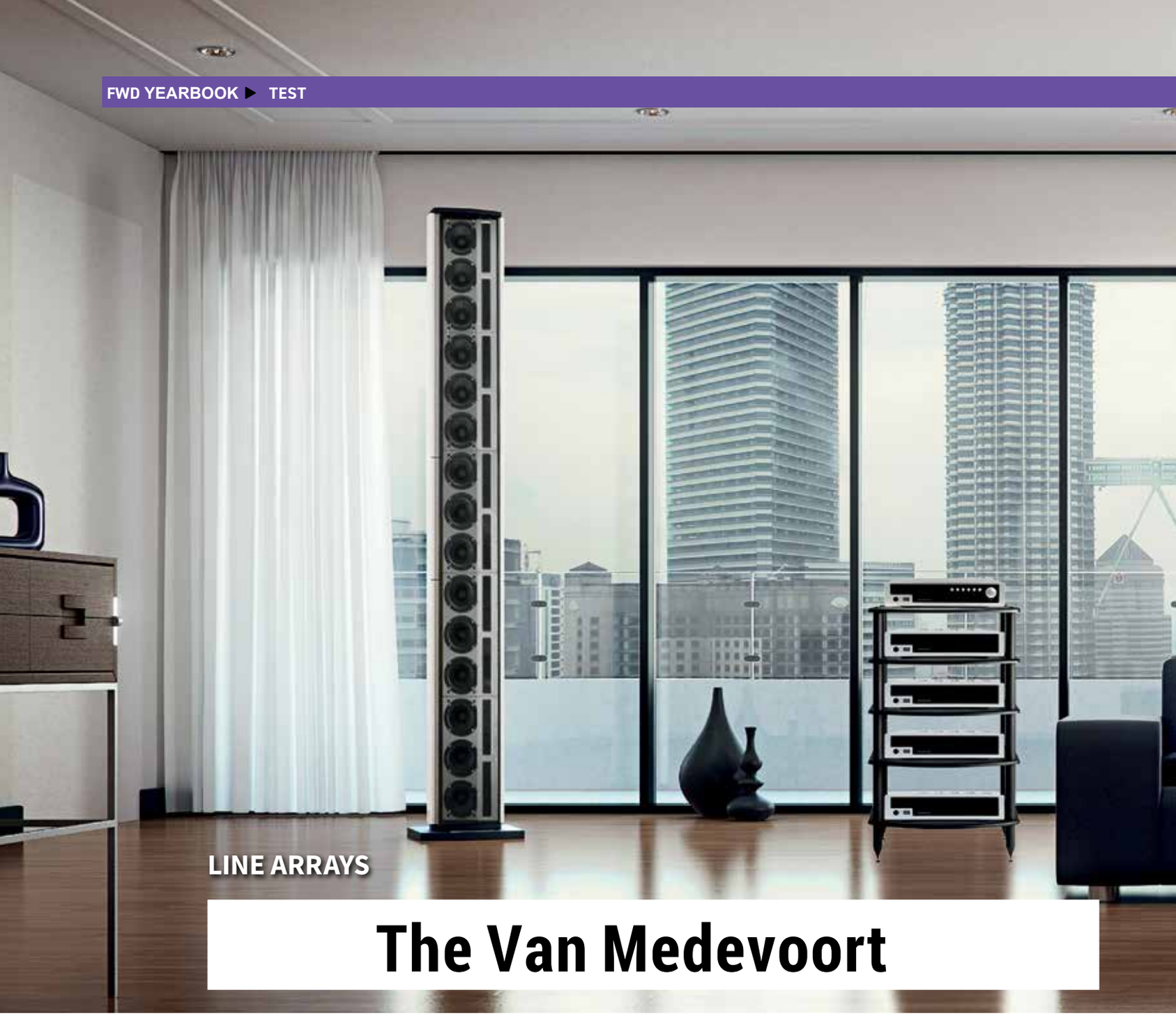
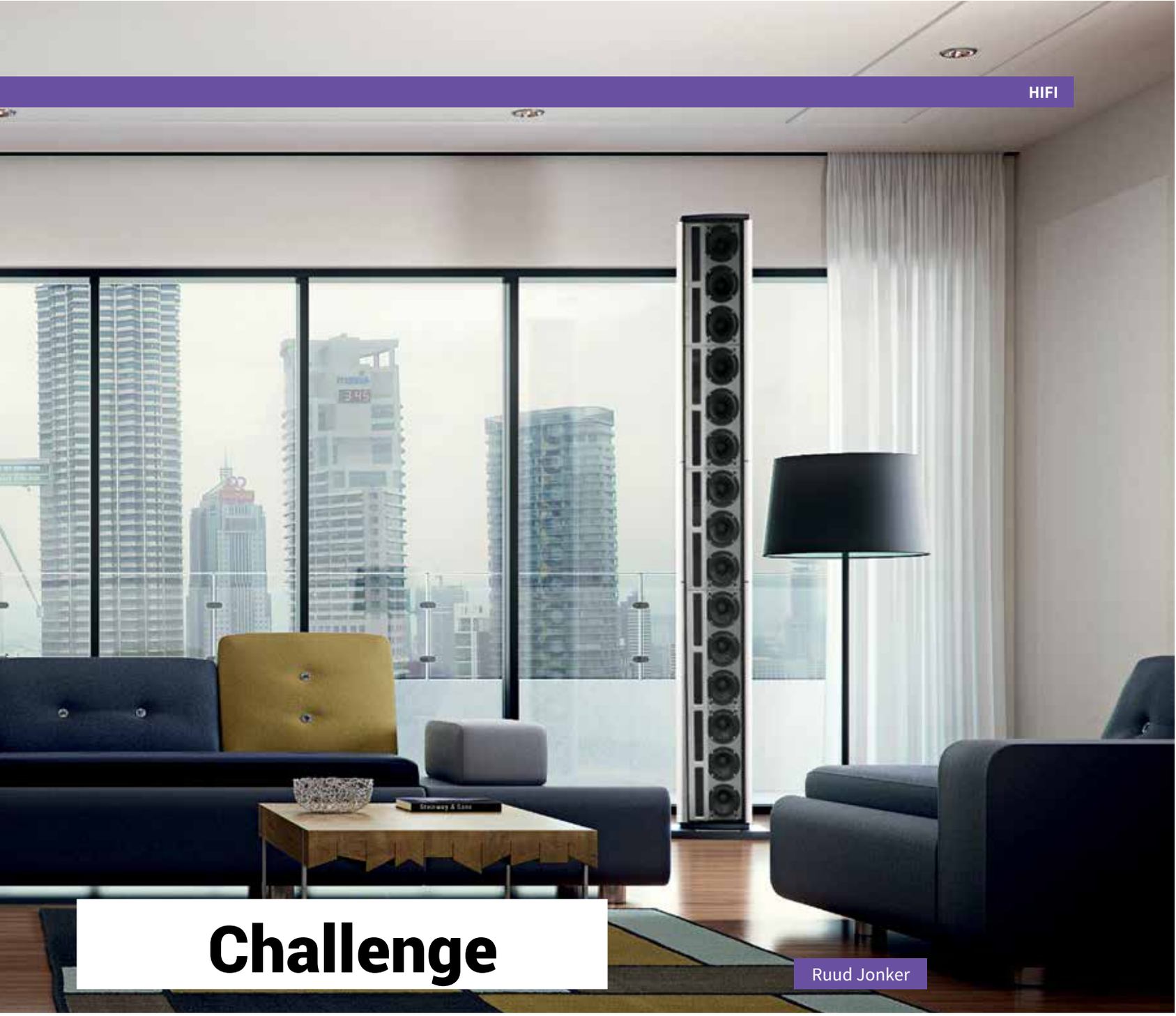


LINE ARRAYS

The Van Medevoort

This time an article and review about a setup that is 'out of reach' for most readers of FWD, but equipped with very affordable amplifiers. Anyway, you buy a car magazine to read about the new Ferrari and a watch magazine to marvel at AP's new blue ceramic Royal Oak. The reason for this article was a statement by Ad van Medevoort. The challenge was accepted and so here is a report of this thrill ride.

Your author has been fascinated from a young age about how you could achieve the most real and realistic reproduction possible with audio equipment. Within the then social circle of (studio) colleagues and music friends, all the necessary systems were built themselves (that fitted in with the era). For example, a three-way horn system with housings as large as linen cupboards, or the also quite oversized horn system with a with a servo-controlled JBL 18-inch woofer for the low end. Digital playback for the home did not yet exist, so the source was a LP from an Era/SME. You wouldn't believe how extremely realistic the Dutch Swing College Band sounded on the very spacious attic floor where that three-way horn loudspeaker was located. The physical dimensions of the band were also closely matched during playback to the band in a live setting.



Challenge

Ruud Jonker

Around that time Arnie Nudell became active with his immense line array systems. Nudell worked for an organization that built military navigation systems. That's where the idea of servo-controlled woofers comes from. The essence of this is that you can reproduce very low frequencies with a lower distortion through that servo and that from a smaller housing. In 1978 Nudell came up with the Infinity Reference Standard (IRS). Not only the servo control was new, but also the developed magnetostatic drivers and the application of the line array principle. The IRS was the first loudspeaker to use this technology in the form of a line array for the hi-fi market and was considered the best loudspeaker in the world at the time. Not surprising that Infinity caught the attention of your author in a huge way. Line arrays are used in professional audio to provide sound for large-scale concert venues. They are called 'flown' line arrays and due to the enormous scope of the sound, which you can adjust in the vertical and horizontal dispersion plane, you can offer groups of audiences in such a large stadium a powerful and high-quality concert sound. You can accurately target the sound to any segment of audience. Infinity realized the line array principle within the high-end and thus brought these loudspeakers into the living room. The professional PA sound, provided by line arrays, was not yet of top quality in those years. Nowadays yes. Many modern line arrays are superior to any hi-fi loudspeaker, but it takes some dedication, motivation and discussion with the housemates to attach a flown line array to the living room ceiling. The various IRS models and the line arrays from other manufacturers are optically suitable for the living room, but in practice often find their way into specially equipped listening rooms. Experience with those line arrays has provided the undersigned with an aha experience. Realistic reproduction is more within reach with these types of speakers and by definition with larger speakers. You know: there's no substitute for cubic inches..... ▶

LINE ARRAY

Basically, a line array consists of several vertical rows of drivers. A line array often has a height of 1.80 to 2.70 meters. It is often a panel (open baffle) or closed housing with ten or more tweeters in a row and also a row of ten or more midranges. Some systems then consist of four towers for stereo, with the two bass towers as an example having four to six 12/18-inch woofers in a row. Physics teaches that such a loudspeaker must be higher than half the room height, otherwise the system will not work as a line array. The advantages of a line array are that such a system produces virtually the same sound pressure at a living room length of 10 meters as at a distance of 1 meter. That is different from 'ordinary' speakers. The drivers of a line array also have a huge surface area together. The area of the tweeters can be 40 times larger per side than that of the single tweeter from a normal floor standing three-way.

So an enormous amount of air can be set in motion and that contributes to a realistic experience of the music, with a lot of dynamics. Due to the larger surface area of many identical drivers together, they individually have to make a smaller excursion for the same total sound pressure and the distortion, which arises from the non-linear behavior of the drivers, is enormously smaller. Because the drivers are mounted with a very short spacing in the housing, radiation coupling is created. Due to the number of drivers and the mounting, a very large acoustic power is created. A line array easily achieves a sound pressure level over the entire frequency range (from 10Hz) of 140dB.

Most line arrays are driven by active filters and multiple pairs of power amplifiers. However, modern versions can also be fully active with a (class-d) power amplifier per group of tweeters and/or woofers and possibly a dsp. But, you don't necessarily buy a line array to make an amount of noise. This can be done more easily and for much less money. Line arrays can reproduce the full frequency range, can sound extremely detailed and subtle, have enormous qualities in the low end and are often lightning fast. A disadvantage may be that they are large systems. So they come into their own in a large room, but the nice thing is that a line array can also achieve excellent performance in a small space and that you will have very few acoustic problems. In contrast to point sources, which trigger all kinds of room modes. Anyone who reads the theory will come across all kinds of objections (advantages and disadvantages) regarding line arrays. That is the same for any other loudspeaker principle. But, there is a difference between the theory and the way the implementation is from the real speaker.

Your author has lived with various line array systems for a very long time. That showed that you are working at the limit of the possibilities for system tuning. It is a hell of a job to put together such a system so that it performs in the most perfect way. You really run into yourself several times. Secondly, it teaches that it is a great experience to listen to such a system. Nothing beats the reproduction of Alte Kameraden, performed by the Marine Band Of The Royal Netherlands Navy and played from the analogue master tape from 1957. But, also listen to the largest pipe organ in the world (Convention Hall, Atlantic City in New Jersey) . Especially when Felix Hell goes wild with Liszt. Listening to a drum kit is one-on-one live. Those drums are simply in the room. Listening to Jean Michel Jarre is a huge experience, just like modern dance music and recordings of the Vienna Philharmonic. A large loudspeaker and a line array in particular bring the holy grail closer, but it still remains a (very believable) illusion of reality. A real fetish from this author

THE CHALLENGE

The Van Medevoort PA472 Dual Mono power amplifier was previously tested (October 2021). Such a device consists of two completely independent amplifiers on the same chassis. Sublime performance, especially in light of the asking price. After such a review, there is always a discussion. How many responses did the review receive? What are the customer comments? How many dozens of products have been sold based on such a review? An important question was whether these Van Medevoort power amplifiers can also drive so-called difficult loudspeakers. Line arrays soon came into the picture, because Van Medevoort itself also has two such systems in its catalogue. The vM RDQ (dynamic high) and vM REQ (electrostatic high).

Subsequently, a location with a line array that would be available for the experiment was sought within the social circle. Van Medevoort has specially built four vM PA471 monoblocks for this. The 2.40 meter high line arrays belong to an owner who does not want to be publicized. The pictures of line arrays in this article are general pictures, to give the reader an impression of such a loudspeaker and what the listening system might look like. There are still a number of suppliers of line arrays within the hi-fi market. It is a niche market for real music lovers. The towers of the line array in question are normally driven by four amplifiers of approximately 1600 Watts RMS each. In doing so, the system already reaches a lower frequency in the vicinity of 18Hz.

The filter units of the system have a third line output to which infra subwoofers can be connected. There are two subwoofers with 4 kilowatt amplifiers on board, but they have not been used. The owner does have an extensive collection of preamplifiers. The Van Medevoort PA471 power amplifiers are extremely neutral. With the help of the choice of the preamplifier, the speaker cables, the power cables and the interlinks you can still fine-tune the sound and the match. Some line arrays come from the factory with fixed corresponding amplifiers for the bass. Like for example the Genesis 1.1. But, then the additionally required power amplifier must of course match the panels with the mid/high drivers. The goal is simply to get as close as possible to the properties that characterize live sound. Almost every recording engineer in the classical or jazz world knows how instruments and voices sound 'in real life'.

The challenge is simply which equipment and cables to select to get as close as possible to that ideal image. In the early years, when the IRS systems from Infinity were used in the listening room and experience was also gained with various Genesis models, that was a thing. In addition to that match, these types of systems also have all kinds of settings. Building and perfecting systems at this level requires a great deal of knowledge and time. But persistence wins and critical perseverance is helpful. There are only two possibilities. Either the system ultimately plays in full perfection or it is a lot less. Compromise is hard to live with. So the motto is: it's either perfect or you just stop. But not anything in between. The Van Medevoort amplifiers match very well with the line arrays. The path to perfection was ultimately determined by the choice of preamplifier. With systems at this level, where you literally hear everything and you hear every mistake back, it's a factor that is sometimes subtle, but ultimately determines the small differences on the way to the holy grail. The amplifiers were equipped with the excellent vM power cables (SC QP) and interlinks (SC QS).

TRUE SYMMETRICAL AMPS AND POWER

The visitors of the Dutch Audio Event 2022 were able to get acquainted with a real line array. In the room of Hifi Corner Trading there was an almost complete line array, made up of Lyngdorf Audio Line Source System elements. Like any audio show, maybe not quite perfect, but an absolutely incredible and thrilling experience. Back to the line array. The four amplifiers of the line arrays were replaced by four times the vM PA471. The latter are lighter and take up less space than the huge power amplifiers that these arrays are normally driven with. The completely discrete vM PA471s are ground breaking, by the way, because each amplifier delivers about 450 Watt to an 8 Ohm load. There is a heavy power supply on board and the amplifier is completely symmetrical. Often mono amplifiers are a bridge version of a stereo block. The amplifier then needs a phase shifter. Such a bridged version is never really symmetrical and sounds a lot worse. You cannot connect a subwoofer from a symmetrical amplifier to the loudspeaker terminals of that woofer. The subwoofer must therefore be controlled from the RCA or XLR outputs of the preamplifier. So there is around 900 watts available per side for the review-line array. Do you need that power? Yes, because then the amplifiers almost always operate in a low distortion area. Also yes for when you really lash out. Then the dynamic range is available and extremely distortion-free. More powerful amplifiers also offer a lot of peace and authority. Modern high power amplifiers also play just as detailed and subtle as a 300b amplifier and often more detailed. Then also a no, because many line arrays also play at a normal listening volume with four times 100 Watt and because you will not listen for a long time at sound pressure levels above 120dB. Also a no because you have an enormous acoustic power due to the radiation coupling and the large cone surface. If the array has a reasonable efficiency, you can already get a lot of sound with four times 50 watts. Distortion-free playback is also dangerous. You therefore do not have the idea that the sound is very loud. But, the SPL meter has never been more excited here. A tip with such systems is to keep visitors without qualifications away from the volume control. This can make relocation of eardrums unnecessary.

LISTENING

After placing the amplifiers in such a beautiful rack, measuring, choosing suitable cables and a preamplifier that does exactly what is desired, it is time to listen. The experience with a real line array is completely different from listening with the well-known floor standers that everyone knows. The whole system works on balanced power. Normally you always hear some noise and/or hum with the ear against the speaker. In this case it is really dead silent. Like the system is off. Balanced power can lower the noise floor by 10 to 30dB. That has a considerable influence on the dynamics, the layer and the spatial reproduction. What immediately stands out is the integration of the sound. That is a few lines better than with the various amplifiers that this system usually runs with. Logical if you use four of the same amplifiers. All Van Medevoort amplifiers are built identically. So equal specs with regard to phase and sound. Only the delivered powers differ. The amplifiers are therefore suitable for bi-amping. The line array could therefore also have played with two vM PA471 (low) and a vM PA472 dual mono for the mid/high. The second striking observation concerns the degree of 'flow'.

On the line arrays, these amplifiers come out in a very musical way. Van Medevoort indicates that these amplifiers are 'musical'. You can't say that linguistically. Only music can be musical and so can a person, but an audio system cannot. However, everyone will understand the essence of this statement. Music has something of a natural flow. A kind of ease with flexibility, rhythm, timing, it breathes and is loose. At least, if you are just past lesson three on the violin or piano. There is also an enormous calmness in the system. That list of properties indicates exactly what the four vM PA471s do on the line arrays. Let it be clear that the playback has an unprecedented speed, presents a fabulous stage, creates impressive dynamics, transmits an exceptionally beautiful sound from the recording, provides a deep detailed insight and a superior bass reproduction. Voices sound really sublime. But, the playback doesn't sound technical, over-controlled or over-the-edge. It has something natural about it, as you experience it while listening to live music, for example. This may not be the case with all larger loudspeakers, but these line arrays also present the voices and instruments in the correct dimensions. A guitar is therefore not as big as a barrel organ. It is also striking that the high does not sound 'soft'. Phono cartridges, amplifiers and some loudspeakers often go wrong by presenting a too sweet, soft and rounded high. Try playing a chimes or metallophone at home. You probably remember them from music lessons at school and they are instruments with metal rods. Such an instrument sounds anything but soft or rounded, but also not harsh, mean or distorting. Such instruments can be a reference for how high should sound in a good system. To get these line arrays to sound really perfect, we also played with different sources. This is again a bit of fine-tuning. Replacing a DAC with a dCS Rossini APEX, of course, also made a substantial difference. Does such a large loudspeaker system then present a haze of unbalanced sounding low? No, well-tuned large loudspeakers only reproduce the bass that is present in the recording and also at the correct level in relation to the mid and high. Better low is generally less low. But, if serious layer content is present in the recording, you will also receive that mercilessly. The vM amplifiers can then pull out effortlessly. This is probably also where the added value of larger loudspeakers and line arrays lies. The presentation of the music is more live-like with a more realistic stage depiction of the size, weight and impact of such an event. Such a system makes greater demands on your emotional experience and involvement. But, as noted earlier, the purchase of larger loudspeakers and line arrays is a bridge too far for most music lovers. But, if there is a chance, it is recommended to give it a listen.

BACK TO VAN MEDEVOORT

The challenge was to investigate whether the modest-looking van Medevoort vM PA471 monoblocks could drive difficult loudspeakers, including line arrays and also large electrostats. Van Medevoort claims that these beasts, with their oversized power supplies and high damping factor, can do that effortlessly. Well, the match results in 4-0 for Ad. Not only do these monoblocks drive the line arrays whistling, but also with a very high sound quality. It also goes perfectly with large electrostats. You really can't put a class-d on that. But, let's descend from the Ferrari, the AP and those line arrays to the world of the average music lover. Then you have an excellent amplifier in the form of the vM PA471 or the vM PA472 (dual mono) for the larger, more difficult to control and also for the 'normal' speakers. It is always thought that amplifiers that are much more expensive than, for example, these Van Medevoorts, are immediately much better. That may be true once in a while. Also, some very expensive amplifiers are only slightly better on partial aspects. But, reasonably, you have to look for a very long time to significantly improve the performance of these vM amplifiers. You build the best audio systems with knowledge and understanding. Don't throw a lot of money around. The Van Medevoort amplifiers are the viable alternative in a world with often too high and unrealistic prices.

Ruud Jonker, FWD - December 2022

VAN MEDEVOORT AUDIO

https://www.vanmedevoortaudio.nl
https://www.vanmedevoort.com

Photography: Van Medevoort, Lyngdorf, Steinway-Lyngdorf, Bob Carver, Infinity, Ruud Jonker

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