

TEMPORAL COHERENCE PA-030 & CA-020



After reviewing the excellent phono preamplifier of Temporal Coherence, the PA 030 power amplifier and the CA 020 control amplifier are now in the listening room. TC-products are first of all developed from knowledge and do not follow the fashion and the madness of the day in the hifi-business. The focus is on perceptual results and that quality lasts the longest. Which is why a Beam Echo Avantic DL7-35 and a Marantz 8B still wipe the floor with modern hifi of today.

The author of this review visited not that long ago a flea market, at which people, parents and kids, sell superfluous toys and other stuff which they want to get rid of. Often the money goes to charity. A vague pickup cartridge changed ownership for 12 Euros and at home, the Internet was consulted whether the treasure was comparable to a Koetsu or an Air Tight cartridge. What happens next is amazing. The impressions range from 'awfully bad' to 'the best cartridge I ever listened to'. That is impossible. When such a cartridge is correctly mounted in a fitting arm and listened to by using a good and neutral system, the descriptions of the results should lay within a limited range of each other. The reality is that many internet-authors do not apply the correct arm, do not know that an MC cartridge should not be connected to an MM input (or the other way around), that you have to adjust the cartridge in a specific way and that it helps with MM cartridges to take the capacitance into account. In any case, the majority of the internet messages is not fully reliable. The same holds true for amplifiers and loudspeakers. Listening impressions from the Internet are, in general, of little use. Your author rarely recognizes the description of equipment, which we are familiar with. As a consumer, you can be fooled. Manufacturer's specifications are also non-informative. The best and the worst loudspeaker have almost identical specifications in the folders. Hans van Maanen of Temporal Coherence clearly states that the specs from manufacturers are often non-informative. They result from measurements using test signals and as a load, a resistor is used, which is why voltage and current are always in phase. No measurements are made when a music signal is processed and a realistic load is used (loudspeaker). In the latter case, voltage and current are out of phase, which easily creates cross-over distortion in a push-pull output stage. There is also the influence of the frequency response, which can explain why an amplifier does not

provide sufficiently low frequency output or of low quality. A class-A amplifier does not have problems with cross-over distortion and a Circlotron architecture suppresses such distortion significantly too. Such 'real world' measurements are difficult to do, but they tell a lot more about the properties of the amplifier in case of overload, during the interaction with the loudspeaker, etc. Many manufacturers do not dare to present the results of such measurements or are unable to perform these. Another issue is that each designer has its own design-starting points. In practice, it is rather about the way these are implemented than the starting points themselves. Amongst audiophiles there already for decades a raging discussion about feedback. On the Internet, mostly severe pro's and con's can be read, albeit that more balanced and underpinned arguments are also present. The strong pro's and con's are not underpinned by arguments. When someone yells something without a decent underpinning, you better ignore such a story. It doesn't learn you anything and it is of no use for you.



Temporal Coherence

At TC they also have a story to tell about amplifiers. You may agree or not, but it is underpinned by arguments. In a TC design, an amplifier is build-up from individual stages, each of which are made as linear as possible. When you measure the frequency response of these individually, it is straight, but also the distortion of each is minimal. Rather logical, as you don't want the frequency response of your amplifier to be like a winding road. The individual amplifier stages are subsequently coupled and over the whole circuitry, an overall (global) feedback is applied. This is an excellent technique to linearize the semiconductors and thus reducing the overall distortion even further. In principle, there is not much wrong with feedback. It solves a number of problems, but it can also introduce other artefacts. And all the different distortions and artefacts can interact. These interactions are hard to describe and therefore hard to tackle. By implementing feedback in a specific way, TC can achieve a compromise. Theory on and calculations with feedback are correct when a number of starting points (assumptions) are fulfilled. In practice, these assumptions do not behave the way you would like these to behave. One has to design the feedback in such a way that the influence of the non-ideal properties of the assumptions create as little as possible trouble in the actual circuitry and stay as much as possible close to the original theoretical starting points, which are, in itself, correct. TC thus optimizes the feedback as good as possible. Another strategy of TC is to choose for those kinds of distortions (which are impossible to avoid completely), which are the least irritating during listening. More detailed explanation can be found on the videos of www.temporalcoherence.nl.

Matchen

The PA 030 is a power amplifier with a modest power rating, also to enable placement inside audio furniture without running the risk of overheating. To achieve this (to get the maximum output power from a modest input power), it is required to minimize the power losses. TC has found a good solution to this. It is remarkable that TC also has views on the combination of a power amplifier and a loudspeaker. This is the famous match, which has to be correct and is essential for good sound. To put it in clear terms: the perceptual experience is to a large extent determined by the load interaction between the loudspeaker via the loudspeaker cable and the amplifier. As long as its capacitance and inductance are low, the influence of the cable in the determination of the sound is minor. When all loudspeakers would be a pure Ohmic load, there would be hardly any problems with matching. But we are not that far yet. TC is able to reduce the influence of the load interaction on the side of the amplifier. Cutting corners, this works by reducing the phase distance between voltage and current as far as possible, thus maximizing the head room. The TC power amplifier can thus match with a large number of loudspeakers. Also, on the loudspeaker side, things can be done to resemble it more like an Ohmic load. Using a Zobel network, the reactive part of the loudspeaker can be eliminated and the impedance of the loudspeaker can be modified into a constant resistive load. Then loudspeakers and amplifiers will always match.



Differences in sound

When the ideal match is found, this does not mean that amplifiers 'sound' the same. The result of the combination of an amplifier and a loudspeaker depends on the load interaction, but also on (partly unknown) aspects. Think of the power supply, which should, under all conditions, provide stable, fixed voltages and should be able to provide sufficient current. Think of the

number of power transistors, but also of the maximum amount of current each of these should be able to process. Many manufacturers economize on the number of power transistors, on the capacity of the power supply and often include a current limiter in case it gets a little faster. It is obvious what negative influence things like these can have on the sound. With vacuum tube amplifiers the output impedance plays a role. This is often too high with direct consequences for the frequency response curve (low frequencies). Also the storage capacity of a (solid state) power amplifier plays a role. This is different with vacuum tube amplifiers. Because of the high voltages, these need less storage capacity. It is rather amusing to watch a whole army of enthusiastic amateurs adding additional capacitors to a vacuum tube amplifier.

Power amplifier PA 030

This power amplifier is built in a Spartan way and only has a grid voltage power inlet on the rear and an on-off switch on the front. For sound quality reasons, there is no protection of the loudspeaker outputs. A short circuit of the loudspeaker cables therefore results in damage to the amplifier. The power to be delivered is 30 Watt into a 4 Ω load. This unit has RCA (cinch) inputs. The knob on the front switches the power. The blue light is dimmed at first. After a couple of seconds, the intensity of the ring-shaped LED increases and thus indicates that the amplifiers is operational. The trick with the light is the only gimmick, offered by this set (in combination with the control amplifier). Anyone who desires colourful displays, many interesting knobs, gold feet and a flashy design should shop in China. The TC equipment is nice looking and firmly built, but lacks useless nonsense. Unsuitable to function as the ultimate eyecatcher or to make the neighbours sick of envy. The budget for design and construction has been spent completely to optimizing the electronic and thus performance.



Control amplifier CA 020

This is a line-level control amplifier. TC has an excellent phono preamplifier in its catalog, which has been reviewed a while ago. It has six (RCA) inputs and three outputs, also RCA. Two outputs can be controlled for use with the TC headphone amplifier, the TC power amplifiers or the active systems of this brand or from other manufacturers. There is also a fixed output. It can be used for connection with recorders, converters or home theater systems. The control amplifier has a small, but clear, display and can only be directed by a remote control. It is a blessing that not has been chosen to use an 'app'. The choice of the input, volume, balance, rumble filter, volume preset, dimming of the display, standby, headphone standby and mute are all controlled via the remote. Also, the input channels can be provided with a text. Just as with the power amplifier, the distortions are chosen such that these are the least irritating to the human ear. Cutting corners, this is achieved by designing the electronics in such a way that only lower harmonics are generated. Higher harmonics is to say are rather irritating to listen to. From 2 kHz on, the harmonics are already halved in strength relative to a tone at 1 kHz. From 6 kHz and above the harmonics have disappeared completely.



Listening

The TC set has been connected to loudspeakers with a bit higher efficiency. 30 Watts with loudspeakers of 82 dB is not really generous, but when the efficiency reaches above 90 dB, 5 Watt suffices to reach eventually a sound pressure level of 140 dB. By the way, not to be wanted in the living room. For the listening, top quality sources have been used. Amongst others open real masters, played using Dolby A units. Also a record player with the flea market cartridge of 12 Euros. Which performed remarkably well with a new Shibata stylus. By coincidence, last weekend the new Wadax Reference DAC with the associated Reference Server has been worked with. A more expensive set, but then experiencing how digital files can perform, you develop a novel reference frame for naturalness, transparency and drive. The TC set claims to have very low distortion levels. Then you cannot start listening with streaming content, knowing that the digital code is distorted by compression and other questionable interventions. The TC set does indeed sound clean and pure. What is remarkable, is that the sound can be very detailed and subtle. The sound is neutral. There is no sharpness and the midrange sound lovely. The spatial reproduction is dramatically good. The focusing is excellent and dynamically, the set can belt out adequately. Listen, for the latter, to Formidable! (Channel Classics) at which Thomas Oliemans makes enormous dynamic jumps. Also, the low frequency response sits at a high level. The TC set has a high level of performance. All in all, an impressive list, which is certainly not achieved by every amplifier (combi or integrated) in this price range. For many hifi-friends, this can be a set, showing many perceptual properties at a high level. On the other hand, there is also something to wish for. Some sets go a small step further in the deeper harmonic sound development and an intrinsic power and drive behind the sound, increasing the impression of realism.

Epilogue

The TC set, consisting of the CA 020 control amplifier and the PA 030 power amplifier performs at a high level. It is a solid state set, which in no single way shows the disadvantages of many semiconductor amplifiers. The translation from the source to the loudspeakers is done in an as transparent way as possible. This is a major achievement and this can not always be found with the usual suspects in this budget class. The set offers a combination of many desirable properties. Of course, a scale up is possible. Even when an amplifier costs 80 thousand Euros, there is something to wish for. This is inherent to the hobby and the Creation. What the TC set obviously is not, is the ultimate eye-catcher where a visitor immediately after entering is attracted to and, totally intimidated, is ejected out the comfort zone and will have to spend the rest of his life to live with endless envy. Then you comfort the cocks, the noisy ones and the ego trippers. Such a mindset usually ends at the shrink, who will kindly point at the real essence of existence and will advice the TC set as a part of the therapy. No, TC has spent every penny in the achievement of the highest possible sound quality. Which should be the most important for the real music lover, isn't it?

Ruud Jonker



Temporal Coherence PA 030 € 2195,-
Temporal Coherence CA 020 € 3350,-