A pleasant experience

Temporal Coherence phono cartridge amplifier

The great success of vinyl has resulted in a wealth of novel turntables, cartridges, phono amplifiers, accessories and, of course, records. Classical brands like Perpetuum Ebner, Thorens, Elac, Technics and Garrard resurrect and the vintage turntables are in great demand. Which is why this time a phono amplifier of Temporal Coherence, a Dutch company, is reviewed.

Temporal Coherence is known from its loudspeakers, based on the principle of circumferential radiation. The company also builds amplifiers, among which also a headphone amplifier and recently a phone stage. There is a close cooperation with Hepta Design Audio and the products of both designers and manufacturers are, a.o., demonstrated in Westzaan. Temporal Coherence has a focus on active loudspeaker systems and, logically, on the match of the different components in an audio system. Active loudspeaker systems have advantages. One can finetune the amplifiers fully to the properties of the drivers and one is relieved of all kinds of problems the loudspeaker cable brings. Like some other manufacturers of high-end loudspeaker systems, Temporal Coherence emphasises the temporal response of a loudspeaker system. Time correct systems sound more natural and more real. Hans van Maanen has its own way regarding the development of electronics. He regards feedback as useful, but only if certain conditions are fulfilled. In order to keep full control over the feedback, the amplifiers are build using discrete components. Regarding distortion, it is noted that higher harmonics are not masked by human hearing and thus have a detrimental influence on the sound quality. The apparatus, build by Temporal Coherence produce therefore as little as possible higher harmonics. Last-but-not-least, much attention is given to the power supply, as this also has a major impact on the quality of the sound reproduction.

Phono Amplifier

This amplifier for Moving Magnet (MM) and Moving Coil (MC) cartridges comes in a metal housing and a separate power supply. The inputs for MM and MC are separate (RCA). Switching is done using a knob on the rear panel. The amplified signal leaves the amplifier via an RCA connector on the rear panel. The front panel includes a gain control (-6, 0 and +6 dB). Another switch determines the input impedance for MC elements (50, 100 or 200 **Ω**). The MM input has a standard value of 47 k**Ω**. All switching functions are realised using gas filled miniature relays and the electronics are build up fully discrete. LED's on the front panel indicate the status of all available functions. It can be assumed that records are cut according to the RIAA characteristic. It exists since 1955. Before that time, each record label had its own characteristic. Vintage preamplifiers had a significant number of settings for the most common curves of those days. Think e.g. of the well-known McIntosh C8 record compensator, but also of preamplifiers of Leak, Quad, Fisher, etc.

One who owns much vintage vinyl should have such a preamplifier to play back different records using the correct curve. The basic problems lie with the low frequencies and the record noise. To record low frequencies on the vinyl surface, one needs a lot of space. So these are recorded with a small amplitude and thus require less space. At playback, these are more strongly amplified. To suppress the record noise, the higher frequencies are more strongly amplified at cutting the record, so at playback these need to be suppressed and so is the record noise. This is all prescribed in detail in the RIAA curve, which leads to a nicely linear response. But unfortunately, the choice of the time constants (corresponding to 50, 500 and 2120 Hz) was not really ideal, which makes that phase errors are easily introduced in the midrange. This was probably not an issue in 1955, but nowadays it is. Which is why the precise implementation of these frequencies is of utmost importance for the quality of the reproduction. The RIAA network is mostly implemented in an active feedback loop. A design to which many papers have been devoted and discussions were about. In the '60's to the 80's, there was virtually no audio-journal which did not publish frequently on the pro's and con's of this approach. To achieve the higher accuracy, the RIAA network is located in two passive networks in this phono preamplifier.

Critical

With the comeback of vinyl, all the issues from long ago reappear and these are completely new for the generation, which only plays music using the ‘play’ button on a screen. Who still knows how to adjust a turntable or to set a tape recorder? The generation, which grew up with these is in their 90’s and you have to drag them out of the old age home if you want to install a new phono cartridge and have it adjusted. Anyway, the playback curve should be identical to the curve, used to cut the record. Therefore, Hans van Maanen wrote in 1971 (Elektuur) a critical paper on the shortcomings of the RIAA implementation and the workings of a number of widely used (active) basic circuits of those days. Hans gave in those days already attention to the phase relationships and the separation of the time constants has been used. It is interesting to know that Stanly Lipshitz published a paper in 1979 for the AES, in which he conceived a number of solutions for the so-called active RIAA circuits. A basic idea behind his theory is to adjust the values of the feedback components. This will lead to a much more accurate result of the equalisation curve. But one can also criticize this story, because Lipshitz made several assumptions in his design model. He e.g. assumed that the voltage gain of the different stages is constant and that only the impedance of the feedback network is frequency dependent. It gave, at least, rise to a lot of theoretical thinking. Hans offers, in his paper, a design using separate transistors. This minimises the noise. In those days, low-noise opamps were hardly available. Only the UA 741 (Fairchild, David Fullagar, late ‘60’s) and it was banned from all (audio) electronics. By the way, the original, (in)famous vintage 741 is still available. The original RIAA specification used three time constants (IEC 60098). It was adapted in 1976 and a fourth time constant was added. The idea was to suppress inaudible low frequencies (6 dB/oct. below 20 Hz). In this way, the fundamental cartridge-arm resonance was no longer transferred to the following amplification. Naturally, this amendment led to severe discussions.

The phone amplifier at the X-fi High-End audio show.

Four time constants

All the advantages, which follow from theory from the above mentioned paper of Hans, are included in the design of the novel Temporal Coherence phono amplifier. Still build using discrete components, this time using four time constants, divided over two passive networks. The advantage is that there is no influence of feedback, that the phase characteristic is maintained and that, of course, the frequency characteristic is followed as accurately as possible. In any case, it is great that the discussions of days gone by are revived. The difference between tubes and solid state. Opamps or discrete transistors. Vinyl or digital. One more step and we will be busy with equalisation and bias settings of cassette tapes and the discussion on Dolby B and C will be back. A completely new world for young music lovers, who just got used to streaming and in-ears. But the essence is listening. Time to connect the Temporal Coherence phono amplifier.

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Listening

The phonostage was listened to using a full professional and large active studio monitor system. Completely neutral, linear, a controlled radiation over the entire frequency range, no limitation in dynamics and with a great coherence between the drivers. One can also listen down to the noise floor. One can hear exactly how the music has been recorded, but also the properties of anything that is attached. Revealing, killing and one gets the answers one is looking for. Listening to vinyl uncovers that the Temporal Coherence has a certain clarity and can sound very detailed. The spatial reproduction is very good and regularly, sound is presented far outside the left or right loudspeaker. The stage is thus wide and deep. This Temporal Coherence can operate with subtility, is very detailed and is strong microdynamically. Macrodynamically, there are phono amplifiers on the market which go a little further. There also amplifiers which present the sound image a little richer and with a bit more weight. But these are naturally ‘shades of grey’. Striking is that this Temporal Coherence Music shows a certain ease in the reproduction. Music is given a certain ‘flow’. This might be caused due to the elimination of the influences of feedback on the RIAA correction curve.

It is certainly very pleasing. Music acquires a certain liberty.

Epilogue

Getting to know the Temporal Coherence phono amplifier was a pleasant experience. The strong properties of this design are the exquisite stage reproduction, the beautiful detailed sound image and the presence of a certain ease in the reproduction. Call it ‘flow’. Technically speaking, the apparatus is built very finely and solidly. It is build using high quality discrete components. The life expectancy is therefore high, the apparatus is easy to service and the price/quality ratio is excellent.

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Price Temporal Coherence phono amplifier
€ 2995,-
(Can also be demonstrated at Audio 21 in Heerde, Netherlands)

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