

hi-fi news

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& Record Review

SUBLIME STEREO

**300i tube amp –
Nagra's finest?**

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Rock 'n Roll venue'
The Marquee Club, p72**



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Nagra 300i (£15,950)

In celebrating the company's 60th anniversary Nagra's specialist hi-fi division pays homage to the 'king of tubes', the timeless 300B triode, in a new stereo amplifier
Review: **John Bamford** Lab: **Paul Miller**

A key difference between consumer electronic components manufactured for hi-fi systems and professional products made for sound engineers is the fact that you can drag pro gear across a room by its mains lead without it breaking,' quipped an industry veteran to me, way back when. Witticisms like that, noted during formative years, tend to remain embedded in one's memory banks for life. As does the iconic Nagra marque. Think Nagra and you think Swiss precision engineering at its finest: electronics made for professionals. Who, among audio enthusiasts, *isn't* familiar with those rugged portable tape recorders of yore used by sound engineers for location recording? In today's digital age Nagra still makes recording gear. However, the company has diversified and grown immensely over the decades.

HIGH-END PRECISION

It was as recently as 1997 that Nagra first began applying its electronics and mechanical engineering expertise to top-end hi-fi for audiophiles. First came the PL-P vacuum tube preamplifier with phono stage, soon to be followed by amplifiers (both valve and solid-state), the 24-bit/192kHz Nagra DAC in 2003, and a range of CD spinners in 2006.

Developed by the same engineering and production teams responsible for its professional products, Nagra's high-end audio components positively reek of the marque's DNA. Build quality and design – that legendary Swiss attention to detail – is fabulous, the Nagra/Kudelski Group boasting in-house production facilities that artisan makers of boutique hi-fi can only dream about.

Our photographer went weak at the knees while shooting this new 300i integrated. It *is* beautifully made. And just

RIGHT: Six multi-layered PCBs with gold-plated tracks contain separate amplification, supply and control circuitry. The ground-plane of the circuits adopts a 'star' configuration

like all Nagra products, its industrial design harks back to those classics of yesteryear that any audio enthusiast above a certain age recognises as 'Nagra' in an instant. No, we didn't try dragging it across the studio floor by its mains lead!

That Nagra would celebrate its 60th anniversary by producing an amplifier employing 300B direct heated triodes, a 'symbol of timelessness in audio', has hardly been the hi-fi arena's biggest kept secret. Prototypes were previewed to the trade at CES in January 2010.

When first introduced in 1938 by Western Electric no other valve had as much output as the 300B – capable of delivering 6-8W in single-ended operation. Early hi-fi pioneers adopted it and to this day there remain valve aficionados who will listen to nothing else, citing its midrange

'to die for'. Production of the 300B ceased in the late 1980s, causing prices to soar as collectors scoured the world for increasingly hard-to-find stocks. Only in recent times, now that valves are once more readily available, have they reduced such that designing and building amps around the 300B is feasible once again.

The legend that is the 300B isn't purely about nostalgia, by the way. Many audiophile designers around the globe, including some designers of hi-tech solid-state gear, maintain that direct-heated triode tubes are the most linear amplification devices known to man. The 300B was the first of the breed, concomitantly it is often regarded the most 'purist' due to its simplicity.

Nagra's 300i employs a pair of Slovakian JJ Electronic 300Bs per channel in push-pull





LEFT: The 300B tubes are protected by Pyrex cylinders. Multi-function modulator displays tube bias, speaker load matching, output level

Nagra is also making a power amp version with balanced (XLR) and single-ended (RCA) inputs selected via a jumper on its rear panel. Called the 300p, it is priced at £12,950.

A MODERN SPIN

Homage to hi-fi's 'golden age' it may be, but there is nothing old-fashioned about the sound of Nagra's 300i. Defying stereotypical tubey cosiness, it sounds quick on its feet and is light of touch, the music emanating from beautifully silent backgrounds. You might be disappointed if hoping for a rich, warm and syrupy midrange with thick, cuddly bass and 'gentle' treble. This amplifier sounds fast and explicit – and wholly modern in its resolving capability.

Its crystalline, delicate delivery provides detail in spades, but with none of the hectoring you find with those brightly-lit amplifiers that seem determined to grab the attention. No, what the 300i does is far more subtle. It delivers fabulous three-dimensionality, has a sweet treble for sure, and with good quality source recordings the 'blackness' of the silences helps create holographic soundstages extending far beyond the edges of your monitors.

Several tracks from Nick Drake's charming *Bryter Layter* album [2000 CD remaster, Island 422 846 005-2] perfectly showcased the amplifier's seductive charms. 'Northern Sky' had Drake's delicate acoustic

guitar appearing eerily lifelike and his melancholy voice sounding golden-honeyed. The individual elements within the soporific 'At The Chime Of A City Clock' – intimate vocal, resonant and full-bodied acoustic guitar, soulful saxophone with oodles of space around it, and the sweet, luscious string arrangement – were clearly separated and easy to listen into, yet depicted all of a piece thanks to the believable solidity of the image. The guitar (stage left) and flute (stage right) in Drake's instrumental 'Sunday', the album's closing track, had an uncannily lifelike presence, the instruments portrayed once again within a three-dimensional image filled with light and air.

The thought of owning a 300B-powered valve amp rated at 20W might not even register in the minds of most rock music

configuration to produce a 'useful' 20W per side. Quite unlike all-valve single-ended (lower-power) designs with, say, point-to-point wiring and zero feedback, the 300i employs sophisticated solid-state electronics for its driver stages, circuit surveillance and diagnostics, and microprocessor-controlled input selection and volume/balance circuitry.

SWITCHING TUBES

Suggests Nagra: '...directly-heated triodes have a tendency to amplify noise in the power supply, particularly around the filament heater frequency.' The company says its powering circuits have been most carefully implemented to provide clean, stabilised voltages, thereby giving reliable performance irrespective of the type of 300B used. Tube 'rollers' caring

to experiment with alternative brands are positively encouraged to do so...

Unusually, the 300i's twin output transformers are toroidal rather than C-core types, bespoke designs handcrafted in-house. They're enclosed in a separate tower filled with silicon damping material. On unpacking the amplifier, the tower needs to be mounted on the amplifier's chassis using supplied bolts and steady hands. All tools required for assembly are supplied – as are gloves for careful handling of the precious valves. The 300i also comes with one of Nagra's elaborate VPS vibration isolation platforms, a £1425 item when purchased separately.

'The "blackness" of the silences helps create holographic soundstages'

KUDELSKI CONNECTION

So you think you know Nagra? Its heritage dates back to 1951, when Polish-born Swiss engineer Stefan Kudelski invented the first Nagra I portable tape recorder. (The Polish word 'nagra' translates as 'record'.) Nagra's compact, rugged and ultra-reliable tape machines were to become ubiquitous in the world of feature film and TV sound location recording. Miniaturisation of circuits also led to the company specialising in covert recording devices for the security services. Stefan's son André Kudelski has headed up the company since the early 1990s, the Kudelski Group diversifying – extremely successfully – into the development of encryption and descrambling systems for Pay TV. It has further expanded into designing and manufacturing access control systems for buildings, sports arenas, and the like. The Group's annual turnover is typically around £350m.

LAB REPORT

NAGRA 300i (£15,950)

With a pair of 300B tubes in a Class A push-pull configuration, Nagra very realistically rates its 300i at 2x20W, a figure achieved at 1% THD through 8 and 4ohm taps into 8 and 4ohm loads, respectively. Pushed harder, the 300i delivers 2x25W at 2% distortion into the same loads, achieving 27-30W into 2/1ohm loads under dynamic conditions [see Graph 1, below]. Needless to say, the 300i is ideally suited to very sensitive and relatively easy-to-drive loudspeakers.

In practice, the amplifier warms up very quickly indeed, achieving a stable distortion of 0.12% (left channel) and 0.24% (right channel) within a few minutes. The fact that distortion is twice as high on the right than the left channel is interesting, especially as the 300B tubes are matched and we had precisely 'tweaked' the bias via Nagra's modulometer. As Graph 2 illustrates, this difference between channels is most obvious through the bass and mid rather than high treble frequencies. The character of this distortion is complex, with 2nd/3rd harmonics dominating a spectrum that extends out to the 7th.

The output impedance is also relatively high at ~3ohm so there's some modification of the overall system response in line with variations in the speaker's load (versus frequency). Into an idealised 8ohm load, the 300i has -3dB points of 15Hz-50kHz (-1dB from 48Hz-32kHz) but offers a slightly flatter, extended high treble via its 4ohm tap into lower loads. Finally, noise is very low indeed, leading to an above-average A-wtd S/N of 95dB (re. 0dBW). Readers can view a comprehensive QC Suite test report for Nagra's 300i amp by navigating to www.hifinews.com and clicking on the red 'download' button. PM



ABOVE: There are four line inputs, one balanced (XLR) and three single-ended (RCA). Output transformer has speaker binding posts for 4, 8 and 16ohm loads

fans but, rest assured, if the 300i is partnered with speakers that are not too hungry it will rock 'n' roll with the best of 'em. Elbow's 2008 stomper *The Seldom Seen Kid* [Fiction/Polydor 1764098] didn't win a Mercury Prize for audiophile sound quality, that's for sure. But it is what it is, the Nagra 300i helping to peel back the layers to draw one in to the music. Production and processing techniques were highlighted, warts 'n' all, in 'The Bones Of You' as the gating of percussion creates a pumping effect within the track. Sheer power never seemed an issue, even as I cranked up the volume in readiness for the head-banging riff of 'Grounds For Divorce'.

BEST SEAT IN THE HOUSE

Climbing out of my imaginary mosh pit I was transported to the best seats in the house when spinning up Keith Johnson's 2009 recording of the Kansas City Symphony under Michael Stern coupling Britten's *The Young Person's Guide to the Orchestra* and *Sinfonia da requiem* [SACD, Reference Recordings RR-120]. The breadth and depth of the image was immense, the sound grain-free, liquid, detailed, full of vibrant colours and richly textured. As the music ebbed and flowed dynamically on this audiophile recording I was very aware of the precise way in which the Nagra

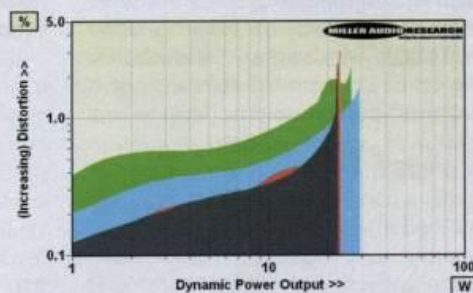
recreated perspective and scale. The grumbling of basses and cellos, delicate woodwinds, shimmering cymbals and air-moving timpani were captivating. During the *Sinfonia* the assault on the kettle drums approximately 7m into the piece sounded nothing short of magical as the pressure waves reverberated throughout the venue.

Less realistic – this grand orchestral score is 'sullied', in purist audio terms, by myriad overdubs and mixing – but nonetheless stirring was Hans Zimmer's heroic music from the movie *Inception* [CD, Warner/Reprise 9362-49650-3]. The contribution of the Smiths/Cribs guitarist Johnny Marr, who appears on several of the tracks, was clearly resolved thanks to the Nagra's wonderful clarity, adding intrigue to the rounds of Zimmer's heroic, tension-building melodies. ☺

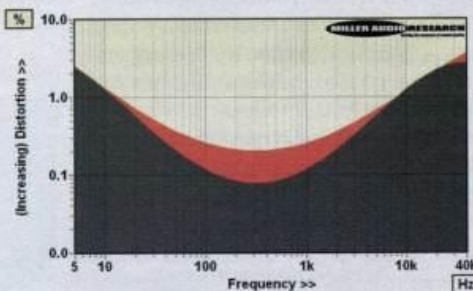
HI-FI NEWS VERDICT

Nagra's fine build quality does not come cheaply. But as well as being beautiful to behold, the fabulously clear and open sound of the company's new 300i integrated amplifier fully vindicates the careful design work and superior manufacturing techniques employed to craft it. Partner it with sensitive loudspeakers and the 300i will provide a see-through window to the treasure in your music library.

Sound Quality: 84%



ABOVE: Dynamic power output versus distortion up to 2% into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads



ABOVE: Distortion vs. frequency from 5Hz to 40kHz (1W/8ohm) through left (black) and right (red) channels. Note increase on right through bass/mid

HI-FI NEWS SPECIFICATIONS

Power output (<2% THD, 8/4ohm)	25W (8ohm tap) 25W (4ohm tap)
Dynamic power (<2% THD, 8/4/2/1ohm)	23W 23W 30W 27W
Output impedance (20Hz-20kHz)	2.9-3.6ohm
Frequency response (20Hz-100kHz)	-2.0dB to -13.4dB
Input sensitivity (for 0dBW/20W)	120mV 555mV
A-wtd S/N ratio (re. 0dBW/20W)	95.4dB 108.4dB
Distortion (20Hz-20kHz/10W)	0.57-2.2% (left) 0.72-2.1% (right)
Power consumption (Idle/Rated o/p)	113W/143W
Dimensions (WHD)	277x275x232mm

