Planar Array VS *Plane Array*

EDC Acoustics ***Plane Array***(TM) technology is uniquely different to planar array technology, and should not be confused.

A planar array is a flat radiator - a flat acoustic generator. In most instances a planar array is constructed using many acoustic sources which act in unison as a single, flat, radiating planar surface. Most premium line array manufacturers use a Planar (or essentially Planar) waveguide attached to high frequency drivers in order to create a cylindrical (or 1-Dimensional linear) wavefront by using multiple drivers with a flat (or narrow) dispersion. A planar array may also use spherical or half-spherical radiating transducers and create a flat propagating wavefront by creating a combined radiating surface that is sufficiently longer than the wavelength being produced.

A ***Plane Array*** takes a completely different approach, using inherently spherical or half-spherical propagating transducers to create an inherently spherical or half-spherical wavefront. The purpose of a ***Plane Array*** is to generate an acoustic front that is of high magnitude (high SPL) and of high coherence, with both wide and narrow dispersions.

There are 4 main differences between a Planar Array and a ***Plane Array***

1) Planar Arrays feature high directivity (narrow beam) acoustical properties. A ***Plane Array*** features acoustic wavefronts with both wide and narrow acoustical properties.

2) Planar Arrays can be manipulated to create broader beam dispersions through the use of amplitude shading, FIR filters or low pass filtering - however such manipulations defeat the definition of a planar array. With such manipulations the acoustic wavefront is no longer operating of sufficient length relative to the wavelength, and for some frequencies potentially only a single driver in the array is operating. Under such conditions the planar array is forced to act with nonplanar characteristics. As a result, power summation is severely limited. By comparison, a ***Plane Array*** features proprietary and patented algorithms that allow for full bandwidth manipulation of the acoustic wavefront for every acoustic source, with full bandwidth power available all the time. Such a unique algorithm is capable of producing coherent summation over all useful audio frequencies, creating coherent summation even at high frequencies. As such, a ***Plane Array*** is capable of achieving concert level SPL across the entire audio bandwidth, regardless of narrow or wide beam dispersions. A ***Plane Array*** does not use low pass filtering, does not use amplitude shading and does not use FIR filters to create broader or narrower beams of sound.

3) A Planar array is only capable of full bandwidth constructive summation for a narrow beam. A ***Plane Array*** is capable of full bandwidth constructive summation for all beam angles in both the near and far field.

4) A Planar array lacks 3-Dimensional control, with control limited to linear pan/tilt controls or simple beam dispersion (limited to act as a conventional acoustic source for wide dispersions or as a planar array for narrow dispersions). A ***Plane Array*** has the unique ability to apply patented algorithms that allow for complex 3-Dimensional acoustic wavefront control, with complex nonsymmetrical shapes, shadings, slopes and skews available.

Current Steered Solutions (Column Beam Steering, Steered Line Arrays) VS *Plane Array*

EDC Acoustics ***Plane Array***(TM) technology is uniquely different to current beam steered technology. Current beam steering technology on the market typically features single dimension control only - usually with horizontal control limited to the mechanical design of the speaker itself. Current beam steering technology acts as a planar array creating a naturally narrow dispersion, and utilises FIR filters, amplitude shading and/or low pass filtering to broaden the beam angle in a single dimension. This results in a product that is naturally convergent (narrow dispersion) and manipulated to produce wider dispersions. Linear algorithms also can be applied to create simple pan and tilt of the beam. As the beam steered product is broadened, its peak SPL ability is reduced. In most instances there is potentially only a small proportion of speaker drivers (perhaps even 1) operating at high frequencies and at full power for a broad beam dispersion. Some existing steered technologies utilise a conventional compression driver and horn arrangement to regain high frequency acoustic energy, but in doing so eliminates the beam steering ability of high frequencies. FIR filter control additionally creates phase response differences between acoustic sources which reduces acoustic qualities and also reduces maximum amplitude summation for high frequencies. Once a system is equalised for typical use, the result is a limitation on SPL. As such, current beam steered technology is typically limited to speech/background/foreground music applications.

EDC Acoustics ***Plane Array***(TM) technology uses special patented algorithms to create both narrow and broad acoustic dispersions. These patented algorithms do not use FIR filters, do not use amplitude shading and do not use low pass filtering to broaden acoustic spread. Furthermore, our algorithms apply a phase constant output between all output devices. The result is highly coherent sound, with all transducers providing full bandwidth power capabilities all the time. Every driver is working to its maximum capabilities and across its entire operating bandwidth all the time - regardless of a narrow or broad configuration. Furthermore, the patented algorithms are not limited to a simple single dimension vertical dispersion, or even a simple horizontal and vertical dispersion. Complex 3-D acoustic wavefronts can be created using special algorithms that can curve, skew, slope and tilt the wavefront to create almost limitless acoustic shapes. As such, EDC Acoustics ***Plane Array***(TM) technology is not limited to speech and background music applications, but is also supportive of concert level SPL - whilst providing the coherence and transient response comparable to a studio monitor.

Conventional Speakers VS *Plane Array*

EDC Acoustics ***Plane Array***(TM) technology provides a unique scalability. With a conventional speaker, each speaker is designed with specific horizontal and vertical pattern control. When additional SPL is required it is typical that a second speaker is used 'side-by-side' to provide additional power. The operator is required to direct each speaker towards a different part of the room to negate comb filtering affects. This results in low frequency summation (SPL increase) but negligible high frequency summation. The system becomes louder in the lower frequencies, but not the high frequencies. An operator can overlap high frequency horns, but this creates complex interference and comb filtering, providing both constructive and destructive interference in the near field - impacting both SPL and sound quality. With EDC Acoustics ***Plane Array***(TM) technology the operator can add additional speakers, and each cluster acts as a single speaker. This provides a broadband SPL increase across the entire audio bandwidth (including the HF), whilst avoiding complex interference - retaining acoustic quality whilst providing more SPL. An EDC Acoustics ***Plane Array***(TM) also provides the added benefit of being capable of producing adaptable 3-Dimensional acoustics wavefronts not possible with a conventional speaker system, and can do so using one single inventory item. A conventional speaker can only produce what it is mechanically designed and manufactured to produce.

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Line Arrays VS *Plane Array*

Line array systems have a difficult and conflicting task to perform. They are required to act in a planar array (a plane in a single dimension is a line, so in the vertical dispersion a line array is a 1dimensional planar array) function to create broadband SPL summation for longer throw distances, and are also required to splay to reduce SPL and increase coverage for shorter throw distances. Line array designers are faced with a compromise - to design a speaker with a flat front (1Dimensional planar) for longer throws, or conventional dispersive for shorter throws. The result is typically a tight vertical dispersion design, usually limited to 10 degrees or less. This means the acoustic wavefront is compromised by design. For short throw applications the segmentation of the line array splay results in less comb filtering for shorter throw (and therefore less HF summation for short throws). For long throw applications the 10 degree HF dispersion overlap to create comb filtering. Thankfully as these speakers are throwing further, the more the audience is in the far field where the HF overlap distances become more negligible.

As a result, line arrays exhibit significant comb filtering effects throughout the HF region. More importantly, a line array frequency response is less linear, as 1-Dimensional planar array properties exist. This results in a stronger low-medium frequency beam of energy through the centre axis of the line array, whilst high frequency energy summation is restricted to the 1-Dimensional planar configuration of the array. This low-medium frequency energy beam can be corrected with signal processing, but in doing so must significantly reduce the maximum SPL of the line array, as either FIR filters, low pass filters or amplitude shading must be applied to broaden the narrowing beam of energy in the low-mid frequency region.

By comparison, an EDC Acoustics ***Plane Array***(TM) is not restricted by design to act in either a planar array manner or conventional speaker manner. Each and every driver can work together to create an acoustic wavefront that is consistent in dispersion characteristics, regardless of frequency (low frequency limit array size dependant). This overcomes the line array issue of a strong lowmedium frequency beam down the centre axis of the array. The complex 3-Dimensional wavefront of an EDC Acoustics ***Plane Array***(TM)also means the HF is not limited to the effects of less HF summation over larger splay coverage. A wavefront can be generated that creates more spread whilst increasing the SPL for the wider coverage area. This property can be used to throw more energy to the sides of the front of the room - to compensate for distance losses when compared to the centre of the front of the room. Once again, this consistency can be achieved without compromising SPL capacity. Finally, the high coherence of the ***Plane Array*** system provides for a much higher quality sound, with significantly less comb filtering as compared with a conventional line array. Naturally, an EDC Acoustics ***Plane Array***(TM) also provides the added benefit of being capable of producing adaptable 3-Dimensional acoustics wavefronts not possible with a line array system, and can do so using one single inventory item.

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