

# STEREO STEREO

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REPORT WBT NEXTGEN SOCKET

## MISSION ACCOMPLISHED

Wolfgang B. Thörner is on the offensive. His enemies? Interfering eddy currents and poor contacts. Around two years ago, WBT revolutionised the hifi world with its Nextgen plug. And it was only a matter of time before they succeeded in coming up with a matching socket.



"It's easy, the white plug is for the left-hand side and goes in the white socket. The red plug goes in the red socket on the right – and Bob's your uncle! Why are you hifi types always looking for problems?" This no-nonsense comment by an extremely good friend hit home. What can you say to someone as down-to-earth as this pragmatic soul?

Perhaps that, a little under two years ago, WBT's "Nextgen"

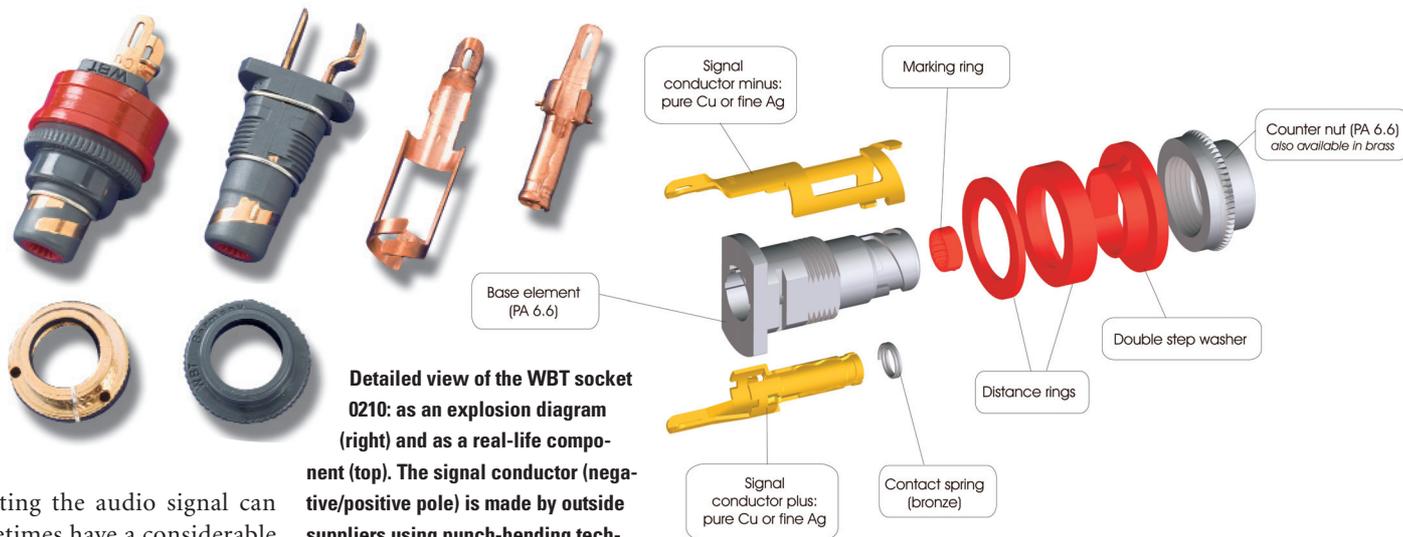
**Efficient lightweight design: Nextgen socket with socket element made of Ultramid – you can easily recognise the wave-shaped negative pole at the front.**



technology revolutionised the world of audio entertainment as completely as almost no other innovation in the sector in recent years? "What is there to revolutionise about a plug? It's not as if you can reinvent it, is it?", comes the reply, complete with a sceptical frown. Hifi insiders in general and STEREO readers in particular now know, however, that this doubter is only partly right.

It's true that Wolfgang B. Thörner, founder and boss of

WBT, didn't reinvent the RCA plug. The "RCA phono plug", to give it its full name, has been around since 1942 and is still widespread all over the world. The big drawback, however, is that its development has not kept pace with technical advances in the field of electronics. In the seventies, for example, hifi components were generally not of such a high standard that the use of high-quality cables, plugs or sockets would have resulted in any major improvement. But things are totally different in today's digital era. Tiny pick-ups



**Detailed view of the WBT socket 0210: as an explosion diagram (right) and as a real-life component (top). The signal conductor (negative/positive pole) is made by outside suppliers using punch-bending technology.**

affecting the audio signal can sometimes have a considerable negative impact on sound quality.

One of the biggest villains are the so-called eddy currents, which draw the energy out of the audio signal and can severely affect listening pleasure. Those of a more technical bent – provided they paid attention in physics class rather than gazing forlornly at the girl at the next desk – will be aware that every electrical alternating field generates a magnetic field and vice-versa. This naturally also applies to the cur-

rent flowing through the signal conductor of an RCA plug. This field spreads out cylindrically around the conductor. The metal sleeve of the socket then generates an electrical field; in other words, the magnetic field of the internal conductor induces an electrical current in the sleeve.

This physical relationship is similar to the modus operandi of a transformer; only in our case, part of the useful signal is lost.

Due to field feedback in the material itself, this decoupled part of the signal can seriously impair the process of signal transmission. So the job is to prevent these eddy currents along the sleeve jacket from having this negative effect. This is why the first component in WBT's new series, the Nextgen plug 0110, came complete with an extremely thin-walled aluminium sleeve which, thanks to its low inductance levels, "steals" only a very

small amount of energy from the magnetic field of the internal conductor.

You've probably already guessed that a great many grey cells were involved in the process outlined above – and all the effort was directed at a single goal: matching the characteristic impedance.

This parameter, one you might be familiar with from the field of

## INTERVIEW

### "We are pushing on with our research"



**All ears: WBT boss Wolfgang B. Thörner (centre) and Head of Marketing Gabriele Hofmann (l.) give STEREO reporters Matthias Böde and Tobias Zoporowski (r.) the lowdown on the innovative Nextgen components.**

(see STEREO 4/2004). Now you've developed a matching socket. Have you achieved the goal you set yourself?

**Thörner:** By no means. We're pushing on with our research, and we will soon be presenting binding posts with Nextgen technology for loudspeakers. It is true, however, that the combination of new RCA plug and socket has succeeded in creating a really homogeneous and eddy current-free connection between source component and amp for the first time. While the Nextgen plug was a great step forward in itself, the connection is only totally perfect if the Nextgen socket is in action at the end of the signal

path. The difference in sound quality can be dramatic, particularly with high-definition digital sources.

**STEREO:** How do the binding posts fit into the picture?

**Thörner:** Our goal is homogeneity and loss-free transmission from the power amp to the voice coil in the loudspeaker. Nextgen speaker terminals are simply the next logical step in this process.

**STEREO:** But the minimalist design of the Nextgens represent a complete U-turn compared to the solid feel of the famous "standard" WBTs. Weren't you worried you might alienate your customers?

**Thörner:** Alienate isn't the right word, but it certainly is true that the new product line signalled a paradigm shift that we had to communicate to the market. The trade press was of course a big help in this respect. And the "normal" WBTs are naturally still available.

**STEREO:** WBT has been a byword for superior connections of the highest quality in the hifi world for more than 20 years now. How did you decide to invest so much energy in a component that many customers – even many hifi enthusiasts – often don't consider to be particularly relevant. Surely an RCA plug is an RCA plug, no more and no less?

**Thörner:** If that was really the case, I could pack up and go home tomorrow. But the truth of the matter is that everyone – including the industry – neglected plug and socket connections in hifi systems for decades. This becomes obvious if you consider that RCA plugs have

only been really internationally standardised since 1999, for example. Just think back thirty years or so: even the latest tape recorder of the time wasn't so good that different sockets or plugs would have made an audible difference. In contrast, today's hifi components are so technically sophisticated that better cables and connectors make an immediate difference in terms of sound quality.

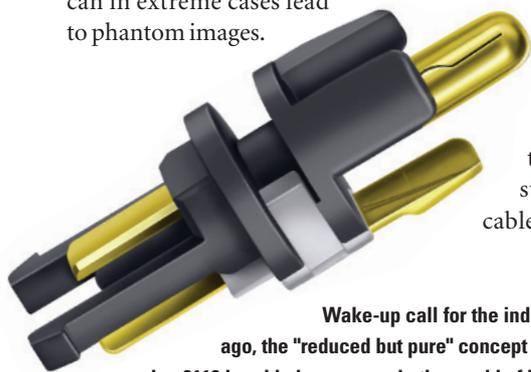
**STEREO:** Something we can confirm based on the day-to-day tests we conduct for the magazine. Mr. Thörner, two years ago you unleashed a small revolution on the hifi scene with your Nextgen plugs

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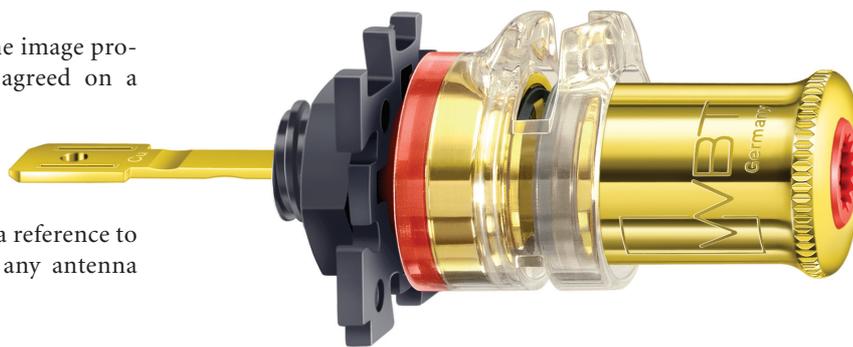
communications technology, is quite different from the "normal" ohmic resistance that reduces a voltage in an electrical circuit, with the power loss then being converted into thermal energy. If the electrical signal is not transported efficiently due to imprecise resistance matching, this results in undesired reflections on the transmission path which can wander back down the cable. In television sets – where the signals are, however, HF signals – these reflections can in extreme cases lead to phantom images.

And this is why the image processing industry agreed on a standardised characteristic impedance of 75 ohms a long time ago. You can find a reference to this standard on any antenna connection.

In the audio sector, the home of low-frequency signal transmission, no one even thought about this phenomenon until a few years ago. It was not until Wolfgang B. Thörner developed his Nextgen technology that hifi experts also fully began to realise that output stages, sockets, plugs, cables and input stages



Wake-up call for the industry: around two years ago, the "reduced but pure" concept of WBT's Nextgen RCA plug 0110 heralded a new era in the world of hifi.



WBT's latest coup: the Nextgen binding post 0710 (shown here in the gold-plated version) is soon to be launched.

harmonise more effectively with one another if they are matched in terms of impedance – and this is where the aforementioned 75-ohm standard comes into play. The new technology developed by WBT woke the sector from its slumber.

Thörner achieved this quite simply – but by no means easily – by totally rethinking the con-

ventional RCA design concepts in which both the positive pole (central pin) and the negative pole (external encasing contact) are solid components.

In WBT's 0110 plugs, the ground connection takes the form of a single thin tab, which has the advantage that it contacts the socket at a precisely defined point.

It's worth mentioning that this principle is chiefly based on a theory developed by German physicist Heinrich Hertz and

### Standard or Nextgen – audible difference?

**The Nextgen technology is superior to conventional RCA connections in both mechanical and physical terms. But what does it sound like? A direct comparison provides the answer.**

The Nextgen RCA socket is finally available, and the first manufacturers are already fitting it in their hifi components. But what are its advantages? Better sound or only better sales for WBT? It's difficult to perform a direct test, as it's hard to imagine a manufacturer fitting the necessary range of different plug and socket versions to his appliances. But we did in fact find a way – by using two switching devices each fitted with a pair of standard WBT RCA sockets as well as two Nextgen sockets. Each device had two permanently installed audio cables with Nextgen plugs to hook up to amp and CD player. As we used two HMS Gran Finale audio cables that were identical in all respects apart from the RCA plugs – cut one after the other from the same roll of cable and fitted by the same person using the same tools – we were able to set up two "stan-

standardised" transmission lines: one fully equipped with conventional components, the other with Nextgen technology. We switched between the two with zero delay by operating a radio remote control from our listening post. Critics will claim that this setup also has an effect and that it impairs the quality of the signal. And they're right, but surely it's better to compare slightly compromised sound output than to stay totally in the dark. To measure the effect, we set up an additional symmetrical test stretch from the second output of the CD player directly to the XLR input of the pre-amp running parallel to the original test line. And we naturally also used a HMS Gran Finale for this setup. If you switch between unsymmetrical and symmetrical conductors made up of iden-

tical cable types, you'd generally expect to hear little or no difference in the tweeter range. Not so with our test: the setup with the switching modules audibly swallowed up subtone details, spatial reach and vibrancy. The sound profile was slightly matt and restrained. Yet we still managed to demonstrate the difference between "WBT normal" and "WBT Nextgen". Like the plugs, the eddy current-free sockets make for a fuller sound dimension and more relaxed and agile reproduction, whereas the music produced by the old technology appeared more constricted and didn't flow quite as freely. The Nextgen

inputs also led the way in terms of tonal quality with a coherent, silky clarity. The standard sockets resulted in a slightly metallic timbre with brittle subtones. We reversed the connections (by hooking the Nextgen plugs to the old sockets and vice-versa), and the differences almost disappeared; both test routes produced almost identical sound quality.

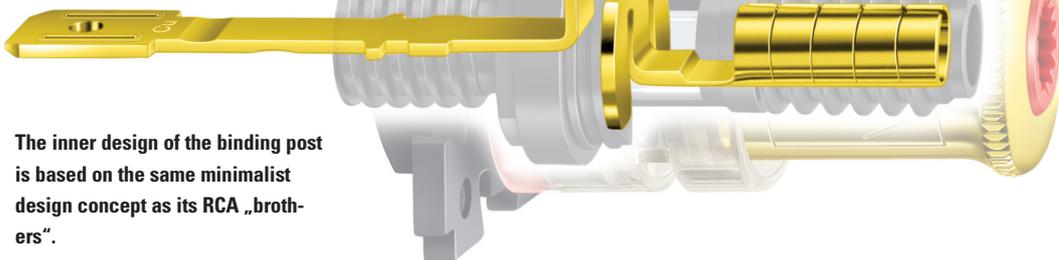
And the upshot? The Nextgen sockets really do greatly enhance hifi connections. Dear manufacturers, please follow the example of Esoteric and Soullution – and use the next generation of RCA sockets in your components.

**Matthias Böde**



known as "Hertzian pressure". Hertz discovered that two elastic bodies with curved surface – if you pick up an RCA plug and a socket, you'll understand what he was getting at – only touch each other along a line or at a certain point. The elasticity then leads to flattening at the point of contact.

A characteristic voltage distribution is created in both elements at the point of contact, and the voltage is at its highest at the centre. The "Hertzian pressure" is



**The inner design of the binding post is based on the same minimalist design concept as its RCA „brothers“.**

then calculated on the basis of the force used to press the two bodies together. And if you ever wondered what the trademark WBT clamping mechanism was for, there's your answer! With the Nextgen technology, the spring pressure of the clamping mechanism is concentrated at the ground point. There's no better way to make a contact!

In order to achieve the desired characteristic impedance of 75 ohms, the familiar solid plug elements made of metal had to make way for a sophisticated plastic design made up of three moulded components. Plastic reacts more or less neutrally to any kind of field effects, regardless of whether they are electrical or magnetic in nature. Moreover, "Ultramid" – the high tech material used in the plug – possesses outstanding mechanical properties in terms of rigidity, impact resistance and temperature resistance. Which is good news for all you DIY cable finishers out there: the last thing you need is for the expensive WBTs to melt onto the workbench as soon as you start soldering.

The Nextgen socket "0210" now available reinforces these efforts with the highly sophisticated design of its ground contact and systematically satisfies Thörner's requirement for characteristic impedance matching. The housing is also made of lightweight and extremely strong "Ultramid" plastic. The outer contact – the negative pole

– is in the shape of a double wave and is mounted on the polymer element. The ingenious geometry of the outer contact can only be contacted at a single point by the "0110" plug. The position in which you insert the plug into the socket is of no consequence whatsoever.

This intelligent design means the "Nextgen family" is also fully compatible with mass-produced components. Both the plug and the socket can be hooked up to their conventional counterparts without any problem. It naturally goes without saying that you will only reap the full benefit in terms of sound quality if you view the combination of "0110" and "0210" as a self-contained system and use them accordingly. Only then can you be sure that the connection is completely homogeneous and perfectly matched on the characteristic impedance front, thereby reliably ruling out reflections and impaired sound clarity. At the present time, it might not be all too easy for you to enjoy the full advantages provided by the Nextgen plug and socket combi-

nation, as – unlike the situation in the cable segment – there are as yet still only a few manufacturers who equip their appliances with Nextgen connectors as standard.

This was why WBT supplied us with an ingenious test setup that enabled us to compare the admittedly excellent "standard WBTs" with the eddy

over more than four and a half years, his next "Nextgen coup" is ready for series production – the world's first binding post in line with WBT's minimalist design principle which will allow a homogeneous start-to-end connection from the output stage transistor all the way to the voice coil of the loudspeaker. The "0710" will soon be ready for rollout. And then we can tell our sceptical friend with his "red on the right and white on the left" that it's high time to think again ...

*by Tobias Zoporowski*

current optimised Nextgen system. The results of our listening test were extremely interesting and are outlined in the box on the bottom left of the page.

So does this mean that Wolfgang B. Thörner has reached the end of his campaign? For the WBT boss, the answer is as simple as it is logical: of course not! Following development work

**Handmade craftsmanship is still the order of the day at WBT: a small number of highly efficient machines are used in the final assembly of the company's products (here the new binding post 0710).**

**Almost as much gold as Fort Knox (below): the WBT warehouse in Essen boasts a state-of-the-art layout and is ideally equipped to meet any customer request promptly and effectively.**



## KEYWORD

### RCA phono plug

**The RCA plug was invented back in 1942 by the US company RCA. What for? To connect up a revolutionary new appliance – the record player.**

