Network-enabled outboard DAC/CD player
Made by: T+A elektroakustik GmbH & Co. KG, Germany
Supplied by: Avoke Ltd
Telephone: 07876 246956
Web: www.taelektroakustik.de; www.avoke.co.uk
Price: £7900

T+A MP 3000 HV

This do-it-all media hub combines a CD player and FM tuner with a network streaming client and a plethora of digital inputs. It also boasts no-compromise build quality

Review: **John Bamford** Lab: **Paul Miller**

Since reviewing T+A's DAC 8 digital-to-analogue converter [*HFN* Oct '12] it has become a reference against which I judge all other DACs. At £1900 it's hardly beer-budget, but can be considered an audiophile bargain when compared with more extravagant audio esoterica, much of which doesn't come close to featuring the depth of engineering – and hi-res sound quality – of the T+A design.

The same DAC architecture has been transplanted into this luxuriously built multi-function media player, the first of a new line of high-end pure audio components from Germany's T+A. Dubbed 'HV' (for High Voltage), the company's new series includes a matching MOSFET-powered integrated amplifier in which the output stage is driven at ±160V – twice as high as usual for an amplifier of this output. You'll be reading about this amp in a month or two, since I'm already listening to it as I write this. A pre/power amplifier will also join the HV-Series later this year.

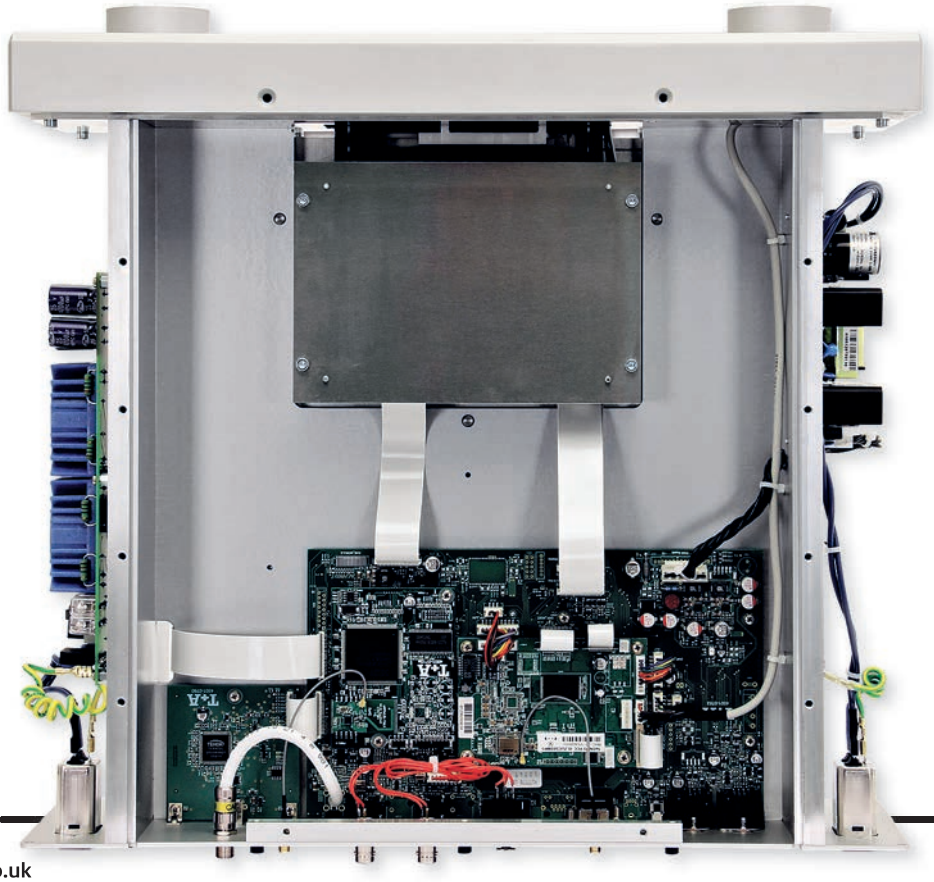
As with T+A's ever-so-21st century £2900 Music Player *balanced* [*HFN* Feb '12] – one of T+A's modestly-priced E-Series components – the MP 3000 HV comprises a CD player, a UPnP network client for computer-sourced music streaming via Ethernet or WLAN, an internet radio incorporating the familiar vTuner platform, and an FM radio tuner with RDS. Naturally, since it has a high-end DAC at its core, it features an asynchronous USB input for 'pushing-in' audio data from computers, and it sports no fewer than six digital inputs at the rear to accommodate a plethora of digital sources as well.

Furthermore the on-board streaming client (SCL) can play music files directly from HDDs and memory sticks via two Type A USB sockets, one on the rear panel and another on its fascia. Think of it as a Music Player *balanced* (albeit without iDevice connectivity) but on steroids – since it features the company's top-line DAC and has been built without compromise.

IMPECCABLE DESIGN

Really, in true high-end tradition its design and construction is *completely* over-the-top, its aluminium case having separate sections for the mirror-imaged left and right channels and totally independent power supplies for its digital and analogue sections – right down to having two AC power inlets! There are five compartments separated by aluminium dividing walls housing the MP 3000's DAC, digital supply, analogue supply, analogue section and, behind the 4cm-thick fascia, its control circuitry and display screen. The CD transport, whose drawer is guided by two stainless steel pushrods, lies in a sealed housing and floats on a three-point suspension system. The whole caboodle weighs a not inconsiderable 40kg.

At its core, then, are eight Burr-Brown 32-bit/384kHz Sigma Delta DACs used in a 'double symmetrical' quadruple arrangement, with oversampling carried out by a 56-bit DSP. The MP 3000 HV also features the DAC 8's four digital filter options [see PM's boxout] that can be selected via remote control and choice of 60kHz or 120kHz bandwidth reconstruction filters in its discrete and fully differential analogue stage. Again, it's something of turbo-charged DAC 8 in its implementation, since here the digital and analogue supplies are considerably more powerful and completely independent with their own filtering and separate mains leads, and in the MP 3000 HV the supply voltages for the analogue stages are higher (±40V) which, says T+A, improves dynamic response and overall sound quality.



RIGHT: Partially disassembled, our inside shot shows the hermetically-sealed and suspended CD drive with digital input PCB below. The digital filter DSP, DAC and analogue stages are in a screened compartment above (removed here)

And as seen in the DAC 8, key design features include a sophisticated system for clock regeneration to minimise jitter – with separate quartz oscillators used for 44.1kHz and 48kHz clock families – and galvanic isolation between the digital and analogue section using Analog Devices' magnetic i-couplers. For USB Audio Class 2.0 functionality, allowing asynchronous transfer between a computer and the MP 3000 HV and the ability to play 24-bit/192kHz files, you'll need to install T+A's driver, or you will be restricted to 24-bit/96kHz (USB Audio Class 1.0). This goes for Macintosh as well as Windows PC users, since T+A uses the Tenor TE8802L USB receiver chip from Galaxy Far East Corp. Says engineering boss Lothar Wiemann: 'We prefer it to the XMOS receiver on a technical level, but the chip is not currently supported by the Mac OS. Driver support for the Tenor has, however, been recently integrated in the Linux kernel, so perhaps we'll see its integration in the Mac OS in a short while…'

A final feature of note is the supplied remote controller: it's T+A's £390 FD 100 handset, a bi-directional RF controller with built-in colour LCD. It's a lovely bit of kit (complete with charging base) not dissimilar to a Sonos handset, that even displays cover artwork when the MP 3000 HV is streaming audio via a home network.

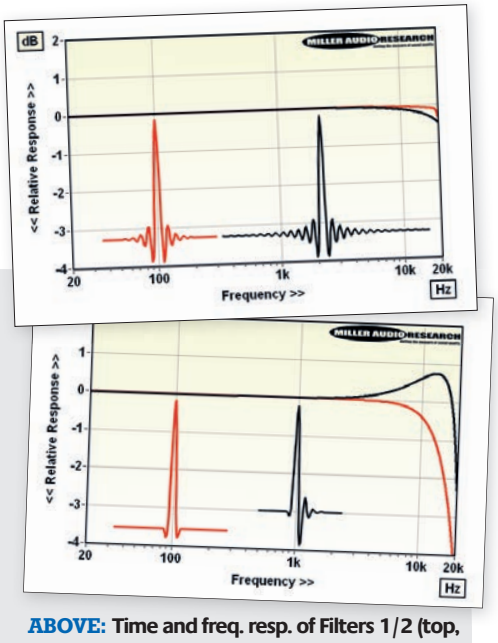
MUSICAL INSIGHTS

As we found when we tested T+A's E-Series media player last year, the MP 3000 HV proved exceptionally slick both in ease of setup and functionality. Enthusiasts demanding glitch-free operation of hi-res audio should forgo using wireless networking (not entirely robust with 192kHz files, I found) – but if you're an audiophile craving the ultimate in sound quality you wouldn't go there anyway, would you? It worked seamlessly via Ethernet and sounded better than any music streamer I've ever used, with little evidence of the rather image-smeared and opaque characteristics I've observed in the past when listening to music via network players. I *was* impressed, the player sounding bold and dynamic and offering the sort of musical insight I'm accustomed to hearing from the very best digital sources plumbed into my system.

> 'It took the crash of percussion and the rasp of brass in its stride'

But with computer audio I'm a 'pusher' rather than a 'puller', as I find navigating the folder structure of an extensive music library via the small screens of network music players (or, in this case, the dinky LCD built into the MP 3000 HV's remote) a right pain. Since the 'joy' of computer audio is having one's entire music collection at your finger tips and accessible in an instant, I much prefer the simplicity

ABOVE: Rotary source selector and menu/media navigation controls employ needle roller bearings and feel luxurious. A large VFD features context-driven, touch-sensitive controls



ABOVE: Time and freq. resp. of Filters 1/2 (top, black/red) vs Filters 3/4 (bottom, black/red)

FILTER FLAVOURS

Taking its cues from the DAC 8 [*HFN* Oct '12] the MP 3000 HV also offers the option of four switchable digital filters that operate on all media up to 96kHz. Filters 1 and 2 are 'traditional' linear-phase Finite Impulse Response types while 3 and 4 are minimum-phase filters based on Bezier polynomials. The default Filter 1 (used for most of my measurements) has obvious pre/post ringing, which is not ideal, but traded for low phase distortion and excellent rejection of aliasing images. Filter 2 is a short FIR type, with less pre-ringing but a poorer rejection of out-of-band images. Filter 3, a mixed Bezier/interpolation filter, has some post-ringing but almost no pre-ringing but neither does it suppress ultrasonic images. Low (44.1/48kHz) sample rate data is left with a treble peak and increased phase distortion. Filter 4, a pure Bezier type, offers almost perfect time domain behaviour – no ringing – but a rolled-off treble response with 44.1/48kHz media. It's like a 'NOS DAC' [see p54] but with digital filter intact! PM

ABOVE: Balanced (XLR) and single-ended (RCA) analogue outs, both fixed, are joined by S/PDIF (RCA, two on BNC and two Toslink), AES/EBU (on XLR), USB 2.0 and wired and wireless Ethernet digital connections. The RF remote connects via an aerial. Note two IEC mains inlets for separate 'digital' and 'analogue' circuit power supplies

of pushing audio into a DAC and browsing the album jackets of my CD, SACD and DVD-A rips – and hi-res downloads, of course – via an adjacent monitor.

DISCERNING DIFFERENCES

It came as no great surprise that when used as a standalone USB DAC the MP 3000 HV doesn't sound identical to the DAC 8 with which I'm so familiar. Sure, it displays a similarly 'clean' purity that provides a transparent window through which to observe music, but where the DAC 8 appears squeaky-clean and vibrant, the MP 3000 HV adds a little warmth and maturity. This was illustrated by the reproduction of acoustic bass, piano and voice in Patricia Barber's 'Bye Bye Blackbird' from her *Nightclub* album [Blue Note/Premonition 27290 2 9].

The piano appeared bolder and richer-toned here, Barber's voice more intimately mic'd and the reproduction of the track's double-bass better defined. This fabulous recording, one that I use so often as a reference, sounded simply divine.

My system [see *www.hifinews.co.uk/news/article/meet-the-team;-john-bamford/9884*] delivers a relaxed and 'luxurious' sound, with oodles of lusciously deep bass and smooth high frequencies, and so I didn't *always* prefer the tonal character of the MP 3000 HV over T+A's leaner-sounding DAC 8. Listening for example to the latest download sample from Channel Classics, an excerpt from a Haydn string quartet, the sound was more open and 'fresh' via the DAC 8.

What the MP 3000 HV appears to do is flesh out the sound, adding bolder and fuller bass, richer colours, and refining high frequencies. My system rarely needs this, consequently the space of the recording venue was less explicitly described, the sound a tad 'dark' and less airy. But I've no doubt that most listeners will relish its more organic and silkier sound.

I tied myself in knots comparing the sound of the MP 3000 HV's CD replay with that of its network client and its DAC's S/PDIF and USB inputs. Malcolm Arnold's uplifting *A Sussex Overture* performed by the LPO [Reference Recordings RR-48CD] is a tremendously vivid 1991 recording with extremely lifelike crashing percussion and rasping brass. It's not always a comfortable listen, but the performance was taken in its stride, and was nothing short of enthralling.

I couldn't reliably discern any difference between the CD replay and the sound from the ripped disc, whether pushed into the USB input from a computer, streamed via Ethernet, or played from a memory stick, which speaks volumes about the thoroughness of the overall design. Only via its S/PDIF input did it sound less vibrant and dynamic – doubtless because I had a USB-to-S/PDIF converter and additional interconnect in the replay chain!

HI-FI NEWS VERDICT

We don't give away our 'Outstanding Product' badges lightly. This magnificent digital front-end component exhibits considered thinking and is evidently a work of passion and dedication to excellence. Frankly, in the world of specialist high-end audio, it can be considered a steal – since if it came from a boutique marque it might easily cost three or four times the price. It is utterly fabulous.

Sound Quality: 88%

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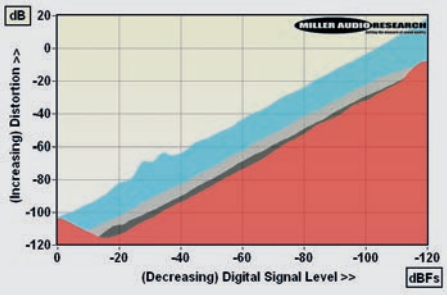
LAB REPORT

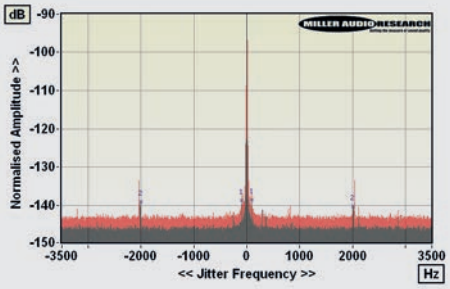
T+A MP 3000 HV

Tested in 'wide' mode with the 120kHz cut-off frequency, the response of all input sample rates – except 192kHz – is otherwise determined by your choice of digital filter [see box out, p35]. With CD or 48kHz digital inputs this varies from –0.3dB/20kHz to –4.6dB/20kHz while 24-bit/192kHz inputs via S/PDIF, USB or network are fixed at –7.3dB/90kHz regardless of filter. In fact the network connection also handles 32-bit floating-point files up to 192kHz although jitter is a little less tidy at 205psec. With all other 24-bit media at all other sample rates, correlated jitter varies from just 5 to 35psec while noise-like jitter is close to 0psec – a fabulous result [see Graph 2, below]. Distortion is very low at 0.0007% at its peak 4.6V balanced (output) falling to 0.0002% at –10dBFs and 0.0004% at –30dBFs [red trace, Graph 1 below] and only fractionally higher via USB 2.0 [black trace] and 16-bit CD [grey trace] although our sample showed a uniformly higher (analogue) THD via the right channel. There's also an increase in odd-order THD at higher frequencies (0.0004% at 1kHz to 0.014% at 20kHz/–30dBFs) as illustrated by the blue trace in Graph 1.

Technically at least, the MP 3000 HV has no glaring weak spot. The 4.6V maximum (balanced) output is joined by a wide 114dB A-wtd S/N ratio and low-level linearity is good to ±0.05dB over a huge 100dB dynamic range. The 45ohm output impedance confers broad compatibility while the 0.01dB channel balance and 130dB stereo separation are exemplary. For even more detail, readers may download full QC Suite test reports for the MP 3000 HV's CD, S/PDIF, USB and network audio performance by navigating to *www.hifinews.co.uk* and clicking on the red 'download' button. **PM**



ABOVE: THD vs. 24-bit/48kHz digital signal level over a 120dB dynamic range. S/PDIF and network (1kHz, red), USB (1kHz, black), CD (1kHz, grey; 20kHz, blue)



ABOVE: High resolution 24-bit/48kHz jitter spectra, S/PDIF and network (black) and USB (red)

HI-FI NEWS SPECIFICATIONS

Maximum output level (balanced)	4.61Vrms at 44-49ohm
A-wtd S/N ratio (S/PDIF / USB / network)	114.1dB / 114.1dB / 114.1dB
Distortion (1kHz, 0dBFs/–30dBFs)	0.00067% / 0.00038%
Dist. & Noise (20kHz, 0dBFs/–30dBFs)	0.00062% / 0.014%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	0dB to –0.39dB/–0.56dB/–7.3dB
Digital jitter (S/PDIF / USB / network)	6psec / 35psec / 10psec
Res. @ –100dB (S/PDIF / USB / network)	±0.05dB / ±0.05dB / ±0.05dB
Power consumption	10W (analogue) / 10W (digital)
Dimensions (WHD)	460x170x460mm