



## **SOUND SOLUTIONS FOR ACOUSTICALLY CHALLENGING ROOMS**

High speech intelligibility.  
Perfect music reproduction in reverberating  
and challenging environments.



## SOUND SOLUTIONS FOR ACOUSTICALLY CHALLENGING ROOMS



### THE STARTING POINT

When we consider reverberating rooms, such as traditional church rooms, from an acoustic perspective in terms of the transmission of speech and modern music, this can pose a great challenge, depending on the room.

Traditional or even newly-designed rooms for church services often exhibit an acoustic life of their own, depending upon the acoustic frequency. These rooms are primarily optimized for organ music or for speech from certain places (pulpit or chancel).

The use of the church rooms is changing and must be adapted accordingly. Both speech and music signals need to be transmitted with a high level of syllable intelligibility and quality. There needs to be a directional reference to what is happening. New presentation media need to be used.

Sound solutions based on traditional, decentralized 100 Volt technology very quickly reach their physical limits under these new requirements.

100 Volt technology is a transmission solution that was developed for voice announcements and is not recommended for high-quality audio transmissions.

Add to this the fact that a reverberating room like a church creates additional challenges for a sound system. Speech and music signals need to be received at a pleasant sound level and in perfect quality by the listeners.

This requires speakers with high clustering characteristics, which can direct the sound beam and are therefore ideally suited for applications in reverberating rooms. By focussing the sound beam, it is possible to evenly distribute the sound only to the audience area and to only slightly excite the rest of the room acoustically.

More direct sound means higher speech intelligibility and signal quality.





## A SOLUTION

Developed and manufactured by Pan Acoustics in Germany, the column speakers with Beam Steering technology offer perfect interaction of timeless speaker design and outstanding speech and music transmission.

Beam Steering technology allows the signals to be perfectly focussed on the audience areas and transmitted at a constant volume to the target area for the sound.

It is possible to play back CD and live sound signals in high quality. Even the hook-up of modern microphone systems can be realized without major effort.

The column speakers from Pan Acoustics are known for a high level of feedback protection as well as constant sound quality and sound levels even over long distances. The speaker arrays can be discreetly integrated into the existing room architecture, thanks to color customization of the housing.

## LESS IS MORE

Through the use of active DSP column speakers from the Pan Beam series, significantly fewer speakers are required than in traditional 100 Volt installations.

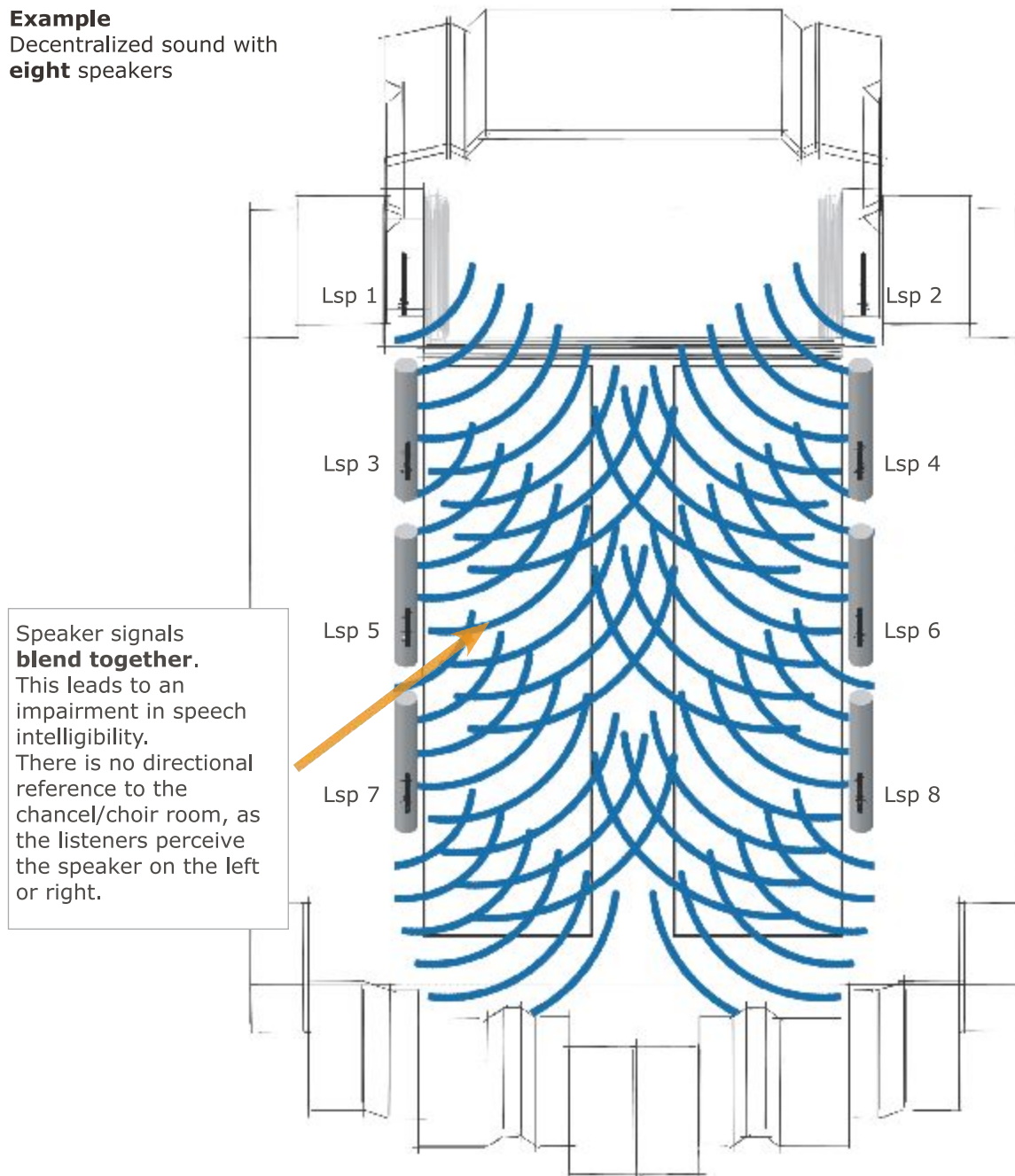
The superb focusability and the option of correcting the frequency response and delay in the speaker itself enable an interesting effect: directional reference.

This means that the person speaking, e.g. in the chancel, is perceived acoustically and visually from this part of the room. There is no confusion between what people see and hear.

A nave with a depth of 25 m and a width of 15 m, for example, can be optimally equipped with two Pan Beam PB 16 speakers for speech and music. This provides visual and acoustic directional reference to the chancel and enables the listener to more attentively follow what is going on.

## SOUND DISTRIBUTION AND DIRECTIONAL REFERENCE

**Example**  
Decentralized sound with **eight** speakers

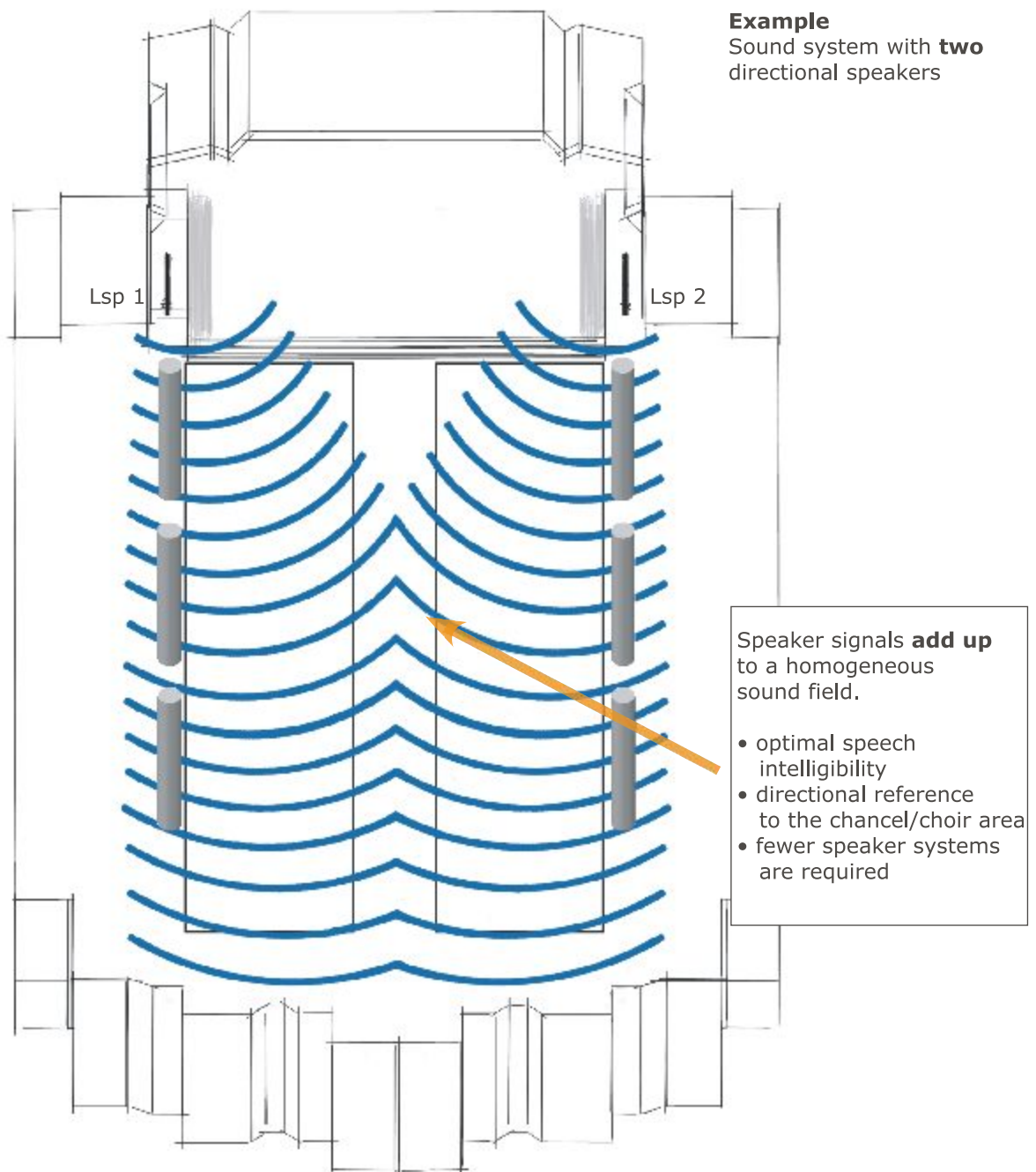


### DECENTRALIZED SOUND (e.g. 100 Volt)

Legacy sound systems or newly planned public address systems in churches are often implemented using the previously-mentioned traditional 100 Volt technology. This involves the installation of many individual speakers. As a function of the system, each speaker receives the same signal at the same time. This results in a diffuse sound image, which massively impairs speech intelligibility and severely limits music reproduction. The ear is directed towards the nearest speaker and no longer perceives the person who is speaking.

#### The disadvantages:

- very many speakers along a complex wiring system
- no directional reference to the chancel or to the persons speaking
- poor speech intelligibility, as a large number of speakers receive the same signal at the same time
- Limited options for music reproduction



## SOUND WITH DIRECTIONAL SPEAKERS

Sound systems with intelligent speakers, which can delay the audio signal and adjust its sound, achieve very high speech intelligibility and music reproduction even in acoustically challenging rooms. There is directional reference to the scene of action (e.g. chancel) is given.

With these speaker installations, e.g. with Pan Beam speakers, fewer speakers are required than with 100 volt systems.

### The advantages:

- significantly fewer speakers
- directional reference
- high speech intelligibility
- music playback is possible even in acoustically challenging rooms



## RETROFITTING OF EXISTING SYSTEMS POSSIBLE



### RETROFITTING OF EXISTING SYSTEMS

Communities are often faced with the challenge of modernizing or completely renewing the existing sound systems in churches.

DSP-based column speakers require audio signals, control data (e.g. for switching between saved presets) and a power supply to operate. These requirements lead to the need for new wiring installation, which can often result in additional high costs.

Pan Acoustics has addressed this issue and developed a system that enables the use of existing wiring, e.g. from a 100 Volt sound system or speaker wiring, for operating active speakers from the Pan Beam series.

The Pan 2-Line technology can use the existing 2-wire system (100 Volt or speaker wiring) for the transmission of the audio signal, the control data and power supply.

This eliminates the need to lay new wires, not to mention the mortise and paintwork associated with these tasks.

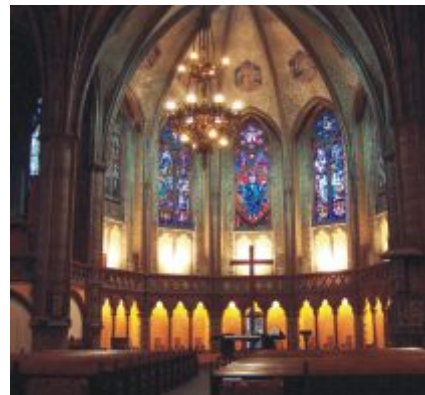
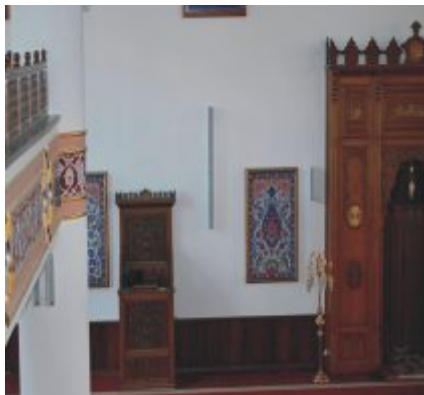
Thus, historically-preserved façades and walls can remain largely untouched and do not have to be opened up and painstakingly restored to their original condition.

A conversion or modernization of a sound system can be completed within just a few days.

### **NEW SOUND FROM OLD WIRES**

Pan 2-Line makes it happen.

- **Milan Cathedral**  
Milan, Italy
- **St. Peter**  
Zülpich, Germany
- **St Stephen's Basilica**  
Budapest, Hungary
- **DITIB Merkez Mosque**  
Duisburg, Germany
- **Frauenkirche**  
Munich, Germany
- **St. Clement's Basilica**  
Hanover, Germany
- **Ss. Corpus Christi**  
Berlin, Germany
- **Como Cathedral**  
Como, Italy
- **Mosque of Touba**  
Touba, Senegal
- **Christ Church**  
Oxford, England
- **Bern Cathedral**  
Bern, Switzerland
- **The Holy Trinity Church**  
Kempele, Finland
- **Boa Nova Chapel**  
Lisbon, Portugal
- **Market Church**  
Essen, Germany
- **Cathedral of Leicester**  
Leicester, England
- **St. Servatius**  
Siegburg, Germany
- **St. Victor**  
Schwerte, Germany
- **Porvoo Cathedral**  
Porvoo, Finland
- **Mother Teresa**  
Bolzano, Italy
- **New Apostolic Church**  
Hanover, Germany
- **Oulu Cathedral**  
Oulu, Finland
- **Perpignan Cathedral**  
Perpignan, France
- **St. Michael's Cathedral**  
Veszprem, Hungary
- **Cathedral of Fort-de-France**  
Martinique, Caribbean
- **Saint Mary's Church**  
Assago, Italy
- **Alrajhi Mosque**  
Mecca, Saudi Arabia





## ACTIVE DSP COLUMN SPEAKER

### Shapely. Versatile. Functional.

Cascading capability. Multibeam. Uniform sound distribution. Side lobe optimization. Applications: live and fixed installations.



## TECHNOLOGY

Audio, control data and power supply over only two wires, e.g. I-Y(ST)Y or existing 100V wiring. Pan 2-Line is an option for products from the Pan Beam series.



## PASSIVE COLUMN SPEAKER

### Shapely. Versatile. Functional.

Solid. Different performance levels. Applications: Live and fixed installations.

### PAN ACOUSTICS COMBINES EXPERTISE AND KNOW-HOW

We create products with a unique sound performance.

We create solutions for acoustic challenges.

We also make **weatherproof** (IP 54/ IP 65), **seawater proof** and **temperature resistant** (-30°C – 80°C) products.

All products are designed, developed and manufactured in Germany with high-quality materials and according to strict criteria by Pan Acoustics.

### QUALITY - MADE IN GERMANY

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