

T+A PA 1100 E

As T+A's midrange E series is reinforced by a new amplifier, based on the PA 1000 E but equipped with BT and a USB DAC, we ask 'is this now the stereotype for modern amps?'
 Review: **Jonathan Gorse Lab: Paul Miller**

As the latest in a long line of amplifiers from the German brand, T+A's PA 1100 E integrated is also one of the more innovative and comprehensive in its scope. The company (T+A stands for 'Theory and Application') has been manufacturing audio equipment since 1978 and prides itself on both its deep technical capability and in-house manufacturing. However, despite this heritage, the PA 1100 E is only the first of its amplifiers to include an onboard DAC – something very many competing brands have been doing for years.

So if you are looking for a single-box solution capable of servicing a mix of analogue and digital sources, or if you simply want to reduce your box count, and have previously admired T+A from afar, then this £3660 amplifier might well prove the perfect solution. In practice, the PA 1100 E is a development of the PA 1000 E [HFN Mar '17] – it features the same Class D amplification stages [see PM's boxout, p61] but trades one of the latter's balanced inputs for a TI PCM1795-based DAC board.

FOCUS ON FEATURES

Available in satin silver and black finishes, the PA 1100 E also shares the same casework with its supremely understated industrial design, exceptional build and finish quality. As an ambassador for Westphalia, T+A proves that 'Made in Germany' still stands for something!

Rated at 2x140W/8ohm [see PM's Lab Report, p63], this is a two-channel amp offering four single-ended line inputs, one of which can be configured for vinyl replay by specifying T+A's optional MM/MC phono module, a balanced XLR input and tape loop. Two coaxial and two optical inputs take digital sources up to 192kHz/24-bit, alongside a USB-B input for connection to a PC (up to 384kHz/32-bit and DSD256).

RIGHT: A substantial linear PSU [lower left] feeds a Class D power amp stage [top centre] – the high-speed MOSFETs are bolted under the centre of the middle PCB. The new digital board is piggybacked onto the preamp [top right]

Wireless Bluetooth is also offered along with a row of three HDMI sockets – a £390 option – two of which are suitable for connection to a Blu-ray player or TV/satellite box while the third, an output, carries video and audio (via ARC) back out to your flatscreen display. Note that the T+A PA 1100 E is a two-channel amplifier, so multichannel Dolby/DTS decoding is not included in its feature set.

Ranged along the front panel from left to right are a power/standby switch and a row of five input buttons. Each of the input selection buttons switches between several sources by repeated presses. For example, a single press of the input 1 button selects Phono input 1 and a multicolour LED above lights in red for analogue. Press that button again and the USB input is selected for playback from a computer source and the indicator LED above turns blue.

This basic idea extends to all five input selector buttons, some of which handle up

to four digital/analogue sources, variously denoted by a sequence of four different LED colours. A little puzzling at first, these multifunction controls certainly 'de-clutter' the fascia without compromising its broad flexibility. After a short and typically feverish burst of button pressing, you quickly get the hang of things...

FILTER TIPS

There are also ancillary features such as a tape record monitor and a selector for switching between speakers and headphones. Another button when briefly pressed turns the bass and treble controls on or off while a longer press switches the loudness function on or off. Finally, the button labelled 'OVS' switches between just two of the four digital filter options typically incorporated on T+A's costlier offerings [HFN Oct '19]. The default is a fairly standard linear phase FIR filter with a steep roll-off and the other is T+A's familiar



Bezier-style IIR filter. The latter offers reduced time-domain distortion at the expense of an early treble roll-off and poor alias rejection – it's best used with 96kHz (and higher) digital inputs.

Meanwhile, three flush buttons for bass, treble and balance pop out when pushed, the volume rotary is motorised for IR remote control, and there's also a separate 1/4in headphone socket for 'personal' listening. Unusually, the IR commands are not picked-up by an 'eye' in the amplifier's fascia, as is typical, but are snagged by a separate IR receiver that's plugged into the rear of the amplifier.

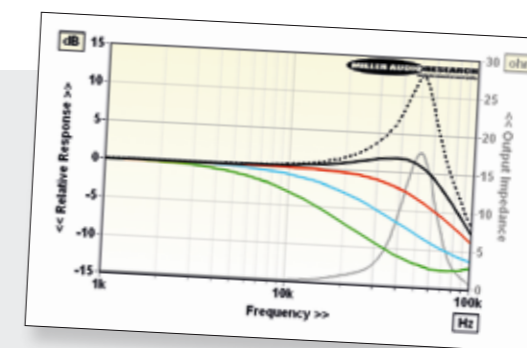
'It captured all the majesty of the Steinway Model D'

STRIKING IT RICH

The PA 1100 E was used in my reference system of Naim NDX network streamer and NAC82/NAP250 amps driving ATC SCM40 loudspeakers. Its USB input was tested by connecting it to a PC streaming hi-res files from my network server using foobar2000.

SPEAKER MATCHING

A key difference between T+A's PA 1100 E, and original PA 1000 E [HFN Mar '17], versus the costlier R-series PA 2000 R [HFN Feb '16] and PA 2500 R, is the E-series' use of Class D technology to offer high outputs and limited waste heat, all at an attractive price. While T+A's discrete MOSFET switching output stage is its own design, the PWM (Pulse Width Modulation) core of the Class D amplifier is based on an Infineon Technologies' IRAUDAMP Class D 'reference design' [HFN Sep '15]. Unlike the competing Hypex Ucd/Ncore Class D modules, the IT/T+A approach still indicates some of the drawbacks of 'traditional' Class D amplifiers. In particular, the amplifier's inductive output filters [see coils in pic, p60] push up the output impedance at ultrasonic frequencies [inset Graph: grey trace]. This has an impact on both distortion and frequency response within the 20kHz audio range, the latter varying with loudspeaker load impedance [inset Graph: unloaded/8/4/2/1ohm = black (dashed)/black (solid)/red/blue/green traces]. Into 8ohm it rises +1dB/20kHz but falls to -0.4dB/20kHz into 4ohm (and -7dB/1ohm). So if the impedance trend of your speakers rises through the treble then the PA 1100 E will likely sound brighter, and vice-versa. PM



From the beginning it was clear that the PA 1100 E is a smooth, warm and rich-sounding amplifier, no matter the source used. Vocals, in particular, sounded well rounded and lifelike while recordings that are inclined to harshness were rendered more pleasurable and involving than when heard on less-forgiving rivals. Of particular note was its handling of lower registers, with bass guitars and plucked double-basses sounding well extended, even if this was at the expense of some articulation at times.

The way this amplifier was able to convey the air around performers within a three-dimensional soundstage was satisfying too. Music is always best enjoyed when one is able to suspend belief that one is listening to a recording, and the PA 1100 E never let its grip slip when it came to delivering the ambience of a performance. At the same time it positioned instruments across a

ABOVE: The sleek, minimalist front panel plays it simple with volume, multi-source input buttons, speaker/headphone switching, and neat little pop-out tone and balance knobs

wide soundstage in a manner that was never less than highly believable.

First up was a 96kHz/24-bit HDtracks download of Michael Kiwanuka's 'Love And Hate' from his album of the same name [Polydor 4785905], streamed from my home server via the Naim NDX. With the PA 1100 E hooked up to the NDX via its RCA inputs, and the latter's built-in DAC doing the number-crunching, the room was suddenly alive with the singer's mellow vocals, his wonderfully rich and textured voice conveyed with all its honey-drizzled warmth intact. Particularly striking was the way the amplifier conveyed the space between the performers, especially when it came to the sense of stage depth between the lead and backing vocalists.

Switching to the PA 1100 E's built-in DAC fed by the Naim NDX's coaxial digital output revealed the Naim DAC to be a tad more incisive in its presentation of the Kiwanuka track. There was also a feeling of greater dynamics. Yet both renditions were close, and I could happily live with either. The PA 1100 E certainly impressed with its seamless top-end, and there wasn't a hint of harshness to be heard from the fuzz of the soaring lead electric guitar solo that carries the song to its close. This was quite a feat given that this isn't the cleanest piece of production out there.

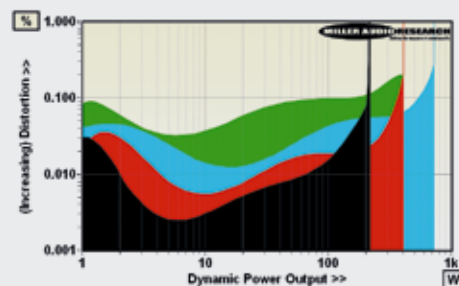
TRUE TO LIFE

Conversely, 'I'm Just An Old Blues Singer' by The Blues Company & The Fabulous BC Horns [O'Town Grooves; In-Akustik INAK 9096 CD] is a superbly well-engineered recording and one with a wonderful live feel. The PA 1100 E was convincing and compelling in its delivery of the band, both as individual players and as a cohesive whole. The electric guitars were

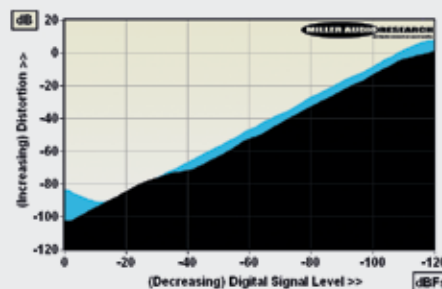
T+A PA 1100 E

The PA 1100 E's Class D amplifier bests its rated 140W with 2x160W/8ohm and 2x265W/4ohm while, under dynamic conditions, there's headroom to service peaks of 215W, 415W and 720W into 8, 4 and 2ohm loads with protection limiting output to 405W into 1ohm [see Graph 1, below]. Otherwise performance is influenced by the Class D architecture, including its slightly below-average 78dB A-wtd S/N ratio (re. 0dBW) that would be closer to 73dB if various ~18-22kHz spurs were included. The reactive output impedance climbs from 0.04-0.05ohm/20Hz-1kHz to 1.1ohm/20kHz, peaking at 18ohm/52kHz [grey trace, inset Graph, p61], and influencing the amp/speaker response accordingly. Distortion also rises with frequency from <0.0035% through bass and midrange to 0.05%/20kHz and 0.1%/40kHz, but is typically 10x higher under dynamic conditions over the first few watts. This is clearly illustrated in Graph 1 while, under continuous output conditions, distortion increases more linearly with output from 0.001%/1W to 0.004%/10W, 0.014%/100W and 0.019% at the rated 140W/8ohm (all at 1kHz).

The PCM1795-based DAC stage offers a 104dB A-wtd S/N ratio from a 1.2V preamp output. Good jitter rejection is achieved at ~80psec (all sample rates, all inputs) while distortion falls to a minimum of 0.0009%/1kHz and 0.0022%/20kHz over the top 20dB of its dynamic range [see Graph 2]. The default FIR digital filter offers responses of -0.3dB/20kHz, -1.6dB/45kHz and -3.9dB/90kHz with 48kHz, 96kHz and 192kHz files, respectively. T+A's own Bezier IIR filter eliminates any pre/post ringing in the time domain but alias rejection is poorer and the responses are -4.6dB/20kHz, -5.7dB/45kHz and -7.6dB/90kHz. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 20.1A



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



ABOVE: Alongside the tape loop and four line inputs (inc. one balanced XLR and one optional MM/MC phono) are USB-B, two coaxial and two optical digital inputs. HDMI module is also optional. Bluetooth supports aptX but the wired LAN is for control only

full-sounding and warm, while the drums not only enjoyed fine impact but a scale that was strikingly true to life. Yes, the bass line was a little softer than ideal, sounding 'bloomy' at times, yet never did this detract from the sheer musicality on offer.

The ability to accommodate a range of digital feeds is one of the key benefits of this flexible amplifier and the inclusion of a USB input enables a PC to act as a high-quality music source. Deacon Blue's *Live At Glasgow Barrowlands* set [EAR Music 02111866EMU] captures the Scottish band in blistering form. On the track 'When Will You (Make My Telephone Ring)?' there's wonderful interplay between Hammond organ and piano that relies on the touch and feel of the musician to convey the emotional message.

GRAND MASTER

The PA 1100 E rendered the leading edges of the piano notes – which are so crucial to the song – beautifully, setting them in front of the laconic, but skilfully-judged drum work. Heard via lesser amplifiers this track can sound cloying and overblown, but not a whisper of its intimacy and immediacy was lost in the capable

hands of the T+A PA 1100 E.

Switching between the FIR and Bezier-style filters was instructive here. With the standard FIR filter, just a hint of glare was present on Lorraine McIntosh's backing

LEFT: The USB-rechargeable FM 11 remote offers input select, volume, tone/loudness bypass and digital filter select. A (supplied) wired IR receiver connects to a 3.5mm port on the rear of the PA 1100 E



vocals. Engaging the Bezier filter eliminated this and made everything from cymbals and Hammond organ sound a shade more real. With other tracks, the Bezier filter resulted in greater dynamics along with improved clarity and detail. If you do decide to audition this amplifier it's crucial you explore the two filter options. As it was, the quality of sound possible via USB from PC was highly impressive and came close to equalling that available from my dedicated NDX streamer.

A variety of high-definition files encoded at both 192kHz/24-bit in FLAC/WAV and DSD64 were also used. One was the stunning performance of Beethoven's *Piano Sonatas* by Mari Kodama from HDtracks [Pentatone PTC 5186 067].

Replayed via T+A's USB DAC the tremendous scale and authority of the Steinway Model D concert grand used for the recording was in full evidence. The sense of majesty and awe this instrument conveys live is extremely difficult to reproduce through a domestic hi-fi system, but here the T+A PA 1100 E came remarkably close. It felt like listening to the master tape, and while there were subtleties of reproduction that favoured DSD as opposed to FLAC – especially in terms of the top end sounding smoother – both were far superior to plain vanilla CD. ☺

HI-FI NEWS VERDICT

The T+A PA 1100 E is a supremely flexible stereo amp, capable of handling almost any two-channel source – whether analogue or digital. Its construction is immaculate, the aesthetics understated and the whole thing feels built to last a lifetime. Its sound seems similarly robust and 'three dimensional', fully capable of revealing the emotional intent and drama of a recording. Try it at the heart of a modern system.

Sound Quality: 84%



HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	162W / 265W
Dynamic power (<1% THD, 8/4/2/1ohm)	215W / 405W / 720W / 405W
Output impedance (20Hz-20kHz)	0.042-1.18ohm (518ohm, pre)
Freq. resp. (20Hz-20kHz/100kHz)	+0.08 to -0.90dB/-7.8dB
Digital jitter (USB at 48kHz/96kHz)	75psec / 85psec
A-wtd S/N ratio (re. 0dBW/0dBfs)	77.8dB (Analogue) / 104.0dB (Dig)
Dist. (20Hz-20kHz: 0dBW/-3dBfs)	0.0014-0.007%/0.0005-0.009%
Power consumption (idle/rated o/p)	17W / 345W
Dimensions (WHD) / Weight	440x115x380mm / 14.0kg