a wired network connection, which usually allows a higher bandwidth and is also less susceptible to interference," the operating manual says. Assuming there's a wire close by, a wired connection is also much easier to set up. If you require a wireless connection, the manual's setup instructions are thorough, although the included screenshots from the app are blurry and difficult to read. I got it to work, but not without some effort. In my apartment setting, the CS 2.3 is sitting about 4' from my modem/router, so I used a wired connection.

There are many fine, multifunctional integrated amps on the market. One thing that sets the CS 2.3 apart is its CD transport—a really good, slot-loading

measurements, continued

ratio to 79dB. These ratios were all 4–5dB lower in MC mode, ref. 1kHz at 500μV, but this is still a low level of noise.

The phono input's overload margins in MM mode, ref. 1kHz at 5mV, were relatively high at 15–17dB from 20Hz to 20kHz. In MC mode, ref. 1kHz at 500μV, the margins at 20Hz and 1kHz were the same as in MM mode, but the 20kHz margin was a little lower, at 10.4dB. With a 1kHz signal at an input level 6dB below the overload voltage, the phono input's distortion signature was an equal mix of second and third harmonics, both lying at a very low −100dB (0.001%, fig.12). The level of the

1kHz difference product with an equal mix of 19 and 20kHz tones was also very low, at −80dB (0.01%).

To examine the performance of the CS 2.3's digital inputs, I used the Audio Precision's optical and coaxial S/PDIF outputs, as well as playing test signals on a CD-R. The optical input locked to datastreams with a sample rate up to 96kHz; the coaxial input locked to 192kHz data. The CD transport offered superb error correction. Playing the *Pierre Verany Test CD*, there were no audible glitches until a single 4mm gap or two successive 3mm gaps in the data spiral. (The Compact Disc standard requires

only that a player cope with gaps of up to 0.2mm.)

With the volume control set to its maximum, a 1kHz digital signal at −30dBFS resulted in an output level of 14.56V into 8 ohms from the loudspeaker output, which is just 6.75dB below the clipping voltage. Reducing the Input Gain by the maximum 9.5dB will still result in the CS 2.3 speaker outputs clipping with full-scale data and the volume control set above −14dB. With the Input Gain set to "0dB," data at −20dBFS gave maximum levels of 3.32V from the headphone output and 2.12V from the preamplifier output. As with the
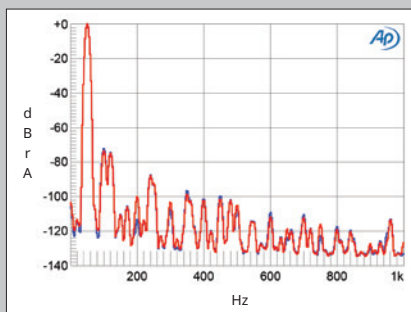

Fig.9 AVM Inspiration CS 2.3, line input, spectrum of 50Hz sinewave, DC–1kHz, at 50Wpc into 8 ohms (left channel blue, right red; linear frequency scale).
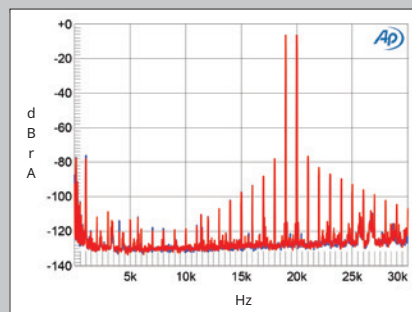

Fig.10 AVM Inspiration CS 2.3, line input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 50Wpc peak into 4 ohms (left channel blue, right red; linear frequency scale).
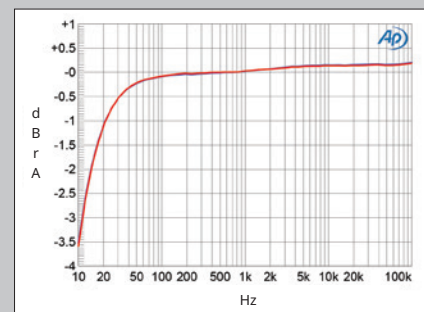

Fig.11 AVM Inspiration CS 2.3, phono input, response with RIAA correction (left channel blue, right red) (0.5dB/vertical div.).

design made for AVM by TEAC, not a cheapo mass-market DVD transport. The Inspiration CS 2.3 respects my trinity of personal listening: LP, CD, Streaming. You can also, of course, play downloads stored on a NAS or a flash drive connected to the 2.3's USB port.

Another thing that sets the CS 2.3 apart from many other streaming integrateds is the built-in phono stage. "A lot of people call their units 'all-in-ones' but either the phono stage is missing or a CD drive," Besser said. "I call them 'almost-all-in-ones.' The CS 2.3 also includes HDMI, for people who want to include TVs as well."

The phono stage for the CS 2.3 is no afterthought. It works with both MM and MC cartridges; MM loading is, of course, 47k ohms. MC loading is set via a pair of "phono" (RCA) jacks that accepts plugs for loading an MC cartridge with 100, 200, or 1000 ohms. Other values are available on request. "Little DIP switches for phono stages are junk," Besser commented. "They are built of very cheap materials, and they age rapidly, affecting resistance. And with phono stages you are dealing with very small signals." The phono stage in the CS 2.3 remains analog throughout.

Some components with built-in DACs digitize phono inputs. Not the CS 2.3: It keeps the phono signal analog throughout. That's good: I want to hear an LP played as it was meant to be played, not some ersatz virtual simulation.

In the capability and flexibility of its digital platform, the Inspiration CS 2.3 hunts with the big dogs. I asked John Woo of Bluebird Music, distributor for AVM in North America, to describe the capabilities of the AVM X-STREAM Engine, which is new for the CS 2.3 model; X-STREAM is a powerful digital processor/control-

ler, powered by an ESS 9038Q2M chip. He told me that the CS 2.3 supports hi-rez streaming up to 24/192 and DSD 256 natively. It is Roon capable and supports Tidal Connect (but with no MQA support), Spotify Connect, Qobuz, and AirPlay 2. All are accessed with the AVM RC X App. Included in the package are several "teaser" cards, for a free trial of Roon, Tidal, and Qobuz. Bluetooth is an older version: 4.2, which was introduced in late 2014. It has smaller bandwidth than more recent 5.x versions and shorter range. Supported profiles are AD2P (basic Bluetooth audio streaming) and AVRCP, which facilitates use of Bluetooth-based remote controls. Bluetooth on the CS 2.3 is best used for casual listening.

We live at a time in which software and hardware are intertwined in much hi-fi gear. "This keeps us working," Besser said. "We have a large team that has to update compatibility for iOS and Android systems. We've added two dozen new functions within the last 13 months. You have to keep track of these things, because they change every other minute. We haven't seen a day go by without some licensing-agreement change. This is a sign of the times: You have to study law to stay on top of it."

It is possible to access functions of the Inspiration CS 2.3 via the front panel, but the best (and intended) way is with the RC X App, which was a quick and easy install on my phone, downloaded from the Apple App Store. (It is also available for Android, downloaded from Google Play.) It often seems like half the consumer world is trying to get me to put things on my phone; it has become the technology fulcrum point of our era.

With the CS 2.3 hardwired and my phone connected to my network via Wi-Fi, the RC X App automatically sought a connec-

measurements, continued

phono input testing, I measured the digital inputs' behavior at the preamplifier output with the speaker outputs turned off and the volume control set to –10dB. (The preamplifier output clipped with the control set to –8dB.)

The AVM's impulse response with CD data and the reconstruction filter set to "Smooth" (fig.13) indicates that this reconstruction filter is a very short linear-phase type, with a small amount of time-symmetrical ringing on either side of the single sample at 0dBFS. The "Steep" filter was also a linear-phase type but with

more ringing. With 44.1kHz-sampled white noise (fig.14, red and magenta traces), the CS 2.3's "Smooth" filter response starts to roll off at 16kHz but doesn't reach full stop-band suppression until 28kHz. An aliased image at 25kHz of a full-scale tone at 19.1kHz (blue and cyan traces) can be seen at –27dB, though the distortion harmonics of the 19.1kHz tone are all very low in level, at close to –100dB (0.001%). By contrast, the "Steep" filter rolled off rapidly above 20kHz, reaching full stopband attenuation at 24kHz. When I examined the "Steep" filter's digital frequency response

with S/PDIF data at 44.1, 96, and 192kHz (not shown), the response at all three rates started to roll off below half of each sample rate with the expected steep slope.

Increasing the bit depth from 16 to 24 with a dithered 1kHz tone at –90dBFS lowered the noisefloor by 20dB (fig.15), meaning that the CS 2.3 offers between 18 and 19 bits' worth of resolution. With undithered data representing a tone at exactly –90.31dBFS (not shown), the three DC voltage levels described by the data were well resolved and the waveform was perfectly symmetrical. With undithered
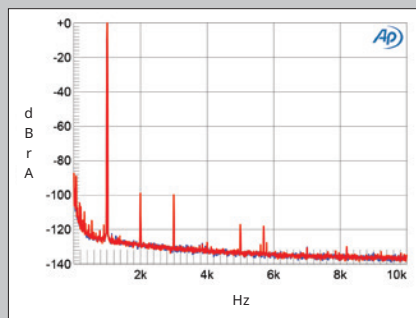
Fig.12 AVM Inspiration CS 2.3, phono input, spectrum of 1kHz sinewave, DC–10kHz, for 17.5mV input (left channel blue, right red, linear frequency scale).
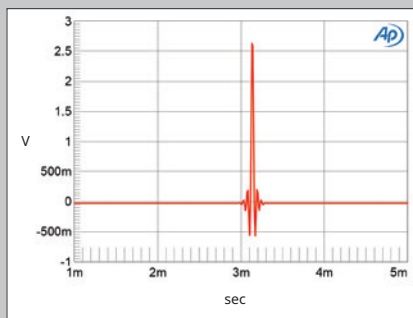
Fig.13 AVM Inspiration CS 2.3, CD data, "Smooth" filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).
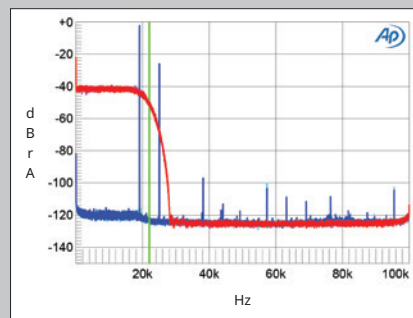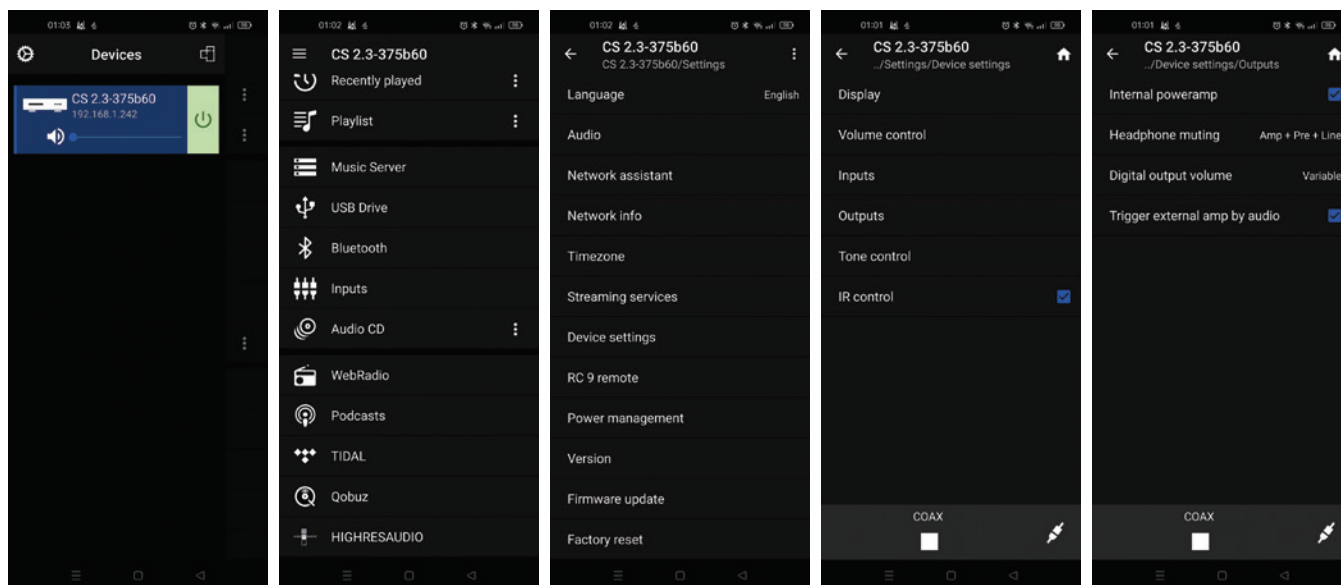
Fig.14 AVM Inspiration CS 2.3, CD data, "Smooth" filter, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

tion to the CS 2.3. When it found it, a small icon appeared, with a label highlighted in pink; the pink label indicates that the CS 2.3 is in standby mode. Tapping the icon powers up the CS 2.3, and the icon turns green. Another tap takes you to the main menu page of the RC X App, where music sources can be chosen. Hit the icon one more time to put the CS 2.3 back in standby.

I did all my listening utilizing the app. After spending some time with it, I found it intuitive and a pleasure to use. Navigating menus and submenus felt logical and appropriate—with one exception: The operating manual neglected to mention that if you hold and slide the volume slider, the volume changes are very large. If you tap left or right of the virtual knob, though, the volume changes in very small, $\frac{1}{2}$ dB increments.

Our monopoly internet provider, Spectrum (the artist formerly

measurements, continued

24-bit data, the result was a clean sinewave (also not shown).

The second-order intermodulation product at 1kHz with an equal mix of 19 and 20kHz tones with a peak level of 0dBFS lay at a very low –108dB (0.0004%, fig.16), and the higher-order products at 18kHz and 21kHz were 10dB lower in level. Peculiarly, and conflicting with the spectrum of the 19.1kHz tone shown in fig.14, no aliased images of the primary tones are present in

this graph. (Fig.14 was taken with CD data, fig.16 with optical S/PDIF data.) The AVM's rejection of word-clock jitter with 16-bit TosLink data (fig.17) was superb, with all the odd-order harmonics of the LSB-level, low-frequency squarewave at the correct levels, indicated by the sloping green line in this graph. Repeating the analysis with 16-bit CD data (not shown) gave a very similar result.

AVM's CS 2.3 amplifier offers generally

excellent measured performance, though it will probably work best with speakers that have an impedance greater than 4 ohms. The phono input offers low noise and distortion and accurate RIAA equalization; the digital inputs offer high resolution; and the CD transport offers one of the best error correction/concealment performances I have encountered. The only thing that raised my eyebrows was the digital inputs' excessive gain.—**John Atkinson**
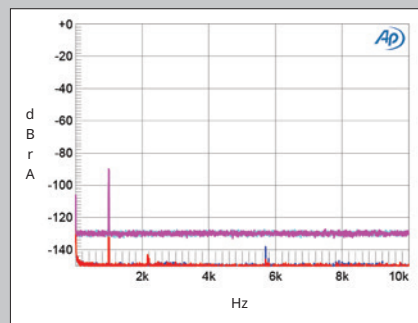

Fig.15 AVM Inspiration CS 2.3, digital input, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).
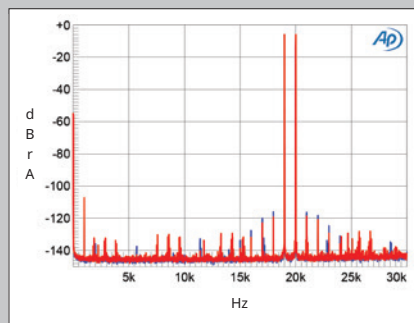
Fig.16 AVM Inspiration CS 2.3, digital input, "Steep" filter. HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS peak, sampled at 44.1kHz.
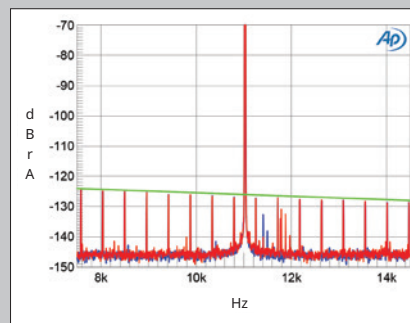

Fig.17 AVM Inspiration CS 2.3, digital input, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit TosLink data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

known as Time Warner), services our old apartment building in Manhattan. For years, I've required little of my internet connection, so I haven't paid much attention to it. Perhaps because I had unchecked all the "updates" and "offers" boxes when I signed up for my internet service, as I do with everything I subscribe to, I was unaware that my internet service was much slower than what's currently available—much slower, in fact, than what I was paying for. A service call got me a new modem and router and speeds about 10 times as fast as what I had before, for the same monthly fee.

The benefits of faster internet were obvious immediately: no gaps, no dropouts. It helped with watching movies, too. 192 kHz and multi-DSD files have been a pleasure to listen to.

Listen to this, listen to that

Some of the most fun I had listening with the new Inspiration CS 2.3 was listening to internet radio. The incorporated Airable internet radio service allows access to a huge database of online radio stations. You can find a station by typing in call letters or searching by genre or other criteria. I had not played with internet radio since the miserly Apple removed it from iTunes so that they could charge for it with Apple Music. I've missed WWOZ in New Orleans, which broadcasts the greatest roots music from roots ground zero. Or that fine classical music station, WQXR right there in New York City. What fun it was to sit in our apartment on the Upper West Side, look out the window down toward midtown, and hear a live performance at Carnegie Hall by the Cleveland Orchestra, conducted by Franz Welser-Möst. It was live all right; I even heard a cell phone ring! In addition to basic artist and title info, the display on the app lists the audio format being broadcast—for WQXR, a modest 140kbps MP3.[2] You can add any number of stations as favorites and play them with a tap on the app.

The first CD I played on the front-loading CD player was a longtime reference, *The Reiner Sound*, specifically the very fine 2001 JVC XRCD version (JVCXR-0215-2). I've used this recording for years to judge systems, and the Inspiration CS 2.3 did not disappoint. The lovely muted strings that open the album, on Ravel's *Rapsodie Espagnole*, sounded velvety and delicate, as they should. When that piece ramps up to those terrific percussion outbursts, the dynamic energy was all of a piece as heard from my little standmount Sonus Fabers, augmented by an REL subwoofer. CD playback can be controlled from the RC X App except you can only eject a CD via a button on the front panel.

I got chills while listening to a CD I hadn't heard in while, *Ronnie Earl and Friends* (Telarc CD-83537). I had the pleasure, years ago, of attending a session for this album at Bearsville Studio in Woodstock. Among the "friends" sitting in with the guitarist was Levon Helm on drums. After they had laid down a smokin' slow number, "Twenty-Five Days," Levon turned to me and said: "Love me them sweet blues." When music is reproduced with this level of quality, it's like a time machine transporting you to other moments and places.

To try out the USB-A input on the back panel, I inserted a thumb drive on which I had loaded a few test tracks. The titles came up on the RC X App; the audio format was also displayed—nice. All sounded just fine. This is not a feature I would use very often—maybe if I was carrying around a recording project on a flash drive and needed to hear it. Which could happen. In general, though, I don't "burn" or "rip" music. I "play" it, then store it on what I call "shelves" or "record racks."

However, now that I had upgraded my internet service, I could take full advantage of the Inspiration CS 2.3's ability to stream from various hi-rez music providers. Taking it to the 192/24 Qobuz limit, I listened to Alan Yoshida's 2012 remaster of the Coltrane masterpiece *Blue Train* (Blue Note BST-81577). Though not as thrilling as the recent vinyl remaster by Joe Harley and Kevin Gray, this version got my juices flowing: real air and slap from Philly Joe Jones's drums, and when the three horns start playing in unison, it was pedal to the metal time. All this with none of the clicks or dropouts that had been troubling me for too long.

I tried a couple of headphones to see how they would play with the Inspiration CS 2.3, connected to the mini-phone jack on the front panel. AVM says that the CS 2.3's headphone amp runs in class-A. Streaming jazz station KCSM in San Francisco, I listened to Ray Charles doing "How Long Has This Been Going On?" Despite the limited bandwidth—this station broadcasts on the web at just 96kbps MP3 or 64kpbs AAC—my AudioQuest Nighthawk 'phones sounded terrific. These cans are voiced to the darker side—the better to suppress any digital compression nasties—and with the CS

2 For those of you not experienced with internet radio: 140kbps MP3 is probably slightly above average for quality, but the data rate of internet radio stations is gradually improving. The very best today are true hi-rez; check out the three Mother Earth stations from Munich. As I'm writing this, their three stations (the original, which calls itself "eclectic and sources all its music from vinyl; "Instrumental"; and "Klassic") are broadcasting at lossless 24/96 FLAC.—**Jim Austin**

2.3 driving them, the presentation seemed to open up a bit, getting more detailed with a bit more air. My Sennheiser 560 S gave a less pleasant result, sounding thin.

I recently purchased, for the Apartment System, a Pro-Ject Debut Carbon EVO turntable. This was already a fine-value package, but shortly after I purchased it, distributor Fine Sounds America offered a free stylus upgrade, from the stock Sumiko Rainier a notch up the line to the Olympia stylus. Would the Inspiration CS 2.3 allow me to hear a single-grade quality change in one element of a system?

On a before/after comparison using an Albert King LP, *I'll Play the Blues for You* (Stax STS-3009), I heard a nice, if subtle, improvement in soundstage specificity and dynamic pop. The biting sting of Albert's flying V was right there, just as I recalled from hearing him play live.

A few blocks away from our apartment, on West 72nd Street, is an old book and record store that managed to weather the COVID storm, presided over by a nasty old man at a dirty old desk, selling a wonderful assortment of old LPs alongside books about music and even some sheet music and scores. New York strong!

The high point of my listening sessions (to date) with the AVM Inspiration CS 2.3 came when I brought back from this store, in fairly good condition, a copy of Ella Fitzgerald's very first LP, *Ella Sings Gershwin* (Decca DL 74451). This record was recorded in 1950, before the Norman Granz period, "with an assist from Duke Ellington." I love it when my ignorance allows me to hear things for the first time—things I missed earlier in life. Ella sounded superb.

The awards ceremony

The AVM Inspiration CS 2.3 is a delicious example of having cake and eating it. Some out-of-the-box thinking has taken shape in this

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ASSOCIATED EQUIPMENT

Analog sources Pro-Ject Debut Carbon-EVO turntable, Sumiko Rainier & Sumiko Olympia cartridge.
Digital sources Cary Audio 308T CD player, Musical Fidelity M1CDT transport.
Integrated amplifiers Peachtree Audio Nova integrated, McIntosh MA252 Tube Hybrid integrated.
Loudspeakers Sonus Faber Toy, Harbeth C7 ES-3 XD, REL T2 subwoofer.
Headphones AudioQuest Nighthawk, Sennheiser HD 560 S.
Cables Interconnects: AudioQuest Cobra & Sky. Speaker: AudioQuest Rocket 88 & Robin Hood.
Accessories Mapleshade equipment rack. IsoAcoustic Orea footers.—**Sasha Matson**

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small, attractively finished box. Designer-owner Besser is proud that many of the subcomponents for AVM are produced nearby his small German town; he told me he can literally call out the window to one of those vendors just next door. But whether someone is carrying trays of capacitors or steins of beer back and forth is less important than the quality of the resulting products. That quality is patently evident in the AVM Inspiration CS 2.3—real creative excellence. It is not inexpensive, but when you price out everything it does—DAC, streamer, CD player, line and phono preamp, amplifier, headphone amp—and how well it does it, the smallness of that number starts to impress. I'd like to give the CS 2.3 an award. Instead, I'll reward myself: I'm buying the review sample, to use in the Apartment System. *Gut gemacht*, AVM! ∎