Temporal Coherence Diamant
Active loudspeaker system

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The name Temporal Coherence buzzes around for already quite some time in The Netherlands, but I was not able to get into contact with the active loudspeaker system, made by the company. I did encounter their amplifiers, which happen to be identical to those in the active system. So I eagerly accepted the invitation for a listening session at their premises, lucky me, because moving the loudspeakers to my condominium would have a bridge (or back) too far. So it happened that I could listen, together with the designer, on a Friday morning for a couple of hours to the system.

The company Temporal Coherence is a cooperation between the designer Hans van Maanen, developer Ron Eijling and music lover Ton Nahuijsen. This triumvirate approaches music reproduction from a physics point of view, Hans van Maanen is a physicist by training, so their designs have a clear scientific underpinning. The company has a philosophy which fulfils a number of rules. First of all, the holistic concept, meaning that electronics, loudspeaker(unit)s and housing should never be looked at in separation, but only as a unit in which the components are fully tuned to each other. The second pillar is the radiation pattern, which is a 360 degree circumferential pattern for all Temporal Coherence loudspeakers. This is achieved by positioning the units horizontally and reflecting the radiated sound on cones. Next comes the design: the end results should fit in a living space. A separate issue is minimisation of the distortion, where the measurable distortion is less important than the audible distortion; the loudspeaker is optimised for the human hearing and not for measurement results. Most important in the whole of the concept is the timing aspect. People do not hear, based on frequencies, says Hans van Maanen, but on the basis of time. When e.g. a piano or a percussion instrument is not reproduced time correct, it will never sound naturally. The primary attack determines to a large extent the sound of those instruments. Although the basis of the company was already laid in the ‘70’ies, it has gained speed six years ago because the three partners have more spare time available for Temporal Coherence itself. Lots more information about the company, its philosophy and their products can be found on the website of Temporal Coherence.

As the construction work by Temporal Coherence only includes combining the cabinets and the amplifiers, they outsource the building of the cabinets, the etching of the empty printed circuit boards and the machining of the metal parts to separate companies in The Netherlands. As indicated, Temporal Coherence makes two active loudspeaker systems, the Pyramide and the Diamant, to which I will listen today. They also have a control amplifier with six inputs, two variable and one fixed output, in which volume and balance are controlled using resistor banks and relays. The power amplifier, which can also be acquired separately, is exactly the same in the Pyramide and the Diamant. Finally, a headphone amplifier is available. The Diamant is the largest system and costs from € 45 000,- for a stereo set. The lowest part of the Diamant includes the amplifiers, as can be seen from the cooling ribs at the rear. In the lowest part a 25 cm woofer is mounted horizontally, which radiates its sound on a diamond-shaped body, which is the housing for the squawker at the same time. The midrange unit radiates via a round cone into the room, a cone with on top an equally shaped counterpart so the downward radiating tweeter can use it for its sound. The topside of the Diamant is a seven sided housing, in which the tweeter has found its home. The different parts are connected by metal rods. The drivers have been specially selected for the Diamant and have rarely been modified, albeit that the ceramic tweeter has been replaced by a softdome. Using the diamond-shaped housing of the midrange and the cones, the loudspeaker becomes a circular radiator and will behave approximately as a “sighing sphere”, the most ideal shape according to Temporal Coherence.

There is no sweet spot, sound will never stick to a baffle and the direct and indirect sounds are far better balanced. In former days, spherical loudspeakers did exist, but the application of many small drivers resulted in significant limitations.

To drive each unit, a separate amplifier is used for each unit, even two for the woofer in a bridge configuration to get four times the power. This is required because the Diamant has a response down to 16 Hz. The woofer is fed with lots of power due to the compensation circuit, part of the electronic filter. The design of the system is largely based on computer simulations for the basic design. The outputs of the different amplifiers are loaded with an almost ohmic load because Zobel networks, parallel to the loudspeaker units at the outputs, maintain the same phase for voltage and current. This is very important, because exactly such phase shifts sometimes create havoc in amplifiers. And although they perform on paper very well with a pure ohmic load, under realistic conditions little is left of this performance, I know from experience. Temporal Coherence does not only pay much attention to the amplifier circuitry, but at least as much, or even more, to the power supplies. The three-way cross over filter works purely in the analog domain and includes more than 100 transistors, it is a kind of analog computer which is hard wired pre-programmed. This could also be done digitally, but Hans van Maanen remarks that digital always has issues with the timing of the data, synchronisation and round-off errors. Working with analog filters also has its drawbacks, but those are small, compared to the digital problems. This advantage is mostly the time response. The filter works in such a way that the errors, which will be generated further down in the chain of filter-amplifier-driver will be corrected in the basis (so actually in the filter). Relative to the mid-range, the low and high frequencies can be amplified or attenuated by means of controls on the rear of the Diamant.

We hear in time and not as much in frequency, says Temporal Coherence. All information coming from the loudspeaker has to arrive in time at the listener. The attack, the tone and the decay of the tone. Therefore, the amplifier needs to be very fast and the final result will be that even a dynamic loudspeaker sounds like an electrostatic in the mid-range. I get the opportunity to judge whether that is the case with first a piece of the Beatles, this time a capella sung by the six-toned voices of The King's Singers. The first thing that strikes immediately is the total absence of a loudspeaker in the stereo image. Of course, these are standing there. But because the singers are completely detached, a very realistic image is created, to which I always have to get used to. Circumferential radiators behave differently than the systems which most of us are used to, a baffle with units below each other. The Diamant has to be placed at least a meter from the wall because of this circumferential radiation. When we continue with a quartet of singing men, I get already more accustomed to the Diamant and I can acknowledge that the voices are so pure that these seem to come from an electrostatic loudspeaker, but in this case not from a point source but from the room itself.

The continuation is impressive. A Stockfish recording of percussion reproduces kettledrums which go realistically deep in the low frequency range, with an almost unlimited ease and very dynamic. When more percussion instruments join, it shows that the attack of the drum is approaching reality very, very close. Sparkling high is coming from a triangle. I would not buy the music, but it is a recording which can demand the utmost from a reproduction chain. At least as impressive is an organ recording of Bach. Forget about the walls and the ceiling, this simply goes beyond. The low end is well controlled and goes very deep, but it is mostly about the majesty, the absence of resonances and the naturalness which are the most impressive. Those who like to go into churches to listen to organ music will see a dream come true with a Diamant in their own home. More classical music by an orchestral work, composed by Rimski-Korsakov, on a recording from Reference Recordings. The first thing you forget is that there are loudspeakers standing in the room because the stereo image is placed in the room, detached from the loudspeakers. It is so unreal that I listen with my eyes closed and only when I open these again, I realise that there are loudspeakers standing in the room. You simply forget their existence by listening to impressive kettledrums, or rather the true to nature like

sound and the ease of reproduction of all instruments. Completely free of stress. The Concertgebouw Orchestra can be heard on a Polyhymnia recording. With lots of special information and well defined placing of the instruments. Again, placed in a natural way, continuing deep to the rear in the stereo image, sometimes the soloists come a bit more to the foreground. All instruments can be identified perfectly, yet together they blend into a permanent harmony. Also with “Klavierkonzerte Nos. 182 Totentanz” on an old DGG recording in which the grand concert piano plays together with a large orchestra, I keep the feeling to sit in a concert hall and watch the stage all the time. The grand piano may play at a very low level, sometimes hardly audible, to strike at maximum level with the orchestra. The dynamics of the Diamant seem unlimited, what will also be caused by the direct coupling between the amplifiers and the loudspeaker units, without an interfering cross-over filter in the signal path to the loudspeakers as is always the case by non-active systems.

Up to now, I listened to classical music, but can the loudspeaker also perform with pop music? The first CD which disappears into the SACD player of Denon is “Hell freezes over” by The Eagles. It is a live concert, but because of the distance between me and the loudspeakers I do not get the impression to be engulfed by the public, yet to be close to the stage. This creates a contradicting feeling of “being there” and “keep your distance”. Again, no criticism is possible on the reproduction itself. To the point and fast, so the acoustical instruments sound precisely as they are. All the singing is perfectly understandable, also from the backing voices. We continue with Pink Floyd, from “The final cut” we play “Southampton Dock”. Which becomes a kind of sound painting with gulls and ships, all placed in the depth on the background, while the singer stands in the foreground. Thanks to the low the speakers can reproduce, the music is supported by a foundation and this gives tranquillity and a natural realism. A barking dog is heard in the background. Very soft sounds do not disappear in the background, below whispering level these are as good in the picture as with full blast on the mixing console. It remains a weird experience to see speakers you cannot detect with your hearing. They disappear all the time, independent of the kind of music or recording, something which is uniquely mastered by circumferential radiators. During the live recording of “Dire Straits” (Alchemy), I am placed far more between the public than a while ago with The Eagles. “Once upon a time in the West” is a sometimes brilliant recording, at other moments just very messy. Together, this give an intimate live feeling. The recording of Dire Straits also shows that the system can play at a high sound pressure level without limitations. The impressions remain the same, independent of the kind of music: there is space, naturalness, music is carried, it plays without stress and with unlimited ease.

To close the listening session, we use Norah Jones’s CD “Don’t know why” which I find boring and quickly bugging on many system, but not on this system with the SACD as the source. I hear a beautiful intonation of her voice with the band nicely placed around her. Nice and supple at a sound pressure level which will approach reality. She may come even a bit more close, a matter to move the bench a bit forward. Maybe this is the time I heard Norah the best in a living room environment. An oh so nice finish which will stick to the ears in the car. Too bad that only a listening impression is feasible, but the systems are too large for my listening room. Because of the consistent impression with all kinds of music this is not a problem. It is more than obvious: the Diamant is the result of much thinking and many listening hours. A demonstration at the premises of Temporal Coherence (or at Hepta in Westzaan for the stand-alone amplifiers) can always be organised by appointment. The loudspeakers are delivered directly to the customer without a dealer in between. To me, the holistic approach is the right choice, the cooperation between the mechanics and the electronics results in a total, which is more than the sum of the parts. Temporal Coherence knows how to solve the limitations and the deviations, coming from the loudspeaker units by the laws of physics with their own analog filters and their own amplifiers because these are designed for the units. Power, required to reach down to 16 Hz is with modern transistor circuit no longer a problem and that aspect is also used to the full. It takes a bit of time to get used to a circumferential radiator, after that, the way back to a more conventional system is a tough job.

Prices:
Diamant € 45.000,- per pair in all RAL colours.
Pyramide € 30 000,- per pair (standard version in all RAL colours), stainless steel foots optional.
Optionally veneer , but note that the Diamant has too many sides or the optical effect of veneer.

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