

HERB REICHERT

Hegel Music Systems H160

INTEGRATED AMPLIFIER



For decades, I read the British and American audio magazines, and I pretty much believed everything written therein—with one exception. The equipment reviews published in *Stereo Review* had an off-puttingly disingenuous quality. I learned a lot from the magazine's reviews of recordings and loudspeakers, but every time senior editor Julian Hirsch wrote that any amp with sufficiently high power, low measured distortion, and high damping factor would sound the same as any other with similar qualifications, I felt estranged from my favorite hobby. *Stereo Review's* arrogance came off as duplicitous and self-serving. The magazine seemed committed to stamping out all forms of individualized audio connoisseurship.

While *Stereo Review* was making such claims, I owned Dynaco A50 loudspeakers and several appropriately powered tubed and solid-state amplifiers. Every time I swapped amps, the sound of my E. Power Biggs and Jascha Heifetz records changed in unobtrusive and unmistakable ways.

When I noticed this, I would shout, "Julian! Can't you hear this? Stop listening with your oscilloscope!"

Eventually, I realized that each of us could hear only what we know to listen for.

Thereafter, every time I met a loudspeaker designer, I was compelled to ask: "What amplifiers did you use to voice your speakers? What power amps do you recommend to your customers?"

Mostly, I'd get dodgy, Julian Hirsch-type answers: "Well, my speaker will work with any amp of sufficiently high power and current capability."

Lately, I've met a few designers who at first say exactly that—but who then, when pressed, look me in the eye, lean close, and whisper, "But we mainly used a Hegel! [wink-wink]" I've also been noticing, at audio shows, a lot of excellent-sounding rooms sporting Hegel amps. Clearly, more than a few speaker designers and show exhibitors think these Norwegian-made amps sound different enough

SPECIFICATIONS

Description Integrated amplifier. Analog inputs: one pair balanced (XLR), one pair unbalanced (RCA), one pair home theater (RCA). Digital inputs: 1 coaxial, 3 optical, 1 USB, 1 Ethernet (RJ45). Analog outputs (line level): fixed (RCA), variable (RCA). Headphone output: 6.3mm jack (front). Maximum

output power: 150Wpc into 8 ohms (21.75dBW), 250Wpc into 4 ohms (21dBW). Maximum headphone output power, 270mWpc into 64 ohms. Frequency range: 5Hz–100kHz. S/N ratio: >100dB (no reference level given). Channel separation: >100dB. THD: <0.005%, 1kHz at 50W into 8 ohms.

IMD: <0.01%, 19kHz+20kHz. Damping factor: >1000.

Dimensions 16.9" (430mm) W by 4.7" (120mm) H by 16.1" (410mm) D. Shipping weight: 41.9 lbs (19kg).

Serial number of unit reviewed H160-53A587.

Price \$3500. Approximate number of dealers: >65. Warranty: 3 years, parts &

labor.

Manufacturer Hegel Music Systems, PO Box 2, Torshov, NO-0412 Oslo, Norway. Tel: (47) 22-60-56-60. Fax: (47) 22-69-91-56. US distributor: Hegel Music Systems USA, Springfield, MA 01060. Tel: (413) 224-2480. Web: www.hegel.com.

to give them an advantage over their competitors.

Curious

I went online and read every Hegel review I could find. Each seemed to describe what I'd heard in those Hegel-equipped rooms at audio shows: Hegel amplifiers make music sound more visceral and well proportioned than other amps in their price range. In my experience, every amp-speaker combination imposes a unique character on the music. Every combination feels, to some degree, harder or softer, or denser or leaner, or darker or lighter, or stronger or weaker than some other combo. But recently, whenever I heard speakers powered by a Hegel, I noticed something else—something almost indescribable that I'd never experienced before. The Hegels appeared to have a way of “fixing” something—something I hadn't even realized had been wrong with most other amps I've enjoyed. I became so intrigued by my evolving Hegel experiences that I contacted Eileen Gosvig, the charming and knowledgeable national sales manager for Hegel Music Systems USA, to obtain a review sample of the new H160 integrated amplifier (\$3500).

A few weeks later, Gosvig brought to my steampunk Bed-Stuy man cave a Hegel H160, the also-knowledgeable Anders Ertzeid (global sales manager), and the suave Harry Bromer (Bach Sales Group). I kept them busy with nervous Herbchat, organic grapes, and Jansberg cheese as I hooked up their very solid-feeling integrated.

Description

While trying to be a good host and connect wires at the

same time, I discovered the Hegel H160's unusual selection of inputs. “We designed an integrated with a broader set of connections than any other amplifier on the market,” Hegel states on their website.

This had me scratching my head, because the first thing I wanted to do was connect two turntables. But the H160 does not include a phono stage or an option for one, and its “broader set of connections” includes only *one* analog (RCA) input and one balanced (XLR) analog input. I have at least 10 phono stages and three turntables, but none has symmetrical inputs or XLR outputs. The only other analog (RCA) input is for home theater, which bypasses the volume control. And when I saw that the H160 had *six* digital inputs—one coaxial/RCA, three optical TosLink/EIAJ, one USB, and one LAN-RJ45 (for streaming music from devices with DLNA; wireless streaming is also available via Apple AirPlay)—I felt obsolete and disconnected. And where's my Mono switch? And my Balance control? I pouted despondently and stamped my little foot.

My self-esteem improved when I scrutinized the H160's front panel, which is handsome and understated in a timelessly masculine way. It has only a rotary selector switch, a blue-lit display, and a rotary volume control with a sexy, silk-suit feel.

Today, many solid-state amplifiers are variations on class-D output topologies; the Hegel H160 is more old school. Instead of using the now-ubiquitous Hypex output module, Bent Holter—Hegel's founder, CEO, and chief designer—opted for discrete bipolar transistors operated in class-A/B. Plus, Holter added a “new” twist in Hegel's

MEASUREMENTS

I measured the Hegel H160 using my recently recalibrated Audio Precision SYS2722 system (see www.ap.com, and the January 2008 “As We See It” at www.stereophile.com/content/measurements-maps-precision). Before performing any measurements on an amplifier, I run it for an hour at one-third its specified maximum power, which, thermally, is the worst case for an amplifier with a class-B or -AB output stage. I cut short this preconditioning

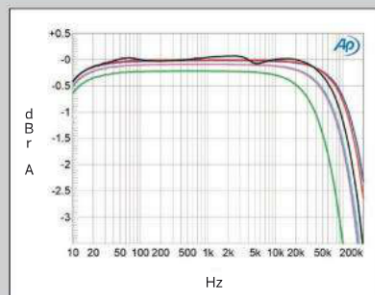


Fig.1 Hegel H160, volume control set to maximum, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (green) (0.5dB/vertical div.).

of the H160 after 20 minutes, however, as the THD+noise, which had been just 0.00315% with the amplifier cold, had risen to 0.83%. The chassis was mildly warm, at 92.2°F (33.4°C), but the temperature of the internal heatsinks must have been much higher. Allowing the amplifier to cool brought back correct operation, with very low distortion, but this is not an amplifier suitable for sustained high-power use, such as providing the music for a rambunctious party.

The volume control offers 99 steps, with “0” being full mute, activated by a relay. However, only alternate settings

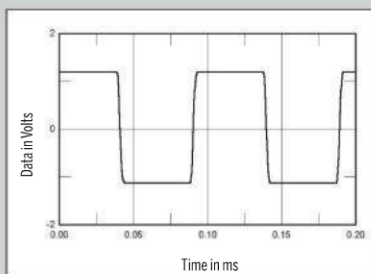


Fig.2 Hegel H160, small-signal, 10kHz squarewave into 8 ohms.

offered a reduction in gain; eg, both “99” and “98” offered maximum gain, “97” and “96” produced a reduction in level of -1dB, “95” and “94” a reduction of -2dB, and so on. The maximum voltage gain, measured at the speaker terminals, was a modest 31.6dB into 8 ohms for both the balanced and unbalanced inputs, while the fixed-gain, line-level outputs offered unity gain, with a source impedance of 1k ohms across the audioband. All outputs preserved absolute polarity (ie, were non-inverting). The unbalanced input impedance was a usefully high 47k ohms at low and middle frequencies, this dropping inconsequentially to 34k ohms at 20kHz. The balanced input impedance, however, was on the low side, at 9.4k ohms, at all audio frequencies.

The output impedance was very low over most of the audioband, at 0.07 ohm, rising to 0.1 ohm at 20kHz. (Both figures include 6' of speaker cable.) As a result, the modulation of the H160's frequency response with our standard simulated loudspeaker (fig.1, gray trace) was minimal. The Hegel offers a wide small-signal bandwidth,

DualAmp Technology. He separates the H160's voltage-gain duties from its current-delivery tasks by generating the amp's 32dB of voltage gain entirely in the first stage. Current delivery is then accomplished separately, in the Hegel's unity-gain output stage. Enhancing that topology, the H160 uses separate, specialized power supplies for each stage. Hegel calls this strategy its DualPower Technology. (*Dette er nytt?*)

I have always believed that the main problem with traditional amplifier measurements was simple: Music is neither a sine wave nor a square wave. The whack of a snare drum or the pluck of a bass string generates complex, wildly irregular waveforms with insanely intricate shifts in power and voltage levels. Bent Holter agrees, and thinks he has addressed this issue of "waveform asymmetry" in his Hegel amplifiers.

Simply stated, all tubed or solid-state (push-pull) output stages are statically balanced using sine wave inputs until they are pushing and pulling in relatively equal ways. But according to Holter, "the main problem of using push-pull output stages in high-power audio amplifiers is that



The H160's front panel is handsome and understated.

the music signal is dynamic and asymmetrical most of the time. These kinds of dynamic signals make the temperature of the transistor silicon go up and down with the signal. Unfortunately, the current/voltage transfer curve of the power transistor changes when the temperature changes. Because of this, there will be a kind of memory effect where the instantaneous and recent dynamic historical signal will decide what is the actual temperature point of the transistor silicon. Because the temperature will change the transfer curve of the transistor, the transistor will always move

away from any static matched transfer curve. . . . Hegel amplifiers use a unique and patented technology called SoundEngine. This new amplifier topology solves the problems of dynamic crossover distortion."

As I typed all that, my mind kept singing, "and it don't mean a thing if it ain't got that swing!"

Listening

Alone, sequestered in my *chambre secrète*, I began my Hegel reviewing experience with flutist Gastone Tassinari and

measurements, continued

its output into 8 ohms being down by 3dB at greater than the 200kHz limit of this graph, which resulted in a superbly accurate shape to a 10kHz square wave, with very short risetimes and no sign of overshoot or ringing (fig.2). The traces in fig.1 were taken with the balanced input and the volume control set to its maximum. Commendably, there was no change in the frequency response and channel balance for different settings of the volume control, or with the unbalanced inputs.

Channel separation was good rather than great, at >80dB below 2kHz but

60dB at 20kHz. The unweighted, wide-band signal/noise ratio, taken with the unbalanced inputs shorted but the volume control set to its maximum—very much the worst-case situation—was good, at 76.3dB in the left channel and 77.5dB in the right, ref. 1W into 8 ohms, these respectively improving to 92.7 and 91.3dB when A-weighted. The primary source of noise was the presence of power-supply-related components at the even- and odd-order harmonics of 60Hz, though all of these lay at or below -94dB ref. 1W into 8 ohms.

Specified to produce 150Wpc into

8 ohms (21.75dBW) or 250Wpc into 4 ohms (21dBW), the H160 clipped (1% THD+N) at 175Wpc into 8 ohms (22.4dBW, fig.3) and 270Wpc into 4 ohms (21.3dBW, fig.4). The down-sloping shape of the traces in these two graphs implies that the actual distortion remains below the noise floor at levels below 50W or so. I therefore measured how the percentage of THD+N changed with frequency at a reasonably high level, 9V, equivalent to 10W into 8 ohms and 20W into 4 ohms. The results are shown in fig.5: the right channel (red and magenta)

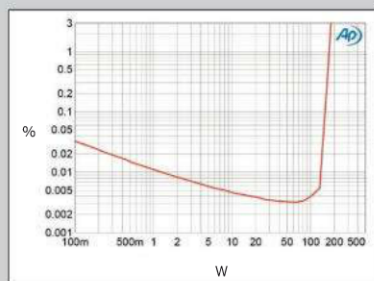


Fig.3 Hegel H160, distortion (%) vs 1kHz continuous output power into 8 ohms.

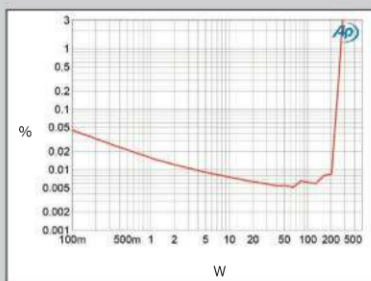


Fig.4 Hegel H160, distortion (%) vs 1kHz continuous output power into 4 ohms.

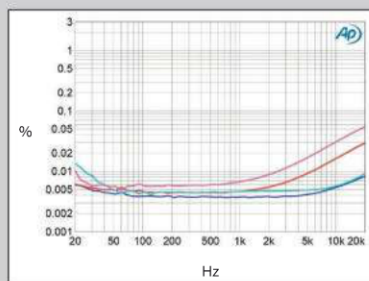


Fig.5 Hegel H160, THD+N (%) vs frequency at 9V into: 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta).

I Musici di Roma's recording of Vivaldi's beguiling Four Concertos for Flute, Strings, and Continuo in d, Op.10 (LP, Philips 835005). This mesmerizing recording never fails to transport me to the exotic corners of my imagination. Even with the not-yet-broken-in H160, spatial cues, atmosphere, and instrumental tone were such that all I could do was smile and dream.

Because I've been reviewing mostly class-D amplifiers and the Hegel is a more traditional class-A/B bipolar type, I was curious about any potential audible differences. All of those digital amps have driven low-impedance speakers with gratifying authority, but I've harbored suspicions about their capabilities into speakers of higher impedance—such as my 15-ohm Rogers and Falcon LS3/5As and 10-ohm DeVore Fidelity Orangutan O/93s. Sometimes, the class-D amps have sounded somewhat flat or slightly gray into these high-impedance loads. But now, after several weeks of listening with the Hegel, I can confidently say that it is the most vigorous- and supple-sounding amp I have used with the DeVores. And through the LS3/5As, the H160 breathes fire with dragon-like force.

REMEMBERING: The best thing about buying old records is the rediscovery of forgotten experiences from the past. One such moment was finding David Byrne's songs from the 1981 Broadway production of *The Catherine Wheel* (LP, Warner Bros. 3645). This demanding recording reminded me of being pulled into the *chambre ardente* of the Winter Garden Theatre. It made me close my eyes and see Twyla

Tharp's dancers spinning fiendishly on the breaking wheel of torturous execution. I played this record through the Orangutan O/93s and the new Falcon LS3/5As (made in Oxford, UK). The effect with both speakers was delirious and intoxicating. The Falcons projected a soundstage with holographic images that made me exclaim "Wow!" over and over. The O/93s played Byrne's voice—"I got my mojo workin' / I got the back door open / I got the screen door open / Aieeeee!"—in the most perfectly toned and provocative way. I'm listening to *The Catherine Wheel* for the tenth time now, and all I can say is, I'm fine, this is wonderful, and I'm going to step away from the typewriter so I can go over and experience Byrne's "Big Blue Plymouth (Eyes Wide Open)" and "Light Bath" with a full-on, completely focused mind.

Recorded music that feels stunning and tangibly alive is always a big turn-on—but it mostly happens only with certain enchanted LPs played through uniquely magical systems. I'm experiencing that stunning magic right now with Byrne's voice, the Soundsmith Carmen cartridge, the Acoustic Signature Wow XL turntable, the LFD phono stage, the Hegel H160, and the DeVore O/93s. But it's not only the gear I'm using. When David Byrne gets it all fully wound up and sprung out, as he does on this record, *no one* can touch his rocking soul—not even Jerry Lee Lewis.

I can't imagine wanting or needing more from a hi-fi.

LISTENING TO CDS: The next disc I spun was silver: Navajo-Ute flute virtuoso R. Carlos Nakai's *Island of Bows*,

measurements, continued

traces) is not quite as linear as the left (blue, cyan), particularly in the top two audio octaves. However, the distortion remains very low across the audioband.

The distortion signature in the midband is predominantly the third harmonic (fig.6)—I had to average 64 captures to reveal the waveform of the spurious with the fundamental tone notched out. (Every time the number of captures is doubled, the level of the noise in the graph is reduced by 3dB.) This graph was taken from the left channel's output; the second harmonic was highest in the right channel (fig.7), though at -90dB ref. 50W into 8 ohms

(0.003%), high is not really the appropriate adjective. Intermodulation distortion (fig.8) was similarly very low.

Turning to the H160's digital inputs: With the volume control set to its maximum, digital data at -12dBFS gave rise to a level of 24.5V into 8 ohms (equivalent to 75W) from the speaker outputs, which suggests that the amplifier at full volume will clip with data at -6dBFS. Fortunately, this will never happen outside the test lab, but I measured the digital-domain performance at the fixed-level line outputs with the speaker outputs muted, to avoid over-

loading the amplifier's output stage. Data at 0dBFS resulted in an analog level of 2.53V at the line-level outputs.

I didn't test the H160's AirPlay input. The coaxial and optical S/PDIF inputs locked to datastreams with sample rates ranging from 44.1 to 192kHz. With the USB input fed data from my MacBook Pro running on battery power, Apple's USB Prober utility reported the product string as "DigiHug USB Audio" from "GFEC ASSP," though the AudioMIDI utility identified the Hegel as "TE7022 Audio w/ SPDIF." This implies that the H160 uses the Tenor USB receiver chip, which was confirmed by

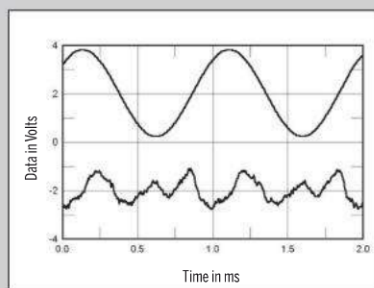


Fig.6 Hegel H160, 1kHz waveform at 20W into 4 ohms, 0.0049% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

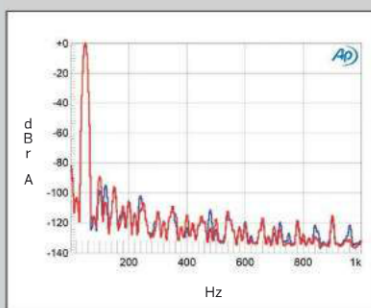


Fig.7 Hegel H160, spectrum of 50Hz sine wave, DC-1kHz, at 50W into 8 ohms (linear frequency scale).

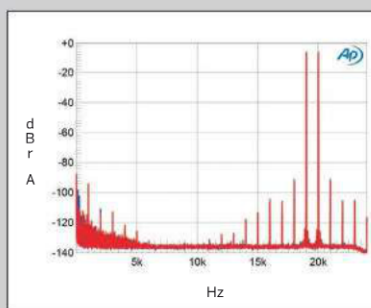


Fig.8 Hegel H160, HF intermodulation spectrum, DC-30kHz, 19+20kHz at 50W peak into 8 ohms (linear frequency scale).

with Japanese traditional-instrument masters Oki Kano on *ainu* and *tonkori*, Shonosuke Ohkura on *kotsuzumi*, and the Japanese folk ensemble Wind Travelin' Band featuring Hiroko Okani on *shamisen*, percussion, and vocals (CD, Canyon CR-7018). The liner notes say this recording is about our "shared journey to the Morning Star." It is also about the august R.C. Nakai embracing another antique folk culture from seven time zones away. The sound of the Hegel H160's DAC, fed data by my Puresound A-8000 CD player, reproducing "Cloud Temple" and "Night Forest" was big, open, supremely airy, and highly precise—in a way that honored the animistic spirit of this meditative music.

I used to disparagingly call her "Shave Head," but now I'm more loving and respectful. Singer-songwriter Sinéad O'Connor's superstrange reggae recording of 2005, *Throw Down Your Arms* (CD, Rocket Science 107134), is always in my "Need to Study" pile of CDs. To shift gears and re-contact with my own forgotten anime, I played her angel-voiced a cappella rendition of Burning Spear's classic "Jah Nuh Dead," followed by the thumping "Marcus Garvey."

With the Hegel, my experience of O'Connor's sincere

A full complement of digital inputs but a restricted number of analog inputs.

Even with the not-yet-broken-in H160, spatial cues, atmosphere, and instrumental tone were such that all I could do was smile and dream.

voice was one of purity and unadorned richness. The H160 generated a full palette of subtle feminine tones. Of course, when I finished with these appealing (but slightly rapid) covers, I had to play Burning Spear's more authentic and übermasculine "Marcus Garvey" (12" 45rpm EP, Island 12 IS 332-A). Irie, Bredren and Sistren! I played this powerful track via the Falcon LS3/5As, the Morel Octave 6s, and the DeVore O/93s. Through each pair of speakers, the structural balance between the visceral reggae bass sounds and the ganja-stained vocals was striking in its naturalness. Playing this recording caused me to realize: this natural timbral and structural "balance" was surely a big part of

measurements, continued

the fact that the Hegel's USB input will not accept data sampled at 88.2kHz, though it does accept 96kHz data. USB Prober also indicated that the H160's USB port operates in the isochronous adaptive mode, although, as you'll see later, this does not result in compromised jitter rejection.

The impulse response with 44.1kHz data (fig.9) reveals that the H160's digital reconstruction filter is a conventional time-symmetrical type, with a rapid rolloff above the Nyquist fre-

quency for 44.1kHz data, this indicated in fig.10 by the vertical green line at 22.05kHz. The red and magenta traces in this graph, taken with 44.1kHz-sampled white noise at -4dBFS, reveal that the rolloff has reached the stopband noise floor by 25kHz, the frequency of the aliasing image of a full-scale tone at 19.1kHz (blue and cyan traces). The harmonics of this 19.1kHz tone are all very low in level. Fig.11 shows a more conventional manner of presenting digital-domain frequency response,

with S/PDIF data sampled at 44.1kHz (cyan and magenta traces), 96kHz (green, gray), and 192kHz (blue, red). All three pairs of traces feature a slight rise in response in the top audio octave, reaching +0.75dB at 40kHz with the higher sample rates; peculiarly, the response with 192kHz data is no more extended than with 96kHz data.

Channel separation for the digital inputs was >100dB below 600Hz, decreasing to 67dB at 20kHz. Fig.12 reveals that the H160's noise floor

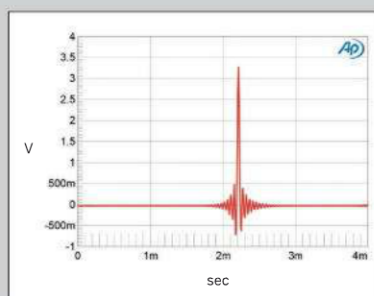


Fig.9 Hegel H160, line output, impulse response at 44.1kHz (4ms time window).

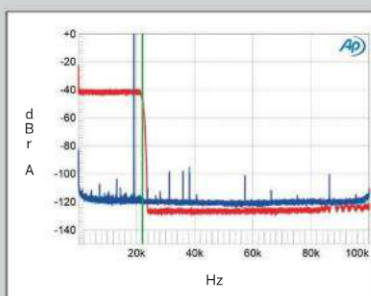


Fig.10 Hegel H160, line output, wideband spectrum of white noise at -4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

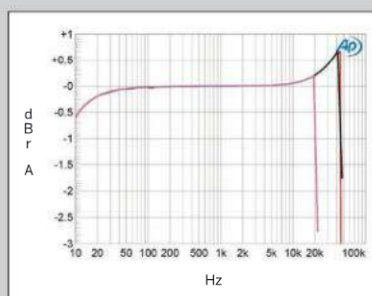


Fig.11 Hegel H160, line output, frequency response at -12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel cyan, right magenta), 96kHz (left green, right gray), 192kHz (left blue, right red) (0.5dB/vertical div.).

what I imagined the Hegel amps were “fixing.”

HEADPHONES: I’ve come to realize that listening to music via high-quality headphones offers several important advantages over loudspeakers screeching from the floor. First: Headphones enable me to better focus on the song itself, its lyrics, and, surprisingly, on the poetic intentions that generated the lyrics. I can listen more deeply into the song. All of my life, I’ve paid little attention to the actual words sung on records. I preferred to observe and ponder the gestalt of the entire song at once. But my attitudes are evolving, and I’m discovering that headphones are the perfect doorway into the myriad verbal intimacies hidden in every recording.

The H160 is the first Hegel to have a headphone output, and, as in most integrations, its headphone “amp” is not really a discrete or separate amplifier, but a voltage divider appended to the H160’s output stage. According to Anders Ertzeid, the circuitry around this divider is “tweaked to have extremely low noise and good power into difficult loads.”

Stepping as far away from O’Connor’s faux reggae as possibly could, I used the excellent AKG K812 and Grado RS-1 headphones to enjoy Lucinda Williams’s newest, *Down Where the Spirit Meets the Bone* (CD, Highway 20 H2 001; see Fred Mills’s “Records to Die For” in the February 2015 issue). I’m crazy for Williams’s whistly burnt face and drawling, hypertextured singing; “Am thaa’s the way

ASSOCIATED EQUIPMENT

Analog Sources Acoustic Signature Wow XL, Pioneer PLX-1000, VPI Traveler turntables; Grado M+ Mono, Ortofon 2M Black, Soundsmith Carmen, Zu Audio DL-103 cartridges.

Digital Sources Puresound A-8000 CD player; Halide HD, Line Magnetic LM 502CA DACs.

Preamplification Blue Horizon BN:09-11-009, LFD, Schiit Mani, Soundsmith MMP3 phono stages.

Integrated Amplifiers Line Magnetic LM518 1A, Rogue Audio Sphinx, Simaudio Moon Neo 340i.

Headphone Amplifier Schiit Asgard.

Loudspeakers DeVore Fidelity Orangentan O/93, Falcon and Rogers LS3/5As, KEF LS50, Morel Octave 6.

Headphones AKG K812, Audio-Technica ATH-M50x, Grado RS-1.

Cables Interconnect: AudioQuest Cinnamon & Big Sur & Golden Gate, Auditorium 23, Kimber Kable Silver Streak. Speaker: AudioQuest Type 4, Auditorium 23, Kimber Kable 8TC. AC: Manufacturers’ own.

Accessories Sound Anchor stands, Hunt EDA Mk.6 record brush, Dr. Feickert Analogue Universal Protractor.

—Herb Reichert

measurements, continued

drops by up to 18dB when the bit depth is increased from 16 to 24 with a dithered 1kHz tone at -90dBFS, which implies resolution of almost 19 bits, which is excellent. However, an odd modulation of the noise floor is evident in the low treble with 24-bit data in this graph (blue and red traces). Nevertheless, the Hegel’s reproduction of an undithered 16-bit sinewave at exactly -90.31dBFS (fig.13) was superb, with the three DC voltage levels described by the data readily resolved, while undithered 24-bit data gave a clean sinewave (not shown). Figs. 12 and 13 were taken with S/PDIF data; repeating

the tests with USB data gave identical results, though I had to make sure that the bit depth was correctly set to “24-bit integer” with the AudioMIDI utility to get the maximum resolution with 24-bit files.

Despite its USB input operating in the isochronous adaptive mode, the H160 offered excellent rejection of wordclock jitter via USB, and the S/PDIF inputs were equally good. With 16-bit J-Test data (not shown), all the odd-order harmonics of the LSB-level, low-frequency squarewave were at or close to their correct levels, and no other sidebands were evident around

the high-level tone at one-quarter the sample rate. With 24-bit J-Test data (fig.14), no sidebands are visible, and the noise floor is clean and free from spuriae.

Hegel’s H160 integrated amplifier is a well-engineered powerhouse, though owners should make sure it is well ventilated if they want to play music at sustained high levels. Its digital/analog circuitry is workmanlike rather than the state of the art, but a standalone digital processor offering better performance than this is going to cost as least as much as the Hegel’s \$3500.

—John Atkinson

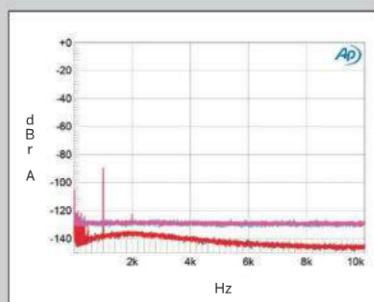


Fig.12 Hegel H160, line output, spectrum with noise and spuriae of dithered 1kHz tone at -90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

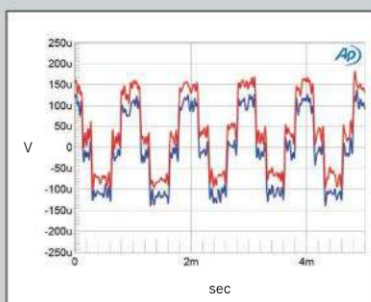


Fig.13 Hegel H160, line output, waveform of undithered 1kHz sinewave at -90.31dBFS, 16-bit data (left channel blue, right red).

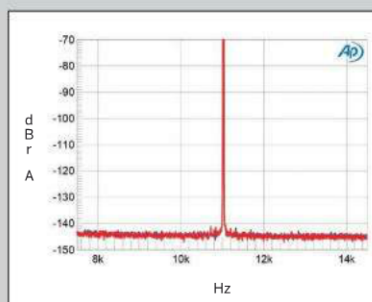


Fig.14 Hegel H160, line output, high-resolution jitter spectrum of analog output signal, 11.025kHz at -6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 24-bit data from AP SYS2722 via TosLink (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ± 3.5 kHz.

wee do things in Wes' Memphis." The Hegel's layered resolution let her twanging voice dig so deeply into my psyche that, after only two songs, I felt oversaturated—as if I'd been exposed to something radioactive. From the H160's headphone output, I could not only hear every stretched and bent word, I could sense why she'd written it.

For comparison, I played *Down Where the Spirit Meets the Bone* again, this time using my Halide HD DAC and Schiit Asgard headphone amp. The Halide-Asgard combo was more liquid, more colorful, less hi-fi sounding than the Hegel, but it seemed also to skim and stick to the surface of Williams's songs; the H160 let me dig deeper into her artistic intent.

BACK TO THE DEVORE ORANGUTANS: The voice of British folksinger Rachel Unthank was surely touched by the divine. On her album with the Winterset, *The Bairs* (CD, RealWorld USCDR W 158 884108), she and her sister Becky Unthank sing and tap their feet on a wooden floor as Belinda O'Hooley accompanies them on piano and Niopha Keegan's fiddle electrifies the room. This record revealed every good thing about the Hegel and its exceptional DAC. The scale and tone of the piano were full and viscerally real. The soundscape and imaging were half the joy of song. Most important, the H160 allowed these women's voices to inspire love, tears, and Gaelic reveries.

Conclusion

When I listen to a component I'm reviewing, I aim to stay mindful, but not so analytical that I suppress my feelings or intuition. I never want my audio prejudices to trump my curiosity. I do my best to report my pleasures and my

disappointments—not my opinions. I believe it is my job to find worthy components and report to readers about their fundamental character. My reviews should reveal a component's potential for generating musical enjoyment in a wide range of audio systems. Most important, I need always to remember that my taste in music playback is unlikely to be the same as yours.

My experiences with Hegel Music Systems' H160 made all of the above easy. I used it with a wide range of loudspeakers, recordings, and source components in order to boil this sturdy integrated down to its essential base character, which sounded to me ardent and visceral, but never overblown or unrefined. It didn't play as captivatingly or as carefully as my Line Magnetics LM518 1A amplifier, but its sound wasn't too dark or too light or unfun in any way. On a scale of thick to thin, the H160 tended toward the corporal—but in a very appealing manner. It wasn't fast or slow. Its way with rhythm and tempo was unerringly natural and enjoyable. Forced to pronounce a negative, I'd say that the H160 could *occasionally* seem a little hesitant off the starting line, and a smidgen less invisible than the very best.

What the Hegel H160 did better than any but the absolute best amps I have heard was to generate correct-feeling tonal and structural *balances* in every loudspeaker I connected it to. If I were a nascent speaker designer en route to the Consumer Electronics Show in hopes of finding dealers, or a blossoming audiophile exasperated by all the advertising hype and reviewer hyperbole, I'd be studying Hegel's website now. The H160 is ready to make a diverse lot of audiophiles very happy—maybe even Class A in *Stereophile's* "Recommended Components" happy! ■



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