



Sales of Professional Sound,
Light and Video Equipment

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VIDEOPOLIS

SOUND SYSTEM

date july '92

SET UP

Videopolis, thus the sound system, is designed for a wide range of applications. To support this, different loudspeaker systems have been incorporated. Basically the following, more or less independent, loudspeaker systems can be recognized;

- Main Cluster (L, C, R)
- Subwoofers
- Dance floor clusters
- Restaurant speakers
- Surround system

From an signal routing point of view, all configurations can be divided in two major groups; Stage oriented shows & performances and Disco activities.

Suggested signal assignment for those situations is;

- Stage Performance

<u>Speaker system</u>	<u>Signal assignment</u>
<i>Left & Right cluster + part of subs</i>	<i>Stereo sources</i>
<i>Center cluster</i>	<i>Lead vocals, soloist</i>
<i>Subwoofers</i>	<i>LF effects, pronounced LF on specific sources</i>
<i>Dance floor clusters</i>	<i>None</i>
<i>Restaurant speakers</i>	<i>Sum of L & R & C</i>
<i>Surround speakers</i>	<i>Surround/effects signal</i>

- Disco

<u>Speaker system</u>	<u>Signal assignment</u>
<i>Left & Right cluster + part of subs</i>	<i>Stereo sources</i>
<i>Center cluster</i>	<i>None or sum of L & R</i>
<i>Subwoofers</i>	<i>Enhancement of LF sound.</i>
<i>Dance floor clusters</i>	<i>Stereo source</i>
<i>Restaurant speakers</i>	<i>Sum of L & R</i>
<i>Surround speakers</i>	<i>None or sum of L & R</i>

The major difference between the two routings is the use of the dance floor clusters. As these can be controlled by the group output fader, no changes in signal routing are necessary when switching from one setup to another.

SPECIFIC STAGE ACCOMPANY EQUIPMENT

Stage Accompany Performer System

The Performer system is designed for maximum output at minimum dimensions, while maintaining maximum sound quality.

The Performer system is based on the Stage Accompany Compact Driver for maximum sound quality (See product info). By applying a forced cooling, the Compact Driver is capable of an output comparable to a 2" compression driver but without the distortion and with a significantly extended frequency range.

To optimize the systems impuls response and minimize the dimensions, the Compact Drivers is combined with a direct radiating low/mid.

Minimum dimensions result in effective aligned arrayability, thus higher output when multiple cabinets are combined.

For maximum consistence of the sound at different levels, no sliding X-overs or bandlimiting filters are applied.

PPA1200

The major difference of the PPA1200 to a traditional power amplifier is that a microprocessor controls all the settings and internal protections. The audio signal path however is fully analog.

The micro-processor handles;

Internal protection of the amplifier.

All control settings like levels, ground lifts, bridge mode, power amp on, switch on delay etc.

Output power limit (AEC)

Selection of X-over (fixed frequency) and loudspeaker presets.

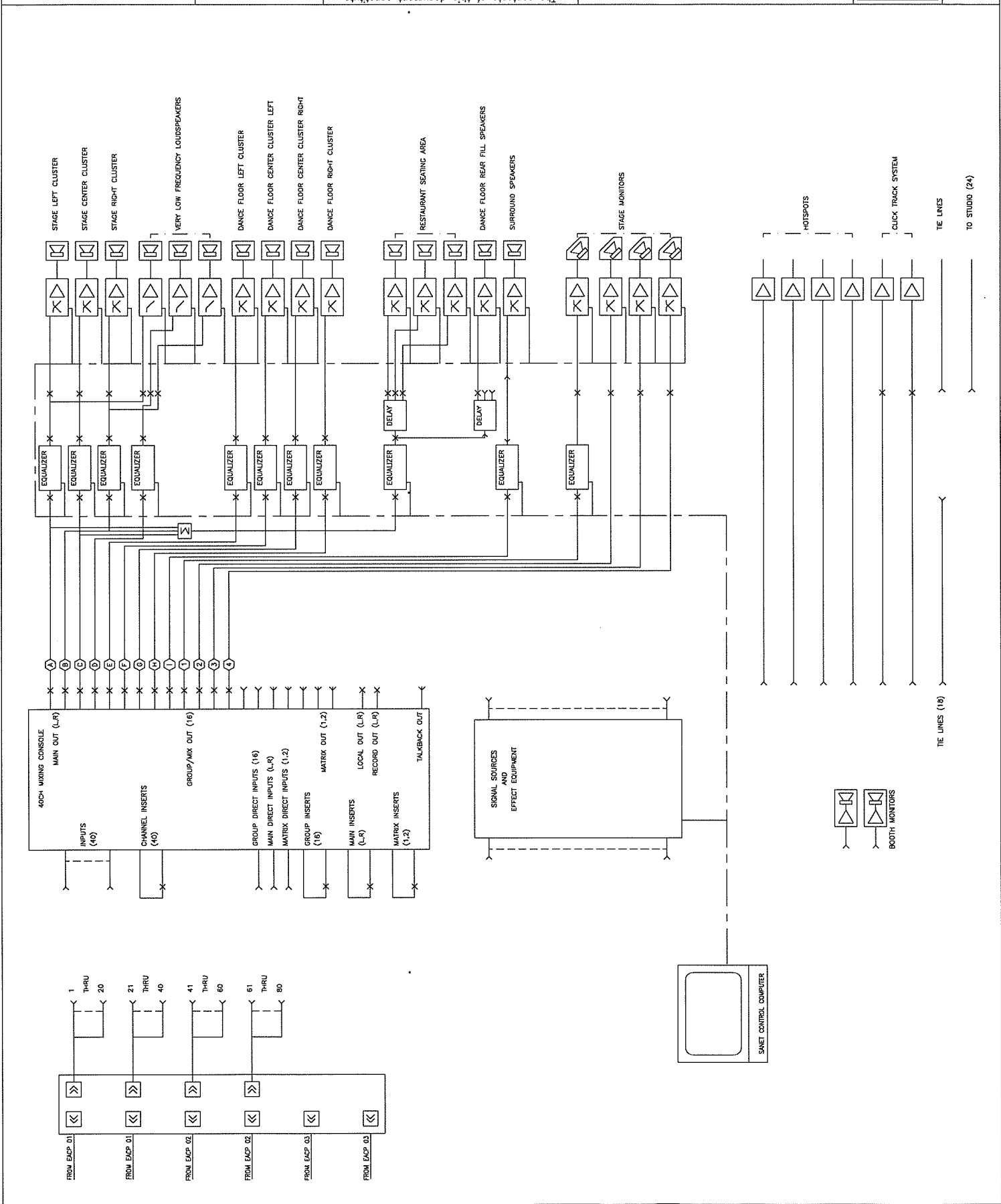
SAnet control

A special feature of the PPA1200 is that the feedback is taken from the speaker terminals, thus compensating for cable influence on the damping factor.

PPE2410

The PPE2410 is a 2-channel, 4 band parametric, micro-processor controlled, Parametric Equalizer. As the micro-processor handles all filter settings, a maximum reproducibility is achieved. The user programmable presets (64) enable the creation of instantaneous recallable dedicated settings for different applications.

Unlike a graphic equalizer, a parametric equalizer has filters with variable center frequency and bandwidth. Therefore a single filter can be tuned exactly to the required correction where with a graphic equalizer multiple filters would be needed. This reduces significantly the required number of filters in the signal path and therefore improves the overall sound quality.



Loudspeaker Stacking

If one wants to obtain maximum sound quality in sound reinforcement, one of the things to look for is coverage. Obviously, an even, smooth coverage is what's desired. In addition today's output requirements and venue sizes make it impossible to use only a single loudspeaker.

Problem

Using multiple loudspeakers for reproduction of the same signal puts very strict demands on how they are arranged, since the configuration will influence both directivity and sound quality of the loudspeakers. Both effects are due to the fact that, for any particular listening position, the distance to the different sources varies, resulting in interference problems, or so-called comb-filtering.

Solutions

There are two ways to tackle the problem.

One way is based on the consideration that if you have multiple interferences, and randomize their mutual relations, the envelope of the overall energy response will be flat. This effect can be obtained by stacking the loudspeakers in a particular way or by applying specific gain, polarity, phase and delay settings to each individual loudspeaker. A special example of this way

of minimizing the influence on energy response and directivity is the so-called Bessel configuration. In this article we will refer to this type of array as a 'Randomised array'.

The other way is to minimise the distances between the sources in order to simulate a single source and to align the signal for all frequencies. As wavelengths of high frequencies become very small, it should be clear that the main problem will be at higher frequencies. In this article we will refer to this type of array as an 'Aligned array'.

Pros and cons

Both systems have their specific advantages and disadvantages.

Randomised array:

Advantages

- Basically valid for all systems.
- Virtually unlimited in array size.

Disadvantages

- Requires a minimum number of cabinets. A certain number of cabinets is required to obtain the randomised effect, so in small configurations the effect will be doubtful.
- Not a neutral sound reproduction. Although the envelope is flat, the comb-filtering will cause coloration. It is difficult to compensate for

this coloration as it is not related to the overall energy envelope.

- Way of stacking will depend on the array size.

Aligned array

Advantages

- Minimum coloration due to absence of comb-filtering.
- Less cabinets required
- Due to the close stacking, acoustical coupling is effective up to relatively high frequencies, thus less cabinets are needed.
- Stacking considerations are always the same. Easy to understand.

Disadvantages

- Cabinet has to be designed to be used this way. In the design stage, the physical size of the cabinet has to be determined so as to allow for close coupling of the high frequency units.
- Only valid up to a certain array size. With a large number of cabinets, the overall physical size of the stack can become too large for a proper aligned operation.

A real live stack will always have a cross-over point between being a randomised or an aligned array. At (very) low frequencies the distance between the cabinets, compared to the wavelength will always be

EUREKA EVENT OF EXCELLENCE

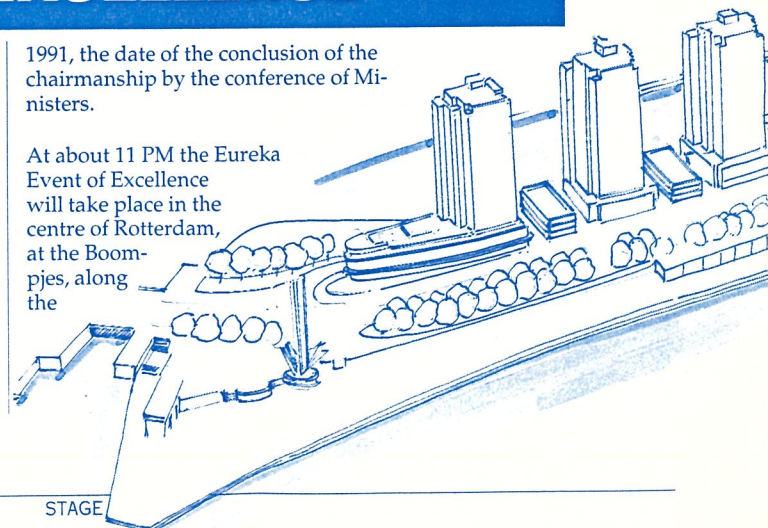
From July 1990 until July 1991 the Netherlands is chairman of Eureka.

Eureka is an international technological joint venture programme in which some 2000 companies and institutions participate. It represents more than 500 projects, to a total value of 7,000 million guilders. The primary target of Eureka is to stimulate international cooperation in the technological field and specifically research and development.

The Dutch chairmanship coincides with the fifth anniversary of Eureka. This occasion will be celebrated in an appropriate manner on June 18,

1991, the date of the conclusion of the chairmanship by the conference of Ministers.

At about 11 PM the Eureka Event of Excellence will take place in the centre of Rotterdam, at the Boompjes, along the



The Professionals For Professionals!

the wavelength will always be small, resulting in an aligned array. At (very) high frequencies, however, it will be impossible to put the different drivers close enough together to get an aligned array. In designing an array one has to make a choice as to where to put this cross-over point: as low as possible (randomised array) or as high as possible (aligned array).

Stage Accompany Performers

As Stage Accompany Performers use the Compact Driver for the Mid/high frequencies it was one of the major design goals to maintain the superior impulse response in larger arrays. As randomised arrays, by definition, cause a time smeared response, the first option considered was an aligned array. The restriction of a limited array size was not considered a problem as arena and stadium concerts are only a limited piece of the market and randomised arraying would be possible anyway.

It was found that with a cabinet front of minimum width (380 mm) and an enclosed angle of 22.5 degrees, comb-filtering was not present within the audio band and within the horizontal coverage (70

degrees) of the loudspeaker. Basic coverage angle does not change with up to three cabinets next to each other. Outside the nominal coverage angle, however, the overspill energy was reduced, resulting in a more than proportional increase of output within the coverage angle.

It will be clear that for an optimal result in an aligned stack, the cabinets must be stacked very accurately. To ensure this, the Performer bass cabinets (flight-case version) have notches on top which match the feet of the mid/high cabinet. This also avoids the moving of the cabinets due to high output levels.

Flying

As discussed before, the maximum stack size for an aligned array is limited. A stack larger than four times a Performer 2-26 is not desirable anyway, as the Sound Pressure Level close to the stack would then be too high for any application, even for the most ultimate hardrock fanatic. The solution for a more even sound distribution and for larger configurations is the use of flying clusters. The advantage of flying is that the ratio (and thus level difference) between the minimum and

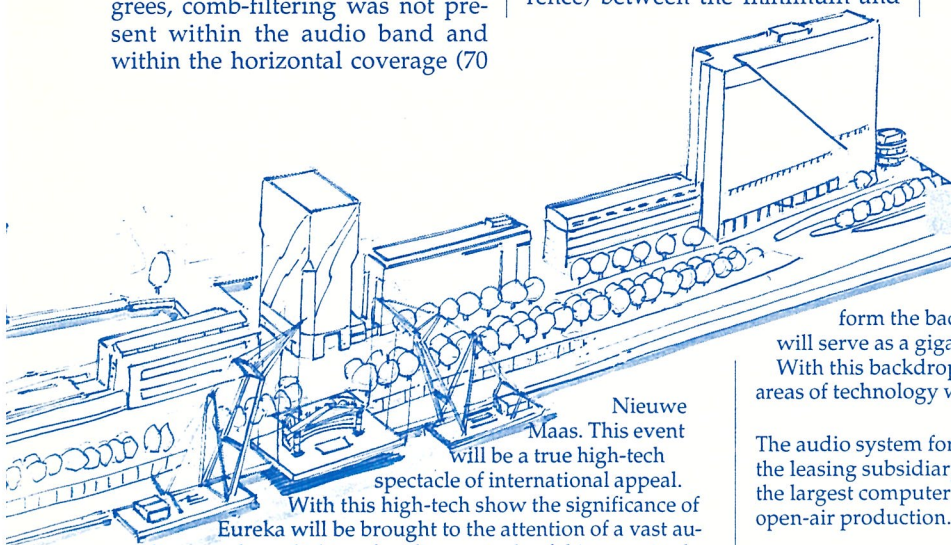
maximum distance is reduced. By properly mapping the loudspeaker directivity, position and aiming in relation to the room geometry, a very even sound distribution can be achieved.

The main difference with stacking is that vertical coverage becomes one of the key parameters for a good result. As room geometries and sound distribution requirements vary with the application it is difficult to give a general rule for configuring a cluster. Normally a cluster will use several rows, each configured as an aligned array. The tilting of the different rows, combined with the vertical coverage of the loudspeakers, should achieve the total vertical coverage that is desired.

Conclusion

When these factors are taken into account from the beginning of the design phase, it is possible to design a loudspeaker which is suited for stand alone use as well for aligned arrays. With such speakers, very compact clusters and arrays with high quality, high level output, can be achieved.

Artist impression of the décor to be realised on June 18.



Nieuwe

Maas. This event

will be a true high-tech spectacle of international appeal.

With this high-tech show the significance of

Eureka will be brought to the attention of a vast audience. A laser, light and audio spectacle of this magnitude has never been organized before in the Netherlands.

The event is held at the Nieuwe Maas between Leuvehoofd and the railway bridge. The buildings along the Boompjes will

form the backdrop and the water of the Nieuwe Maas will serve as a gigantic stage.

With this backdrop and stage Eureka and the nine Eureka areas of technology will be visualized.

The audio system for the event will be supplied by Stage Rent, the leasing subsidiary of Stage Accompany BV in Hoorn. It is the largest computer controlled audio system ever used in an open-air production.

THE AUDIO SYSTEM

Ever since the introduction of the Performer System in March 1990, now more than a year ago, many positive reactions to the system have been received. However, the best compliment un-

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