

Hegel Reference H590

The Norwegian brand's latest amp is not just its most powerful integrated, but comes complete with network audio capability. Is this the ultimate one-box amp solution?
Review: **Andrew Everard** Lab: **Paul Miller**

Obviously not afraid of a spot of (Russell?) crowing, Oslo-based Hegel describes its new Reference H590 integrated amp, just going on sale at £9000, as 'Master and Commander'. Apparently it's 'A master at musicality' and 'The commander of any set of speakers'. Mind you, you might be tempted to forgive the company for its exuberance – after all, the new arrival is something of a monster, standing an AV-receiver-challenging 17.1cm tall, tipping the scales at 22kg and delivering over 300W per channel. Well, 301W a side actually, according to Hegel, making it at least 50% more powerful than its previous top integrated, the H360.

SPECIAL SAUCE

OK, so the price is a bit of a jaw-dropper, given that the company built its reputation for highly competitive tickets thanks to its policy of distributing direct from Norway. Also, to say the front panel is an exercise in understatement is something of an understatement in itself, but it doesn't take long with this big amp to realise there's some very special stuff going on here.

Yes, it has built-in digital-to-analogue conversion, not to mention both a USB input for your computer and Ethernet capability to receive and play music over a home network, but then that's par for the Hegel course. The company may produce products with minimalist good looks – alright, total simplicity when it comes to its 'two controls, a display and go hunt for the power switch' front panels – but that doesn't stop it aiming for engineering designed to deliver not only on sonic grounds, but also with the kind of convenience modern users demand.

In fact, Hegel is bullish about what it has achieved in the H590, with company founder Bent Holter saying the DAC here

is 'the best we have ever designed', and that the amp features 'massive upgrades all over the digital domain'. And the designers clearly weren't done with the H590 yet, despite a specification running to MQA decoding and rendering, Spotify Connect and a Hegel-customised spin on Apple AirPlay, not to mention DSD256 capability via a computer connected to that USB port. The amp has been designed to be Internet-upgradable in the future, bringing added functionality.

That, in itself, is encouraging. After all, if you're going to drop £9000 on an amp, you're going to want to be sure it won't go out of date – or need some kludgy add-on box – at the first sign of some 'flavour of the month' new audio format or service. The H590 may not be meanly equipped out of the box, but given the company's

track record to date, you can be pretty sure there's more to come.

The amp is even designed with home and custom installation in mind, with Control4 built-in and two-way network control for other systems, meaning this is a very long way from the familiar concept of hairshirt amplification, not that it hasn't got itself covered when it comes to high-end audio credibility.

DIGITAL DIVA

Hegel's streaming and DAC section is a new in-house design, handling an extended format range – including quad-DSD and MQA decoding and rendering – while maintaining all file formats in their native form for optimal sound quality. In addition to its network and USB inputs, there are also three optical and two coaxial digital



ins, while the analogue inputs run to two sets of balanced line-ins and three on RCAs.

Fixed and variable RCA outs sit alongside the single set of speaker terminals, and features extend to a lockable maximum output level, to avoid amp damage or neighbourhood destruction should someone get carried away, and a unity gain option allowing the amp to be used with a home theatre receiver or processor.

Setting this is slightly fiddly, but the unity gain pass-through can be applied to any of the analogue inputs if required. Or, as Hegel points out, to use the H590 with the likes of Sonos or Bluesound and their amplifier connection devices: lock out the volume on the amp, and you can control the level via the relevant multiroom app.

ROOTS OF POWER

Under the expansive bonnet, Hegel's 'SoundEngine2' amplifier technology employs an adaptive feedforward error

correction to reduce distortion. The preamplifier section uses hand-matched transistor pairs and a custom-designed volume attenuator, while the power amp uses a dozen high-speed output transistors for each channel, plus separately regulated power supplies for input, voltage gain and current gain stages.

That's what gives this amplifier not only its remarkable grip and control, but also makes it largely resistant to the vagaries of the speakers with which it's used. If there's a 'drive anything' amp on the market, this is quite possibly it, as PM explains in our boxout [see below].

A quick note on using the H590 for network streaming: in common with some similar amps, it's purely a renderer, and needs to be used with a third-party app running on a smartphone or tablet as the control 'link' between a NAS – or the Internet – and the amp. Hegel suggests Linn's Kinsky app, which seems perfectly sensible, and recommends the use of QNAP

ABOVE: The H590 is an object lesson in Hegel's trademark simplicity, albeit writ large. Source and volume controls join a headphone socket, and a power button hidden under the fascia

NAS devices for music storage, which also won't get any argument from me, as I run no fewer than five of them!

TAMING THE BEAST

Whether you use analogue sources, local digital ones or stream over a network, the only way to describe the H590 is mighty impressive – which may be one description or two. If you expect all that power means it handles music with all the finesse of a nuclear-powered icebreaker pounding its way through the floes, you'll be a very long way from the reality. Yes, this amp will drive hard – harder than any of us are really ever likely to need, however large our room or recalcitrant our speakers, in fact – but more to the point is that this 'beast' of an amplifier has a remarkably light and precise touch, albeit allied to devastating dynamic ability when the music requires.

Not so demanding on that dynamic slam is Alison Krauss and Union Station's *Live* set [Rouner 11661-0515-6; DSD64], where the amp delights with the warmth of the live ambience and the excellent clarity of the harmonies, not to mention Krauss's voice. The acoustic instruments have a fine sense of finger on string, the upright bass is deep and powerful, and the snappy playing of 'Choctaw Hayride' has an inescapable, foot-tapping swing to it.

Keep the Texas vibe going with some vintage ZZ Top, and the H590 does its 'no substitute for cubic inches' thing in swaggering style, shifting gear from plaintive blues to downhome boogie with 'Brown Sugar' on the band's first album [*The Complete Studio Albums 1970-1990* boxset, Warner/Rhino; 192kHz/24-bit download]. The guitars are already powering hard on this early style-setting



RIGHT: Six pairs of ultra-fast high current power transistors are deployed per channel [heatsinks, left and right], fed from a huge toroidal transformer and linear PSU. The new digital board [top] offers, USB, network access and MQA

WHAT'S IN A WATT?

Hegel makes no fanciful claims for the prodigious output of its H590, aside from describing it as 'a beast'. In practice, however, the H590 really is in the top tier of the world's most powerful integrated amplifiers. Into a standard 8ohm load, the H590 is bested by the Perreaux 255i at 435W/8ohm [HFN Apr '18], Marantz's 620W/8ohm PM-10 [HFN Aug '17] and the 410W/8ohm MA9000 from McIntosh [HFN Sep '18]. However if we judge the H590 by its tolerance of low impedance speaker loads then the tables are turned. Under dynamic, music-like, conditions Marantz's PM-10 is limited to 170W/1ohm, for example, while the 255i gives more gas at 610W/1ohm (26.7A) followed by the MA9000 at 935W/1ohm (30.6A). What of other 300-watters? Musical Fidelity's Nu-Vista 800 [HFN Nov '14] delivered a very similar output to the H590 at 2x325W/8ohm and with a massive 2.2kW/1ohm (46.4A) under dynamic conditions. The H590 just edges ahead by the skin of its transistors at 2.285kW/1ohm (47.8A). Only the Krell S-550i [HFN Jul '13] was marginally beefier at 2x336W/8ohm and 2.4kW/1ohm (49.4A). Judged by these standards the H590 will surely drive the least sensitive of loudspeakers, with the most demanding load impedances, ever likely to cross its path. PM



ABOVE: Top left of the rear panel are fixed and variable preamp outputs, with five line inputs (two balanced on XLRs, three single-ended on RCAs). The row of digital ins includes three optical, two coaxial (RCA/BNC), a USB Type B and an Ethernet port

package, and the rhythm section is absolutely unstoppable.

Move on to that glorious break in the middle of 'Cheap Sunglasses' from Degüello, and the drive of the Hegel amplifier makes it clear how much more refined the band's recordings had become within less than a decade, but without losing sight of the soul at the heart of the music. Fast, heavy and yet so detailed, the H590 does this kind of blast to perfection without ever breaking its composure.

CANNON FIRE

Warming up the seemingly limitless dynamics of the amp, whether used with my PMC OB1 speakers or the smaller Neat Iota Xplorers [HFN Jul '18], it seemed rude not to play The Who's explosive 'Won't Get Fooled Again' [Who's Next; Polydor UIGY-9596; DSD64 download]. I wasn't disappointed, for the lead guitar and vocals had striking clarity, every note The Ox grumbled out was readily audible and, of course, the drums were like controlled cannon fire – just as it should be.

So after playing that three or four times at ever-increasing levels, during which I discovered that the H590 is quite possibly the definitive 'it just goes louder' amplifier, a respite in the form of Reference Recordings' *John Williams At The Movies* [RR-142; 176.4kHz/24-bit

download], and his march from Spielberg's movie *1941*. Oh dear, here we go again, as the opening woodwind builds into big bold brass and great crunches of drums, courtesy of the Dallas Winds conducted by Jerry Junkin. And that's before I got to their take on 'The Star Spangled Banner' with the percussion section doing a full-on fireworks display!

Switching between the H590 in streaming mode and fed via both digital and analogue inputs from my Naim NDS/555PR DR network player proved there was really nothing in it beyond a slightly greater sense of restraint and precision from the Norwegian amp's digital section. This was perhaps best in evidence with the delicacy of Xiayin Wang's reading of Rachmaninov's 'Etudes-Tableaux' [from Chandos CHAN 10724; 96kHz/24-bit] where the extra detail in the shaping of each note via the streaming H590 was traded off against a bit more fluidity and flow from the NDS.

That this amplifier does all it does, and can still rival a digital player ticketed at more than its £9000 price, is nothing short of remarkable – but then this is an utterly compelling amplifier. ☺

HI-FI NEWS VERDICT

Big, powerful and, yes, expensive, the Hegel flagship is anything but brutish, combining the confidence of clout in reserve with a delicacy and refinement you might not expect. It's certainly high-end, but makes no concessions to ease of use or flexibility, not least thanks to its excellent digital platform. In fact, it's one of the most 'complete' integrated amplifiers we have ever tested. Outstanding!

Sound Quality: 89%

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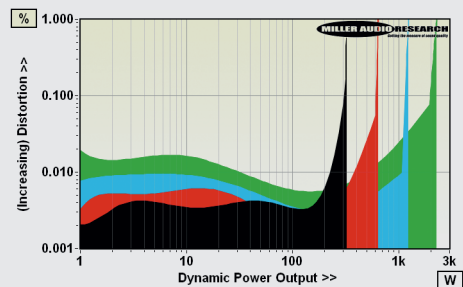
LEFT: Hegel's system handset partners with its other separates, offering input, volume, mute and display adjust here

LAB REPORT

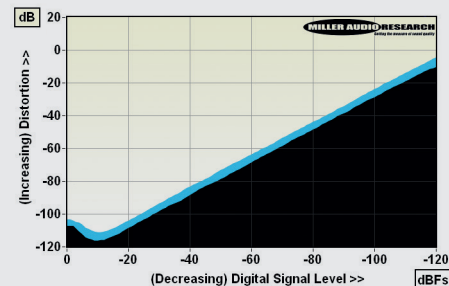
HEGEL REFERENCE H590

Whether a misprint or simply devilish humour, Hegel's original specification for its 'Master and Commander' integrated pegged its power output at 301W/8ohm, a very precise figure that's met in practice at 2x310W and 2x590W into 8 and 4ohm, respectively. That +2.8dB increase from 8-to-4ohm is illustrative of the H590's massive and tightly-regulated power supply, a reservoir that feeds a dynamic output capability of 325W/8ohm, 640W/4ohm, 1.24kW/2ohm and a huge 2.285kW (47.8A) into 1ohm [see Graph 1]. This power is delivered through a low 0.013-0.045ohm source impedance and a response that's flat to within -1dB from 6Hz-73kHz (-1.8dB/100kHz). Noise is very low too, the H590's sensibly 'low' +32.6dB gain (balanced inputs) contributing to its wide 90dB A-wtd S/N ratio (re. 0dBW). Distortion is equally low and climbs only gently with increasing output from 0.0015%/1W to 0.0022%/10W, 0.004%/100W and 0.007%/200W through bass and midrange. Versus frequency, THD increases beyond 5kHz although it still only reaches 0.005%/20kHz at 10W/8ohm.

The digital board, based on an AKM AK4490 DAC with minimum phase/fast roll-off filter selected by Hegel, offers very low distortion of just 0.0006-0.00095% (20Hz-20kHz, 0dBfs), with a minimum of 0.0001% [see Graph 2, below] and with response limits of -0.28dB/20kHz, -1.4dB/45kHz and -3.8dB/80kHz (to -24dB/90kHz) with 48kHz, 96kHz and 192kHz media, respectively. The fixed line-level output offers 2.46V from a high-ish 555ohm source impedance, and a passable A-wtd S/N ratio of 101dB with a resolution of ±0.3dB over a 100dB range. Jitter, meanwhile, is impressively low at <15psec. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 47.8A



ABOVE: Distortion versus 24-bit digital signal level over a 120dB range at 1kHz (black) and 20kHz (blue)

HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	310W / 590W
Dynamic power (<1% THD, 8/4/2/1ohm)	325W / 640W / 1.24kW / 2.29kW
Output impedance (20Hz-20kHz)	0.013-0.045ohm (555ohm, pre)
Freq. resp. (20Hz-20kHz/100kHz)	+0.0 to -0.15dB/-1.8dB
Digital jitter (S/PDIF at 48kHz/96kHz)	15psec / <10psec
A-wtd S/N ratio (re. 0dBW/0dBfs)	90.1dB (Analogue) / 101.4dB (Dig)
Dist. (20Hz-20kHz; 0dBW/-20dBfs)	0.002-0.0053%/0.001-0.0002%
Power consumption (idle/rated o/p)	105W / 1015W (1W standby)
Dimensions (WHD) / Weight	430x171x445mm / 22kg