JAZZ AT A DARK TIME

FESTIVAL BLENDS US & UKRAINIAN MUSICIANS

stereophile

ONLINE AUTHORITY:
STEREOPHILE.COM

HiFi ROSE RS520
FAST AND WELL-APPOINTED

◀ B&W 705 S3
HIGHLY RESOLVING MUSICALLY SATISFYING

▶ TW-AKUSTIC RAVEN GT2
ARISTOCRATIC AND A BLAST TO USE

▼ ANTIPODES OLADRA
MAKES GLORIOUS MUSIC

JULY 2023
$8.99 US
$10.99 Canada

ROGIER VAN BAKEL

HiFi Rose RS520

STREAMING INTEGRATED AMPLIFIER

My first car was a decrepit, mustard-yellow Peugeot 304 with a navy hood. The blue hue wasn't a fashion statement; after an accident, the previous owner had gone to a salvage yard where only a blue replacement could be procured. When he grew sick of the car—because it made him look "like a frickin' ad for Ikea"—I paid him 600 Dutch guilders for the old heap, the equivalent of about $300 US.

Nothing worked as it should. The stalk for the blinkers was missing; I substituted a screwdriver. The radio was like a wavering zombie: dead one day, sputtering to life the next. I got well acquainted with jumper cables. One day, I opened the trunk and found tiny mushrooms sprouting from the carpet.

On the plus side, I never received a speeding ticket: The engine smoked if you drove faster than 45mph, so I didn't.

Years later, when I got into hi-fi, I thought of that car and subsequent ones. What stood out to me most about high-end audio was: *separates*. Rather than gravitate toward worthy one-box solutions, audiophiles seemed obsessed with splitting things apart. They had to have a standalone power amp, preamp, sources, speakers, cables. "What if you bought a car that way?" I thought to myself. A suspension from one manufacturer, a chassis from another, wheels from a third—and yes, a used blue hood from a junkyard. Seems pretty mental. No thanks.

It's not a precise analogy, I realize. When you have to get from point A to point B, you buy a one-box automotive solution. Bolting together mismatched car parts wouldn't work at all. Audio, on the other hand, is more or less standardized. Most components are easily connected, and they work together reasonably well. Still, even if you forgo 1950s all-in-one consoles,[1] '70s receivers, and (ugh) '80s boomboxes, why can't the desire for great sound be sated with a single-box fix, just like transportation? Just please give me something that works better than my French jalopy did.

Everything you need (almost)

For roughly half a decade, we've seen a spate of products that do precisely that. The Naim Uniti Atom is a great example; so are the T+A Cala and NAD's Masters Series M10 and M33. Everything you need in one box—just add speakers.[2]

Korea's HiFi Rose recently joined the fray with the RS520. Conceptually, it's the love child of HiFi Rose's RA180 GaN FET class-D integrated amplifier [redacted][3] and the RS250A network streamer [redacted]. Combining a well-thought-out streaming device, DAC, preamp, and amplifier, the unit is as versatile and full-featured as you could wish. Okay, not quite: The RS520 has no silver-disc transport, no headphone output, no subwoofer outputs, no balanced ins or outs, no phono stage. With those caveats out of the way, let's take a look at the laundry list of technologies and features that RS520 buyers *do* get.

Milled from a block of aluminum, the RS520's casework (in silver or black) is classy and understated. Both the left and right flanks have 11 shallow ridges that improve heat dissipation. On top, to each side of the word "Rose" engraved in the center, is a cluster of three silver-rimmed vents that further help with cooling. Also on the top, near the front edge, are four narrow silver buttons, each about an inch long. From the left, the first three are Mute/Unmute, Volume Down, and Volume Up. The fourth control is a power button that, with a long press, lets you turn off just the screen while keeping the component fully active.

Located on the right of the rear panel, the binding posts are spaced far enough apart to accommodate large spades. Moving to the left, we see TosLink and RCA S/PDIF ports (inputs and outputs), an eARC input, an RJ45 connection, a USB-B input, an analog-input RCA stereo pair, and three USB 3.0 A-style inputs. (The middle one is reserved for the included Wi-Fi/Bluetooth antenna; the other two can be used to attach storage.) Rounding out the connections are an HDMI output, RCAs for the preamp out, the usual trigger and infrared control ports, a ground terminal, and a 15A IEC socket.

Inside, HiFi Rose says, the analog and digital circuits are mounted on separate boards to prevent digital noise from affecting analog signals.

The bottom of a stereo component rarely warrants attention, but

SPECIFICATIONS

Description Solid state Roon Ready streamer, DAC, and GaN FET–based class-D integrated amplifier with a 12.6" TFT LCD touchscreen (1920 × 510 pixel resolution). DAC section utilizes ESS ES9038PRO chip. Custom Android 7.1 OS. Infrared remote control included. Dedicated phone app available for download. Frequency range: 20Hz–90kHz. Continuous power: (at 1% THD) 250W into 8 ohms (24dBW) and 4 ohms (21dBW). Dynamic power: (at 1% THD): 248W into 8 ohms (24dBW), 500W into 4 ohms (24dBW), 428W into 2 ohms (20.3dBW), 235W into 1 ohm (14.7dBW). Input impedance: 100k ohms; output impedance: 0.05 ohms.
Dimensions 13.6" × 5" × 12.9". Weight: 18lb
Serial number of units reviewed KSL207AB00004 (auditioned), EBK302CB000118 (measured).
Price [redacted]. Approximate number of US dealers: 150. Also sold online. Warranty: Two years.
Manufacturer HiFi Rose, 11F, 932 Yangjae-daero, Songpa-gu, Seoul, South Korea. Tel: 82-1899-6042. Web: hifiroseUSA.com.
US distributor: MoFi Distribution, 1881 W. Bryn Mawr Ave., Chicago, IL 60660. Tel: (312) 841-4087. Web: mofidistribution.com.

here there's an empty bay on the bottom for a 2.5" solid state drive (not included).

I've saved the best for last. The fascia is entirely taken up by the biggest display I've ever seen on a stereo component—apart, that is, from HiFi Rose's own RS150B streamer ( ), which is even wider than the one on the RS520. After you subtract the 0.6" bezel, the 520's screen measures a whopping 12.25" × 3.5". The screen is the component's main attraction in terms of shelf appeal.

The competition has taken notice. At a recent audio show, the rep for a leading brand of streamers told me that he regards the RS520 as a "big disruptor" due to its aggressive price and expansive screen. Suddenly, other streamers' displays seem puny by comparison.

As friends dropped by to see my newly built listening room and hang out and play some favorite recordings, every single one commented on the HiFi Rose. They approached, swiped, tapped, grinned. And why not? I mean, you can set the jumbo LED display to mimic a Nixie clock[4] or the fascia of a full-size FM tuner. When streaming audio, a couple of taps on the screen produce virtual VU meters—your choice of designs and colors.[5] Perhaps it's a little silly, but it's thoroughly charming. I've admired many audio products that passed through my home, but I don't think I've ever had as much fun with one.[6] "That thing is cool!" was my visitors' shared verdict.

I did encounter one naysayer, though not in my home. "Who needs an iPad stapled to their amp?", a gentleman on an online audio forum bristled. It was pointed out to the sourpuss that the RS520's screen can be turned off, as I often did; I like listening in the dark.

Jon Derda of MoFi, HiFi Rose's distributor, believes the two companies have a winner on their hands. "In addition to sound quality, there are two differentiators that jump out" about the RS520, he wrote in an email. "The first is the front panel. Being able to read the name of the song from across the room is a practical benefit

1 See tinyurl.com/ybkdzs7r.

2 Or not: I like the Sonus Faber Omnia and love the Naim Mu-so; both have speakers built in.

3 Although the two components look nothing at all alike; see stereophile.com/content/hifi-rose-ra180-integrated-amplifier.

4 See en.wikipedia.org/wiki/Nixie_tube.

5 Those colors no longer include "McIntosh blue," one of the 520's original VU meter presets. It seems that some folks in Binghamton objected.

6 Until I read Rogier's description during editing, I'd thought of this design—of the RS520 and the two streamers in the HiFi Rose lineup—as rather boring. Now I know I was wrong. Thinking also of the very different but extraordinary-looking RS180, it becomes clear that hi-fi–rack wow factor is a big part of the HiFi Rose approach.**—Jim Austin**

DAVID DUPUY

that components with small screens can't provide."

No kidding. The RS520 is the first audio component with a screen that lets me easily read the song title and artist's name from my listening position, 13–14' from my gear. Just a quick glance; no squinting.

The second big distinction, Derda says, is the power of the amplifier: a specified 250Wpc into 8 ohms or 4 ohms. "Many components in the all-in-one category deliver 50 to 100 watts per channel. The amp in the RS520 can drive a much wider range of loudspeakers than the other one-box solutions."

He's not wrong, although I'll note that the $5999 NAD M33, which I reviewed for a different publication, comes close; it's specified to produce 200W of Purifi Eigentakt power per channel with an 8 ohm load. The NAD drove the several pairs of speakers I threw at it with exemplary punch and clarity. But sure: My Naim Uniti Atom streamer amplifier, which I love for its beautiful design and pristine sound, has a harder time with some less-sensitive speakers due to its much lower power output, specified as 40Wpc into 8 ohms. The T+A Cala, at 50Wpc[7], is on the modest side as well.

Channeling a Swiss Army knife

The RS520 is Roon Ready and can handle every digital format I'm familiar with (AAC, AIFF, ALAC, FLAC, MP3, MQA, OGG, WAV, WMA) plus some I'd never even heard of. It supports playback of PCM sources up to 32/768 and DSD sources up to DSD512. The DAC is built around the excellent ES9038PRO Sabre chip, which claims –122dB THD+N and a dynamic range of 140dB. It's the same digital-to-analog tech you'll find in the RS150B, the company's flagship streamer.

Power comes from a GaN FET amplifier section that runs in class-D—although the Korean team, with a nod to the analog-ish sonics of the RS520, likes to refer to it as "Class-AD." GaN stands for gallium nitride. In semiconductors, the material has some major advantages over silicon, as JMu explained in her *Stereophile* review

7 T+A specs say 2 × 100W, but that's into a 4 ohm load. Apples to apples.

MEASUREMENTS

When I unpacked the RS520 sample reviewed by RvB, I heard something metallic rattling around inside the amplifier. The nut holding one of the speaker binding posts to the printed circuit board on the back panel had come undone. I found the binding post inside the shipping box, and when I removed the top cover, I found the nut inside the amplifier. I reattached the binding post, but when I removed the top panel, the two ribbon cables that connect it to the main circuit board detached. As hard as I tried, I couldn't manage to reattach these cables. I requested a new sample of the RS520, which was promptly supplied. I measured serial number EBK302CB000118.

I performed the measurements using my Audio Precision SYS2722 system.[1] As the HiFi Rose 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 AUX-0025 passive auxiliary low-pass filter. (The AUX-0025 mitigates noise above 80kHz and eliminates noise above 200kHz.) Without the filter, 760mV of ultrasonic noise was present at the left channel's loudspeaker terminals, 860mV at the right channel's, both with a center frequency of 570kHz. After a few hours of testing, the amplifier's top panel was warm, at 98.4°F/36.9°C.

I left the amplifier's Software Volume Control turned off for all the measurements. The Pre output level was set to its default value. Looking first at the single-ended analog line input, with the HiFi Rose's volume control set to its maximum—the control operates in accurate 0.5dB steps—the voltage gain at 1kHz into 8 ohms measured 28.5dB from the speaker terminals and 1.7dB from the preamplifier output. The line input preserved absolute polarity (ie, was noninverting) from both output types, and the input impedance was low, at close to 3.3k ohms across the audioband. (The specified input impedance is 100k ohms.)

The preamplifier output impedance was 302 ohms from 20Hz to 20kHz; the impedance at the speaker terminals was a low 0.11 ohm at 20Hz and 1kHz, rising to 0.4 ohm at 20kHz. (These values include the series resistance of 6' of spaced-pair

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

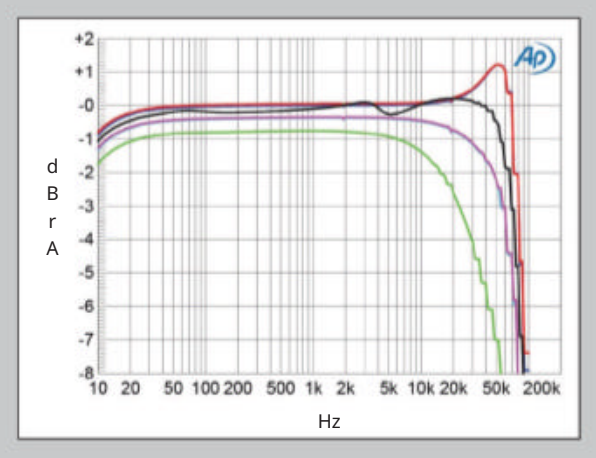

Fig.1 HiFi Rose RS520, line input, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (green) (1dB/vertical div.).

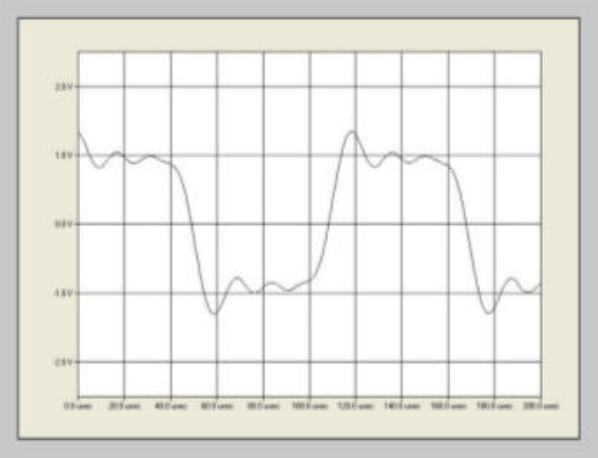

Fig.2 HiFi Rose RS520, line input, small-signal, 1kHz squarewave into 8 ohms.

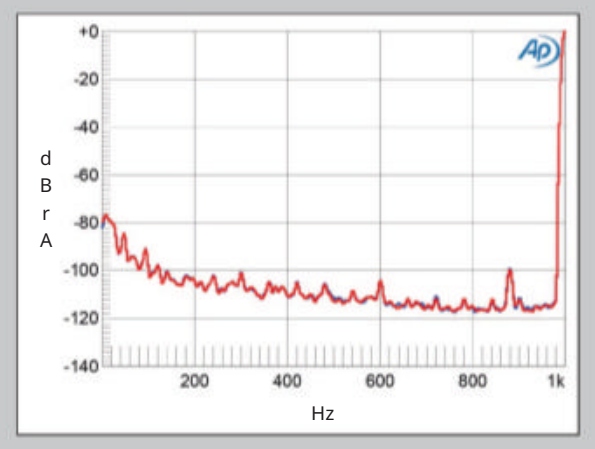

Fig.3 HiFi Rose RS520, line input, spectrum of 1kHz sinewave, DC–1kHz, at 1W into 8 ohms with volume control set to the maximum (left channel blue, right red) (linear frequency scale).

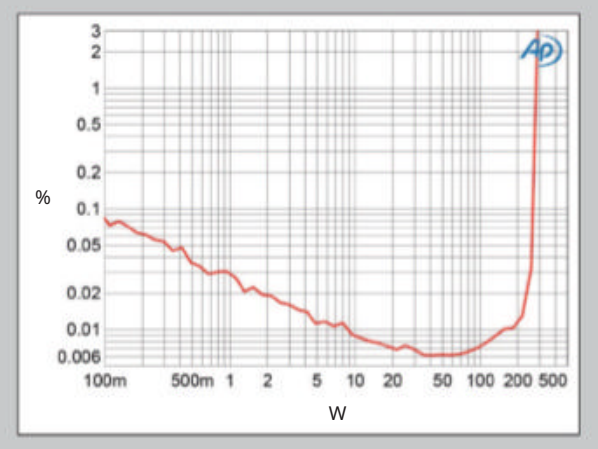

Fig.4 HiFi Rose RS520, line input, THD+N (%) vs 1kHz continuous output power into 8 ohms.

of HiFi Rose's RA180 amplifier: "GaN FETs respond faster to transients, dynamic swings, etc., with less overshoot and shorter recovery time. The result is faster switching times (with less 'dead time') and more precise switching with less ringing, distortion, and EMI (electromagnetic interference). Class-D designs use negative feedback to offset such distortion; silicon-based amps need quite a lot of it to perform at their best. Starting with more precise, faster amplification means that less feedback is needed." Sonically, it should all add up to "less harshness and more smoothness, improved detail, and a more neutral presentation."

After you press the 520's power button and wait about 25s for bootup to complete, you're greeted with a row of icons that give you access to your music. The 520 offers AirPlay 2, Spotify Connect, Tidal, Qobuz, Apple Music, and much more. Swipe left or right on the front panel, and you'll find icons that unlock Rose-

measurements, continued

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, though the output rolled off earlier in the top octave with low-impedance loads (fig.1, cyan, magenta, and green traces) than it did into 8 ohms (fig.1, blue and red traces). A slight rise in response can be seen above the audioband into 8 ohms, which correlates with an overshoot and ringing on the waveform's leading edges with the RS520's reproduction of a 10kHz squarewave into this load (fig.2). Fig.1 was taken with the volume control set to its maximum; the superb channel matching was preserved at lower settings of the control.

Channel separation above 2kHz was okay, at >60dB in both directions, but decreased to 50dB at 100Hz and below. With the Audio Precision ultrasonic filter, the RS520's line inputs shorted to ground, and with the volume control set to the maximum, the wideband, unweighted signal/noise ratio (ref. 2.83V into 8 ohms) measured 54.4dB in both channels. Restricting the measurement bandwidth to 22kHz increased the ratio to 76dB, and an A-weighting filter increased it further, to 84.5dB. Spectral analysis of the HiFi Rose's low-frequency noisefloor (fig.3) revealed no AC power-line–related spuriae, though the 1kHz tone has a sideband at 880Hz (1000Hz–120Hz). This graph was taken with the volume control set to its maximum, but the spectrum didn't change significantly with the volume reduced by 12dB.

The RS520 is specified as delivering a maximum output power of 250Wpc into both 8 ohms and 4 ohms (24dBW and 21dBW, respectively). With our usual definition of clipping—when the THD+N reaches 1%—and with both channels driven, the RS520 clipped at 275Wpc into 8 ohms (24.4dBW, fig.4). The downward slope below 50W in this graph indicates that the reading is dominated by noise, with distortion rising above the noisefloor at higher powers. I couldn't test the clipping power into 4 ohms, as the amplifier went into protection at 357Wpc (22.55dBW, fig.5), well above the rated power. The distortion

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

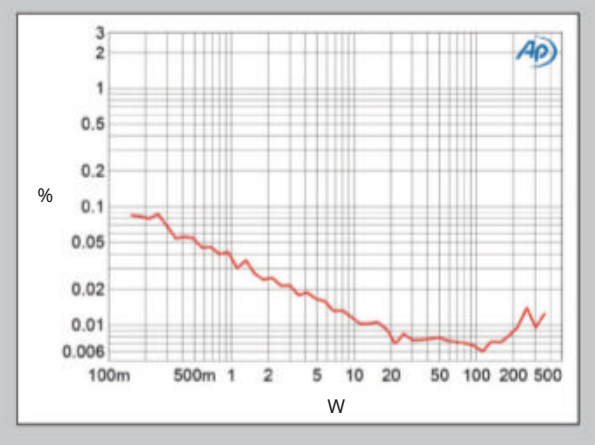

Fig.5 HiFi Rose RS520, line input, THD+N (%) vs 1kHz continuous output power into 4 ohms.

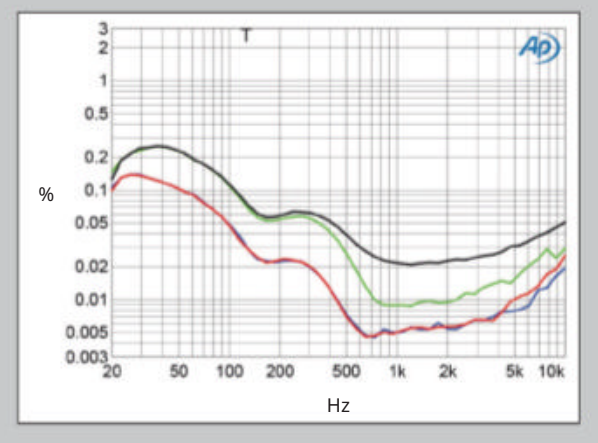

Fig.6 HiFi Rose RS520, THD+N (%) vs frequency at 12.67V into: 8 ohms (left channel blue, right red), and 4 ohms (left green, right gray).

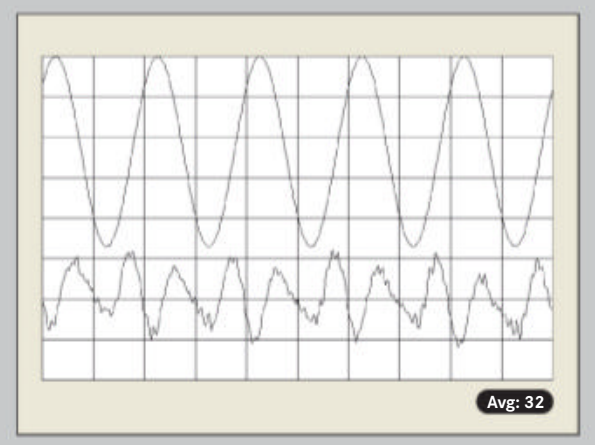

Fig.7 HiFi Rose RS520, line input, 1kHz waveform at 20W into 8 ohms, 0.006% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

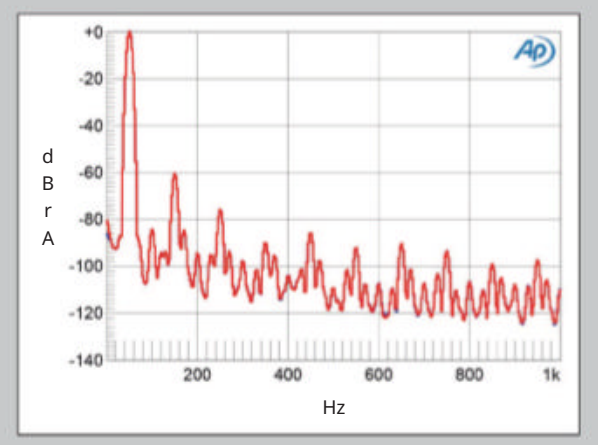

Fig.8 HiFi Rose RS520, line input, spectrum of 50Hz sinewave, DC–1kHz, at 20Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

specific content. RoseHome shows tracks that the algorithm thinks you'll like, plus a list of recordings you recently played. RoseRadio lets you access internet music stations around the world. RoseFM transforms the RS520's front panel into a near-photorealistic rendition of a 1970s-style tuner, complete with a ribbed horizontal frequency dial that's completely functional (but without the tactile feedback, natch).

RoseTube is a music-oriented, ad-free YouTube portal. That's right: You can play video on the 520's screen. Then again, why would you want to? Better to route the HDMI output to a big-screen, hi-def TV, should your listening room have one.

When you swipe on the HiFi Rose's inertial-scrolling display, the graphics roll by as smoothly as on any late-model tablet. No surprise: HiFi Rose is a division of Citech, a Seoul-based company that's a leader in ticket-issuing machines and information kiosks.

Traces of the RS520's Koreanness surfaced occasionally. Tap on

measurements, continued

levels at 12.67V, which is equivalent to 20W into 8 ohms and 40W into 4 ohms (fig.6), were very low above 500Hz. (To avoid having the measured percentage corrupted by high-frequency noise, even with the auxiliary AP filter, I used a brickwall low-pass filter set to a 40kHz passband, which is why this graph only extends to 10kHz.) However, the THD+N rose below that frequency, exceeding 0.1% (–60dB) in the low bass.

The distortion signature appears to be primarily second harmonic in nature at 1kHz (fig.7) and third harmonic at 50Hz (fig.8). As shown in fig.6, the distortion was much higher with the 50Hz signal than it was with the 1kHz signal (fig.9). Note the sidebands of the spectral spike at 1kHz in fig.9 at ±120Hz. I experimented with the grounding between the RS520 and the Audio Precision, including connecting a wire between the ground terminal on the amplifier's rear panel and the analyzer's chassis ground, but I could not eliminate these sidebands. Intermodulation distortion was very low (fig.10), the difference product at 1kHz lying at –94dB (0.002%), the higher-order products at 18kHz and 21kHz at –79dB (0.01%).

Turning to the RS520's digital inputs, I used the Audio Precision's optical and coaxial S/PDIF outputs and sent test signals to the amplifier via Ethernet from Roon and by USB from my MacBook Pro. The RS520's S/PDIF inputs locked to datastreams with sample rates up to 192kHz. Apple's USB Prober app identified the HiFi Rose as "RS520-DAC" and showed that the USB port operates in the optimal isochronous asynchronous mode. Apple's AudioMIDI utility indicated that the RS520 accepts 16- and 32-bit integer data sampled at all rates from 44.1kHz to 768kHz via USB.

With the volume control set to its maximum, a 1kHz digital signal at –20dBFS resulted in an output level of 4.52V into 8 ohms from the loudspeaker output, which is 0.3dB below the clipping voltage into this load with a 0dBFS signal. The HiFi Rose's gain architecture is well-arranged. Nevertheless, I turned off the speaker outputs for the digital input testing, examining the signal at the Pre outputs. Data at 0dBFS gave a maximum level of 2.08V from the preamplifier output.

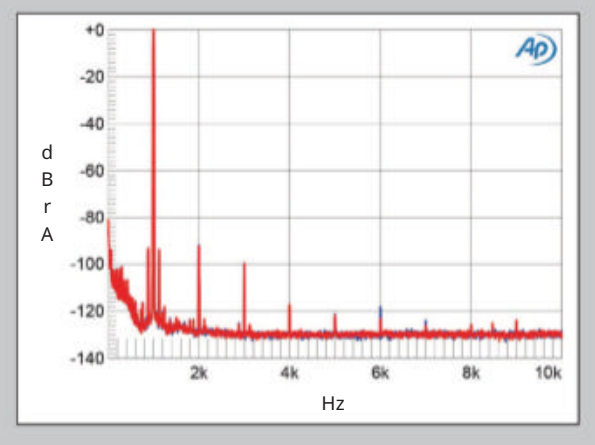

Fig.9 HiFi Rose RS520, line input, spectrum of 1kHz sinewave, DC–1kHz, at 20Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

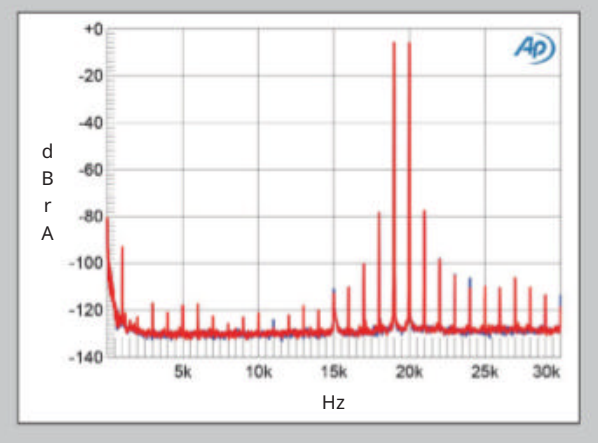

Fig.10 HiFi Rose RS520, line input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 50Wpc peak into 8 ohms (left channel blue, right red; linear frequency scale).

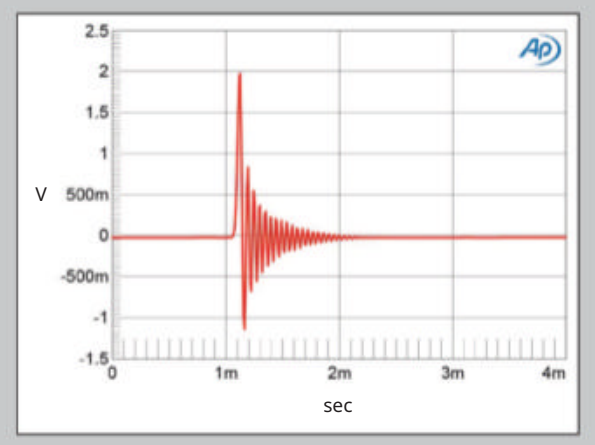

Fig.11 HiFi Rose RS520, digital input, "Minimum Phase Fast Roll-off" filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

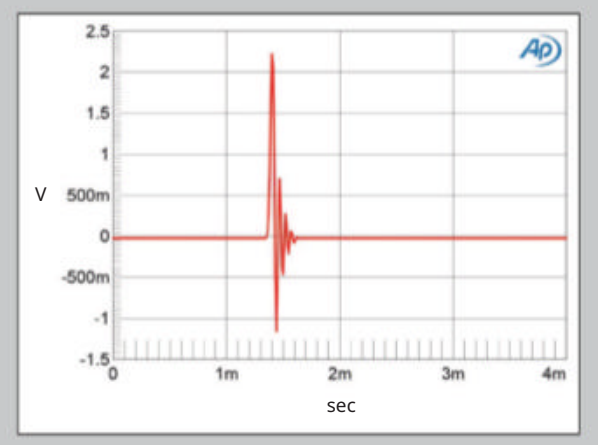

Fig.12 HiFi Rose RS520, digital input, "Minimum Phase Slow Roll-off" filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

the RosePodcast icon and then on Genres, and you get a screenful of Hangul characters (the Korean alphabet). RoseFM attempts to pull in Korean stations as the factory default, although changing that to the US or another country is trivial. One of the icons on the display is for launching Bugs, an unfortunately named pay-to-play Asian streaming service headquartered in South Korea. Tapping the icon results in a message that says "It is not a service area."

Ah, language quirks. At times, the HiFi Rose RS520 reminded me of the Russian translator in the movie *Tetris*, who tries out her best English on an American businessman in Moscow. "Do you require succor?" she chirps, offering her assistance. "Esteemed to meet you!" We know what she means even if the choice of words isn't impeccable.

Because HiFi Rose is an engineering-centric company,[8] niceties like translation and spelling sometimes seem to get short shrift. On the RS520, linguistic quirks were never particularly enigmatic, but perfection is a ways off. When connecting to Bluetooth, the message you get is the slightly off-kilter "Execute [Bluetooth] to search for available devices." The screen that lets you choose among three font sizes for streaming music says, by way of instruction, "Enlarge a Playback information." Even the company's official English-language website[9] states, "Before the sudden change, the tool until yesterday is meaningless." Jon Derda says HiFi Rose has been "making small changes with each iteration of [the RS520's] firmware,[10] to Americanize the product further." Importantly, the 64-page product manual is written in rock-solid English, no complaints.

8 The numbers can fluctuate, but US distributor Jon Derda told me that the last employee headcount he's aware of was 27, "with only two people handling sales and marketing, the rest being engineers."

9 See eng.hifirose.com.

10 Updates are frequent, and they are downloaded and installed automatically via the network.

measurements, continued

With S/PDIF and Ethernet data, the HiFi Rose's reconstruction filter can be set to one of seven types with the front-panel's touchscreen. With the filter set to "Minimum Phase Fast Roll-off," which was both the default filter and the only filter operating with USB data, the impulse response with 44.1kHz data (fig.11) was typical of a long minimum-phase type, with all the ringing following the single sample at 0dBFS. As expected, the "Minimum Phase Slow Roll-off" filter was a shorter minimum-phase type (fig.12). The "Apodizing Fast Roll-off" (fig.13), "Linear Phase Fast Roll-off," and "Brickwall" filters were all long linear-phase types, with equal amounts of ringing before and after the single high sample. The "Linear Phase Slow Roll-off" filter's impulse response was shorter, and the "Corrected Minimum Phase Fast Roll-off" (fig. 14) filter was the familiar hybrid type seen in our reviews of other digital processors that use the ESS Sabre chip set.[3]

With 44.1kHz-sampled white noise (fig.15, red and magenta traces), the RS520's "Minimum Phase Fast Roll-off" filter response starts to roll off above 20kHz but doesn't reach full stop-band suppression until 44.1kHz. Aliased images at 25kHz and 63.2kHz of a full-scale tone at 19.1kHz (blue and cyan traces) can be seen at –47dB, though the distortion harmonics of the 19.1kHz tone are all very low in level, at close to –80dB (0.01%). The "Linear Phase Fast Roll-off" filter behaved identically, but the "Corrected Minimum Phase Fast Roll-off," "Apodizing," and "Brickwall" filters all had a sharply defined null at half the sample rate (fig.16). The slow linear-phase and minimum-phase filters both rolled off slowly above the audioband, with a null at 44.1kHz (not shown). With these two filters, the rolloff actually started slightly lower than the Nyquist frequency (half the sample rate). At 44.1kHz, for example, the rolloff started at 16kHz.

Increasing the bit depth from 16 to 24 with a dithered 1kHz tone at –90dBFS lowered the noisefloor by 20dB (fig.17), meaning that the RS520's digital inputs offer between 19 and 20 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 (though overlaid with high-frequency noise).

The second-order intermodulation

3 See, for example, fig.4 at stereophile.com/content/topping-dm7-8-channel-da-processor-measurements.

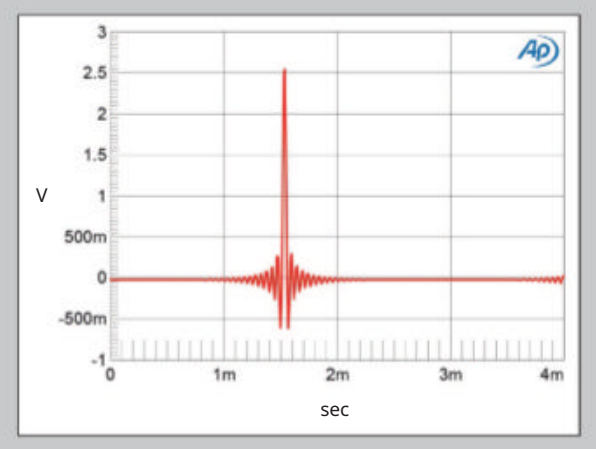

Fig.13 HiFi Rose RS520, digital input, "Apodizing Fast Roll-off" filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

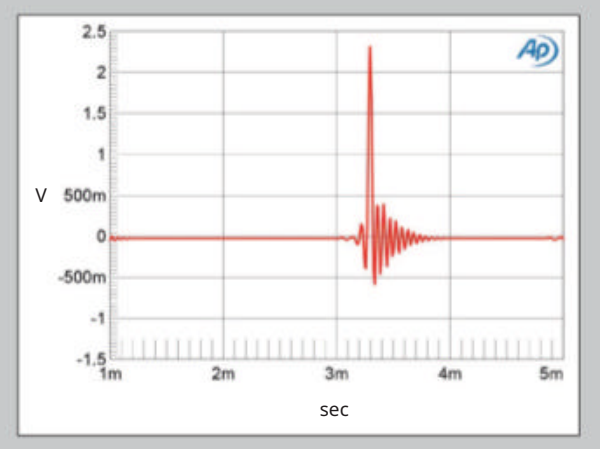

Fig.14 HiFi Rose RS520, digital input, "Corrected Minimum Phase Fast Roll-off" filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

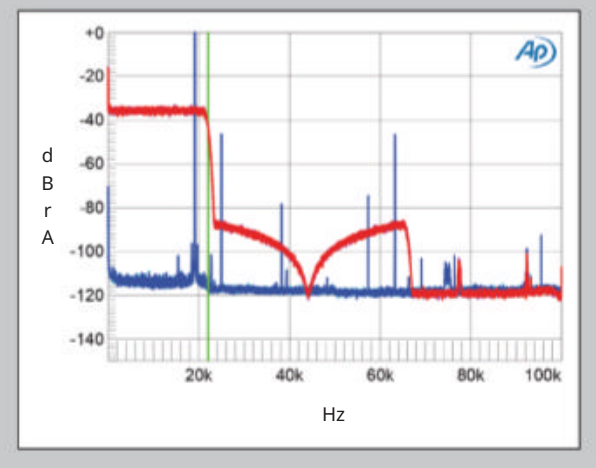

Fig.15 HiFi Rose RS520, digital input, "Minimum Phase Slow Roll-off" filter, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

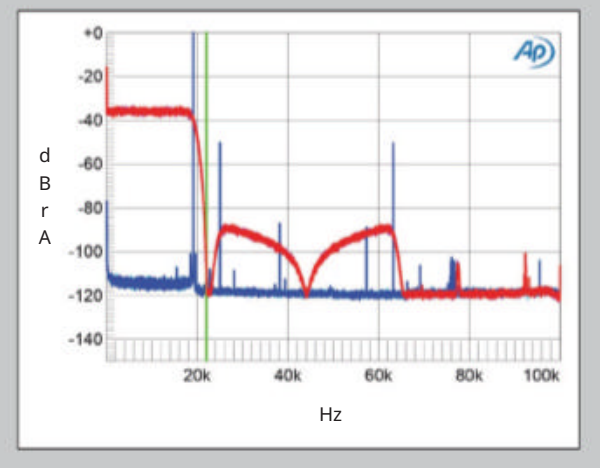

Fig.16 HiFi Rose RS520, digital input, "Corrected Minimum Phase Fast Roll-off" filter, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

I'm all ears

Surprisingly, break-in wasn't necessary. Although I'd received a factory-fresh RS520, its sound didn't change over the three-plus months I spent with the unit. For convenience, I kept it powered on almost the whole time (though I turned off the screen a lot, including at bedtime). But when I did shut everything down for a spell, then returned to listening, I detected no difference between the RS520 cold and after it had warmed up. This may be one of the advantages of well-built class-D amplification, as class-A and class-AB amps tend to sound better at full operating temperature. The HiFi Rose RS520 vaults to that point straight away.

Extended kneeling in front of a component isn't my idea of a good time, so after 15 minutes of setup and half an hour of playing around with the front-panel menus and controls, I interacted with the unit via the excellent, drama-free Rose HiFi smartphone app. The dedicated remote control wasn't for me, as its volume up and down buttons dramatically overshot the intended stopping point: If I wanted to turn down the volume from 70 to 50, and I took my thumb off the button the moment it reached that number, the volume continued downward, stopping at 35 or even 30. It worked the same in the opposite direction but with scarier results: Unintentionally raising the volume to 95 or higher—practically full-blast—is friendly to neither speakers nor ears.[11] Thankfully, the app had no such issues, and of course, Roon doesn't either.

I was impressed when I hooked the RS520 up to my Tekton Moabs ($4500/pair), then my Focal Scala Utopia EVOs ($53,000/pair), and finally the Raidho TD3.8s ($119,000/pair) I have in for review. With each combination, there was weight, control, authority, clarity, and palpability. I heard sweet detail up top that didn't become brittle even on borderline sibilant recordings, such as Emmylou Harris's "Deeper Well" (24/44.1 FLAC, Nonesuch/Tidal). In the delicate *pas de deux* between each set of speakers and the streaming amp, the HiFi Rose got out of the way and let the speakers take the principal role, allowing each to express its own personality.

Chet Baker's *Live in Paris 1960-1963* (24/96 WAV) isn't an audiophile-grade recording. Ray Mosca's drums have a lamentable cardboard-box quality, and he sounds as if he's using knitting

ASSOCIATED EQUIPMENT

Digital sources 16" MacBook Pro M1 Max running Roon 2.0. Roon ROCK (Lenovo ThinkCentre). Auralic Vega DAC. Naim Uniti Atom controlled via iPad Pro and iPhone 14 Pro Max.
Preamplifiers Benchmark HPA4, Naim Uniti Atom.
Power amplifiers Krell FPB 200c (recapped). PrimaLuna EVO 400 integrated amp with Tung-Sol KT150 and Gold Lion platinum 12AU7 tubes. Anthem STR integrated.
Loudspeakers Tekton Moab, Focal Scala Utopia EVO, Raidho TD3.8.
Subwoofers Two SVS 3000 Micro, Hsu VTF-2 Mk5.
Cables AudioQuest, Blue Jeans, Clarus, Nordost, RSX, Viborg Audio.
Accessories Core Power Technologies Equi-Core 1800 MkII and Deep-Core 1800 power conditioners. Townshend Seismic Isolation Podiums for speakers and power amplifiers.
Listening room Special-built 21' × 15' space with ceilings 10' at the walls sloping up to 16' for a total volume about 4000ft³. Double-thick drywall over Rockwool and mass-loaded vinyl. Hardwood floor over plywood, rubber, and a concrete slab. 12' × 15' wool rug on a thick pad. Acoustic treatments include four bass traps, two skyline diffusers, and a dozen wall- and ceiling-mounted absorption panels. Dedicated powerline and 20A outlets.—**Rogier van Bakel**

measurements, continued

product at 1kHz with an equal mix of 19 and 20kHz tones with a peak level of 0dBFS lay at a very low –100dB (0.001%, fig.18), and the higher-order products at 18kHz and 21kHz were almost 10dB lower in level. Though this graph was taken with a slow rolloff reconstruction filter, the aliased products at 24.1kHz and 25.1kHz are suppressed by more than 30dB.

The HiFi Rose's rejection of word-clock jitter with 16-bit data was identical with USB, Ethernet, and S/PDIF data. While the odd-order harmonics of the LSB-level, low-frequency squarewave were all at the correct levels, indicated by the sloping green line in fig.19, the spectral spike that represents the high-level tone at one-quarter the sample rate has relatively strong sidebands at ±578Hz, of unknown origin.

HiFi Rose's RS520 amplifier offers generally excellent measured performance, though its class-D output stage has a higher level of ultrasonic noise than I usually find with such designs.—**John Atkinson**

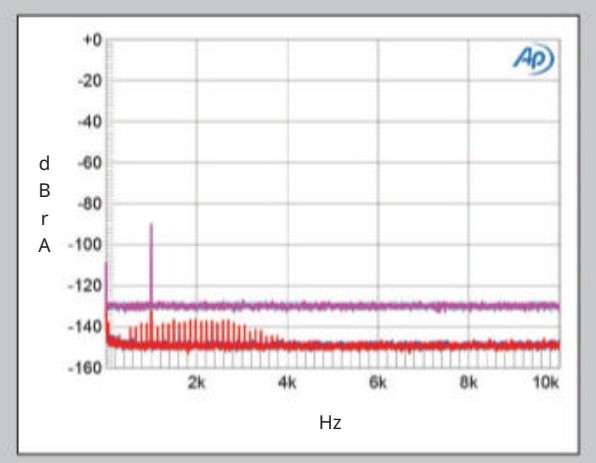

Fig.17 HiFi Rose RS520, digital input, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

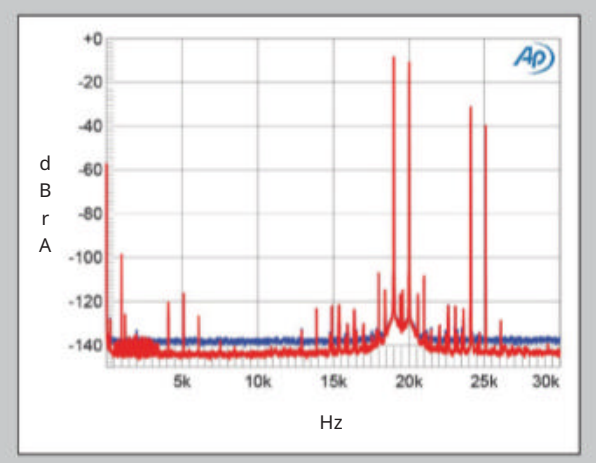

Fig.18 HiFi Rose RS520, digital input, "Minimum Phase Slow Roll-off" filter. HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS peak, sampled at 44.1kHz.

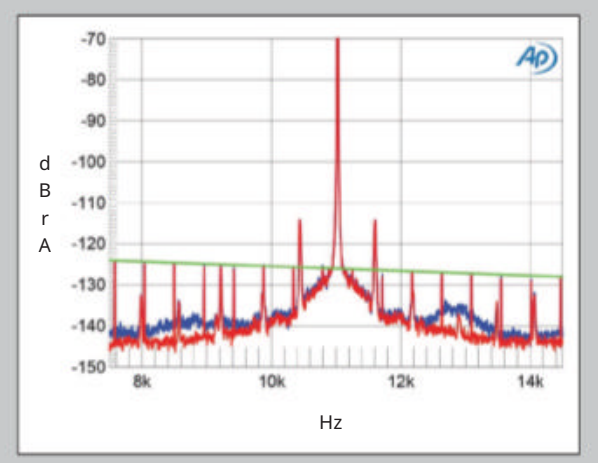

Fig.19 HiFi Rose RS520, digital input, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit TosLink data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

needles instead of wooden sticks. The trumpet is another story. Baker's beautiful, burnished sound comes through gloriously, each note suffused with ache and melancholy even on the tracks that would seem upbeat if you were reading the sheet music. To listen to him play this material is to go on a trip of love and loss. The HiFi Rose did a first-rate job of rendering it down to the tiniest timbral details.

Next, on Two Feet's "Love Is a Bitch" (16/44.1 FLAC, Casual Majestic/Qobuz) and Me'shell Ndegéocello's *Peace Beyond Passion* (16/44.1 FLAC, Maverick/Qobuz), I learned that the RS520 is undaunted by a good bottom-octave challenge, producing taut, grippy bass.

The RS520 strikes a smart balance between liquidity and detail. Its sonics tip ever so slightly forward, but that's what makes it revealing. Speakers that tilt heavily analytical might be best avoided as partners—unless you pull down the top end a touch with a parametric equalizer like the one built into Roon. (You'll also find an equalizer in the 520, with five frequency bands, adjustable Q, eight factory presets, and three memory banks to save your settings.)

On almost every track, the soundstage was wide and convincing, not only left to right but also front to back. On David Bowie's "Bring Me the Disco King," a track from *Reality* (16/44.1 MQA, ISO/Tidal), I could hear the snare drum precisely placed 5–6' to the Thin White Duke's back left and well behind him. The ping-pong panning effects and assorted soundstage frippery on Bear Project's "Punch," from the gorgeously trippy ambient album OHM (16/44.1 FLAC, NL/Qobuz), were a delight to follow, appearing as they did all over the room. Cerebral electronica doesn't get much better than this.

This is the end

I loved my time with the RS520; this Rose is blessedly free of thorns. It's a serious piece of cutting-edge technology, uniquely outfitted with a user interface that's infused with playfulness. The Rose is free of glare, grain, and tizziness, unlike most class-D amplifiers of 10–12 years ago. Audiophiles of a certain vintage tend to swear by class-A or class-AB amps, but their knees may be jerking. D may have once stood for "Don't"; now, perhaps we can settle on "Delectable."

Returning to automotive terms, the HiFi Rose is a fast, impressively appointed sports car for the price of a Volkswagen Golf. *Fahrvergnügen* indeed! ■

11 Inexplicably, two years earlier, I'd had almost the same problem with the NAD Masters M33 and its volume control. Maybe I have a poltergeist who dislikes powerful streamer/amps ... or who is very hard of hearing.