DUAL CONCEPT

The new T+A plays as transparently as an electrostatic speaker, as voluminously as a dynamic one and with the crystal clear directness of a line array. No wonder – it's all three in one.

by Malte Ruhnke

A look inside: arranged back-to-back, the bass drivers each work out to the sides. The electrostatic tweeter and mid-range drivers each have their own enclosure. Numerous reinforcements make the structure immune to resonances.

Siegfried Amft, founder and boss of T+A, is generally a rational person. He is a physicist, after all. During his student days, he obtained from a professor by the name of Fritz Sennheiser the initial spark to devote his life to high-quality music reproduction. And since setting up T+A in 1978, he has been doing that with a demure passion. That's a fairly long time and it takes a good deal to get such an experienced man fired up with a sense of discovery.

Yet it is precisely this that you notice when you talk to Amft about electrostatic speakers. He achieved the dream of creating his own electrostatic tweeter back in 1984, calling the resultant loudspeaker range 'Solitaire', meaning in effect: in a class of their own. These were certainly fully active speakers with an integrated tube amp, however the tweeters produced a problem: the sweet spot, the area of even sound dispersion, was very small and created enormous challenges in terms of speaker alignment. Anyone sitting a few inches too high or too low was penalised with either too much or too little treble. The cause for this is referred to by electrical acoustics specialists as 'inherent directivity': if the height of a piston-type transducer exceeds the wavelength emitted, it emits a quasi-even wave with substantial focussing. The familiar way of countering this is to make the diaphragm smaller or flexible (neither applicable in the case of electrostatic speakers) or curved – which can only be done in one dimension, sensibly the horizontal one. There is, however, one further solution: to make the transducer bigger – so big that, despite directivity, its height alone fills the desired sweet spot with sound. This route is taken in the case of classic electrostatic planar speakers, such as those of Martin Logan, with which we're familiar, and it definitely works. However, the T+A team in Herford did not want to build a full-range or mid-high frequency transducer. For the one part such a design makes an open baffle type, i.e. a dipole, advisable and secondly T+A prefer to entrust mid-range frequencies to dynamic drivers, which in Amft's opinion play here with more vitality and colour, while the electrostatic speaker is meant to score with finer high-frequency resolution and transparency.

Attempts to combine a dynamic cone and a tall electrostatic tweeter did not work out. The prototype's sound unduly lacked homogeneity and the break between the two principles was too clearly audible. The most plausible psychoacoustic explanation for this is that the totally different directivity pattern of the transducer two types prevents homogeneous sound dispersion and gets perceived by the ear as an unlinearity. So why then not simply place a dynamic line array next to the cylindrical waves emitting foil? No sooner said than done – in the CWT 1000 an array consisting of six mid-range drivers in 4.5-inch format reproduces the fundamental and formant range from 200 to 2,000Hz. Because with their notched diaphragms, thus protected from partial oscillation, the cones sit so close to each other, no interference occurs, but instead the waves are added to form an almost even front, very similar to the emission of the 35-inch tall foil transducer.

In the first few listening tests the new combined speaker proved to be markedly dynamic in the mid-high frequency range. Subjectively too fast for conventional bass reflex enclosures to be able to keep up with it. Yes, from the impression gained through listening to it not even the transmissionline principle favoured by T+A was sufficiently dry or tight. A closed cabinet was needed - in terms of precision and dryness still the reference. However, so that its inbuilt drawbacks, such as limited deep bass SPL and compression chamber effect inside the volume, do not have a negative effect on the cabinet, the T+A developers devised a form of enclosure in which four woofers of the eight-inch format work in parallel. In order to minimise any vibrations transmitted to the cabinet, two bass diaphragms work to the left and two to the right, with each back-to-back pair connected by rods.

Connected: Pairs of bass drivers are screwed together via rods and oscillate conversely. Any structure-borne sound is thus almost completely eliminated.

However, as impulses running contrary to each other cancel each other out, the structure-borne sound transferred to the cabinet remains at virtually nil. Even when the speaker is doing the heftiest of bass work, you feel practically nothing if you place your hand on the sidewalls of the CWT1000.

The stable construction undoubtedly helps here: the walls are up to 45mm thick and stiffened in the key area by lateral joints and recessed struts. The electrostatic speaker and the mid-range drivers each get given their own enclosure so that they don't have any acoustic influence on each other. As I had already tested the small Solitaire model, the CWT500, for sister publication AUDIO, I knew before the listening test about the speakers' particular sensitivity in terms of set-up: select an adequate listening distance (3, or better still 4 metres) and angle the speaker in precisely! That's because the two line emitters in the speaker focus their sound waves onto a cylindrical area and are in principle not suited to fill a room completely and evenly with music. Thus set up, the CWT1000 was able to play its first few beats and showed as it did a family likeness to the small one, while being lower maintenance:Incredibly rich high- >

The terminal: top the switches for adjusting the speaker to the room. They only have a subtle (mid-range) or narrowband (bass and treble) effect. The connectors are all designed for bi-amping. The mains supply is used only for the electrostatic speaker's constant polarization voltage.

Behind bars: the wafer-thin foil oscillates between two electrically pre-charged stator grids. Reinforcements and protective circuits appear through the grid only on this photo.

frequency resolution flowed towards me as Mozart's 'Don Giovanni' (Jacobs) played, the T+A fanning out the choir and orchestra in broad, highly precise fashion. The prejudiced view that high-resolution speakers are both 'analytical' and merciless at high frequencies was skilfully countered by the CWT1000: with the transparency of an electrostatic speaker it served up the entire score and effortlessly tracked every individual voice without the homogeneity, the overall musical impression, suffering in any way at all. The fundamentals and warmth in the voices, by contrast, were instead reminiscent of the best dynamic speakers and even for the eerily low bass of Alessandro Guerzoni as the commendatore and the acoustically truly scary descent into Hell the T+A speaker shows impressive volume and adequate power in every layer. Its staging here, especially in height and breadth, was superbly exact, the protagonists moving with holographic precision as if illuminated by extra spotlights and the tendency to spatial depth was therefore less pronounced.

Everything was certainly extremely well graduated in depth, but always also a step nearer to the listener that usual. I found that I had involuntarily swapped my place in the 5th row with one on the conductor's dais. Let's listen to a group with somewhat fewer members:

Miles Davis' trumpet with its hard and sometimes cutting interjections stands in breathtaking style directly before me during Gershwin's 'Porgy And Bess', as if I could almost touch it. Snappily and with superbly fine dynamics the T+A also follows every shade of his accompanying big band and I am repeatedly surprised by details of the arrangement that I had never noticed in this recording before, even though I know it so well. The CWT 1000 plays with fascinatingly high resolution without at all putting any 'pressure on the ears'. However, it also scarcely gives the listener a breather and presents the music like a non-stop thriller.

That then calls for an appropriate record: Dream Theater's 'Metropolis Pt. 2' is gripping heavy metal with constantly rising suspense. The T+A hammers a clean belt out of its bass drivers and follows every drumbeat with the precision of a laser weapon, with the band standing before me as one, really blowing me off my feet. Even at SPLs that my neighbours would never tolerate, the CWT 1000 always remains relaxed and perfectly transparent.

That calls for something calm to finish with: a Liszt piano transcription played by the exceptional pianist Janina Fialkowska. The fine embellishments flow with agility and balance and even in the quiet, elegiac passages the T+A adapts to the music perfectly. <

Siegfried Amft, T+A Managing Director

"I had always dreamed of building an electrostatic speaker, however in the mid-frequency and bass range classic drivers sound more dynamic. Our line array system finally combines both advantages."

T+A Solitaire CWT 1000

List price: €24,000
Guarantee period: 5 years
Weight: 83 kg
Size (W x H x D):
43 x 131 x 46 cm
Surfaces: Cherry, walnut, Macassar ebony, black, white, in each case piano lacquer

Sales:
T+A Elektroakustik GmbH
Planckstraße 9-11
D-32052 Herford
Germany

Telephone: +49 (0)52 21 767600

Internet:
www.taelektroakustik.de

Test SACD

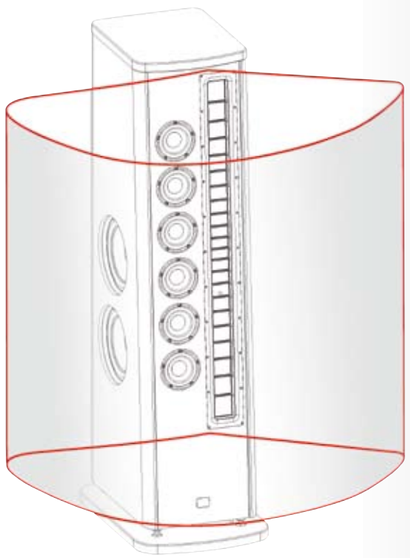
Mozart: Don Giovanni

Walking the borderline between gaiety and extreme gravity – René Jacobs catches Mozart's tone exactly. There's not so much Belcanto here, as dense psycho-drama – and superb recording quality.

The author

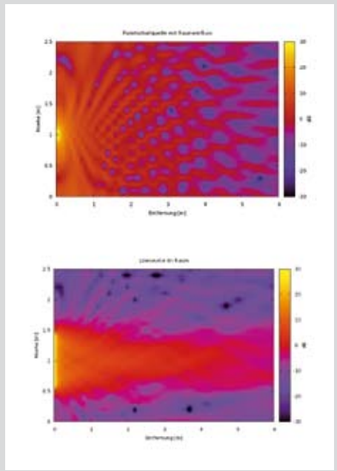
Malte Ruhnke

For Malte neutrality and realistic sound staging are the cardinal virtues and there a speaker's set-up and positioning play a major role. He planned how he furnished his living room around his already precisely positioned 4.0 surround-sound system.

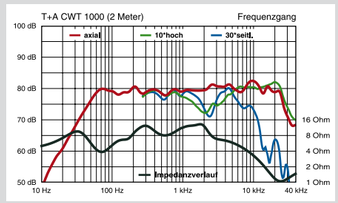


Spatial acoustics simulated: Line vs. point sound source

A point source that is as small as possible (simulation above) creates homogenous transmission (red-orange) only in the near field. Further in the room reflections, especially on floor and ceiling, cause interferences. The line array or cylindrical wave transducer practically removes floor and ceiling reflections and thus carries further and in more homogenous fashion into the room (simulation below).

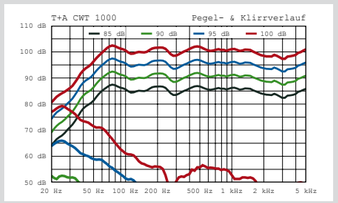


Frequency response



Only at a measuring distance of 2 metres is the CWT1000's frequency response absolutely neutral. In the near field the waves do not add perfectly. As is typical for a closed cabinet, the bass roll-off is low-order, thus subjectively seeming a lot deeper than the nominal cut-off frequency would suggest.

Distortion

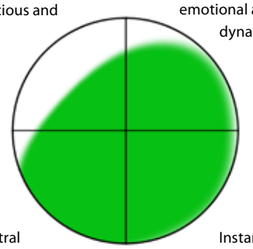


Mid- and high-frequencies are perfectly clean and show hardly any detectable distortion. In the bass range THD rises proportional to the lift, but here too remains under the audible threshold. In the listening room the speaker thus also goes appreciably louder than the 107 decibels recorded in the lab.

AUDIOphile character

Effortlessly spacious and soft

Grippingly emotional and dynamic



Neutral Authentic

Instantly high resolution

AUDIOphile potential

Recommendation

Plays superbly with almost every amplifier except small tube amps. Should be placed and positioned carefully, prefers distances of 4m and above.

by Malte Ruhnke

Made in Germany

From network player to electrostatic speaker: at T+A in Herford, Germany they like to make things themselves. And they develop revolutionary loudspeaker concepts named Solitaire.

Theorie + Anwendung (Theory + Application) – it was based on this motto that Siegfried Amft wanted to make use of the knowledge he had gained doing a physics degree to achieve better music reproduction. When setting up his company in 1978, he therefore simply called it T+A.

Latterly, the company has made a name for itself primarily with new electronic components: the classic R series, in the best tradition of design and manufacture; the V series, an extravagant combination of the latest solid state and finest valve technology; and, of course, the E and K series, which set new benchmarks for value for money and extremely simple, integrated systems. In recent years, Amft has spared no effort or expenditure in order to keep pace with the latest technologies as well: T+A is one of the few independent high-end companies in the world to have invested in its own Blu-ray player base. They are certainly among the pioneers in terms of network players, while system solutions like the Caruso are specifically aimed at demanding customers who want a music solution of the 'unpack – sounds great' variety. However, T+A's story is equally rich in terms of extraordinary loudspeaker developments. They have never been satisfied with mainstream solutions and off-the-shelf drivers. After initial experiments with public address and omnidirectional speakers, T+A was one of the first companies in the early 1980s to popularise transmission lines with a bass sound of previously unknown clarity. The great grandfather of the Solitaire series, the OEC 2000, came onto the market way back in 1984. At that time the company was putting its weight totally behind fully active speaker concepts, using a method of optoelectronic diaphragm sensoring that it had patented.

Already there: an electrostatic tweeter, above a mid-frequency dome. The model names OEC 1000 and OEC 500 for smaller versions followed and were used out of tradition for the series launched in 2011. However, the Solitaire series name is still connected to another line, above all to the legendary A2D from the 1990s. The twist is that T+A were for the first time building here a completely digital, active speaker concept with DSP filters and built-in digital inputs. By contrast in the mid-range things were done in the traditional way: a d´Appolito made up of 2 cone drivers and a dome tweeter was the centrepiece of this speaker, which was almost as tall as a man. With the top 'anno 2011' series the company is again taking the classic route: all of the speakers are designed as passive concepts. However, driver technology itself is no less revolutionary than those of their predecessors. And therefore the new series is allowed to bear the Solitaire name as well.

The first Solitaire, OEC 2000, had electrostatic tweeters and integrated valve amp for the same.

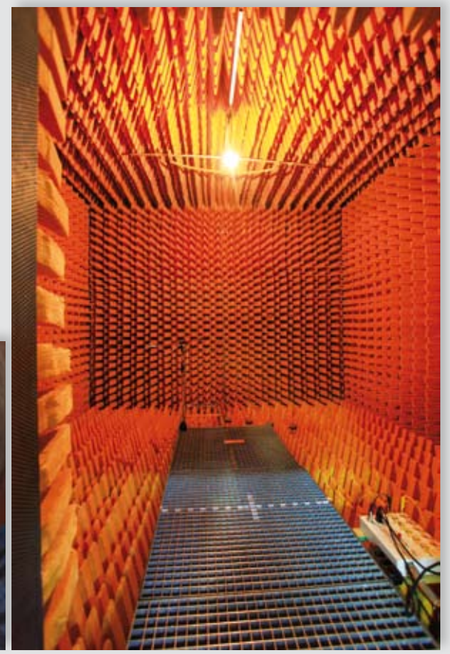
Solitaire terminals: top quality switches and sockets being assembled by hand.

A special tool helps to pull the electrostatic foil precisely over the frame.

The foil diaphragm is only five micrometres thick, seen here not yet pulled taut.

Manufacturing quality: all final assembly work is done in house at T+A. Seen here are pre-assembled units of the E series music receiver.

At the heart of speaker development: the anechoic chamber for taking measurements under optimum conditions



All on computer: cutting-edge CAD software enables comprehensive planning without any labour intensive prototype construction.

Crafted by hand: the assemblies are fitted and the wiring done totally in the traditional way. Afterwards every unit gets tested.