

Roland

Systems Group

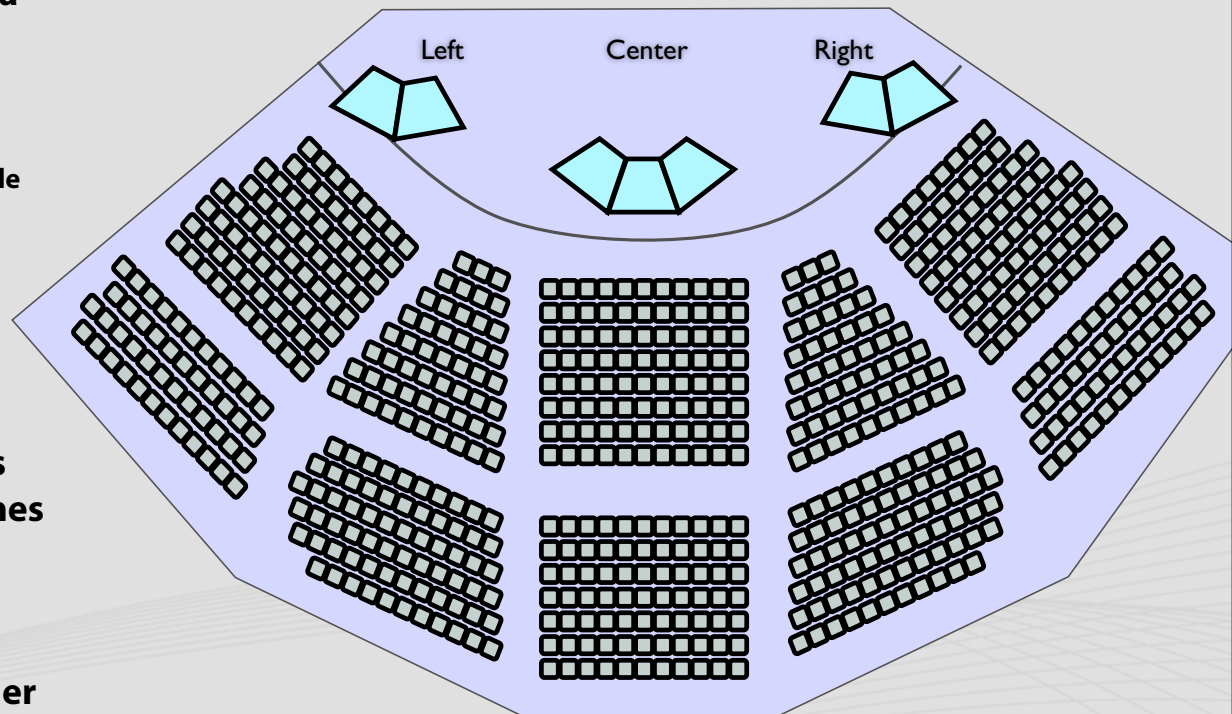
**Roland V-Mixer in a
“Cross Matrix LCR” System**

WHY: Many large Concert Halls and Churches are “Fan” Shaped, very wide. Sound coverage can be difficult. Mono is a common solution. Cross Matrix LCR is a solution that can provide good stereo imaging for most seats.

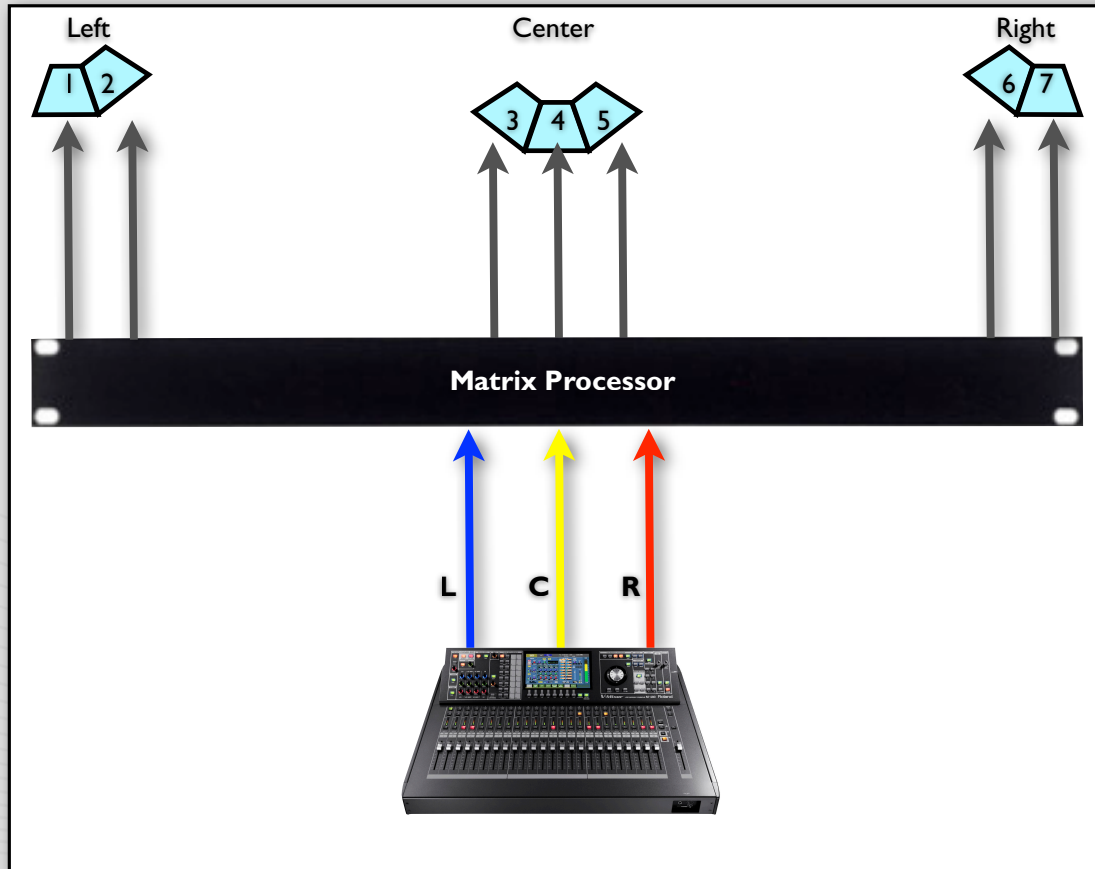
(Standard LCR with Convergence is usually only suitable to venues which are deeper than they are wide. For a wider venue, a Cross Matrix LCR is usually better.)

Cross Matrix LCR

- **Matrix Processor Converges and Assigns LCR Signals to multiple speakers in 7 zones (not just 3 of standard L, C, R)**
- **Cross Matrix LCR is suitable for wider venue or “Fan” shaped venue.**
- **For Novice users Cross Matrix LCR is easier to use than manual Convergence of a standard LCR system.**

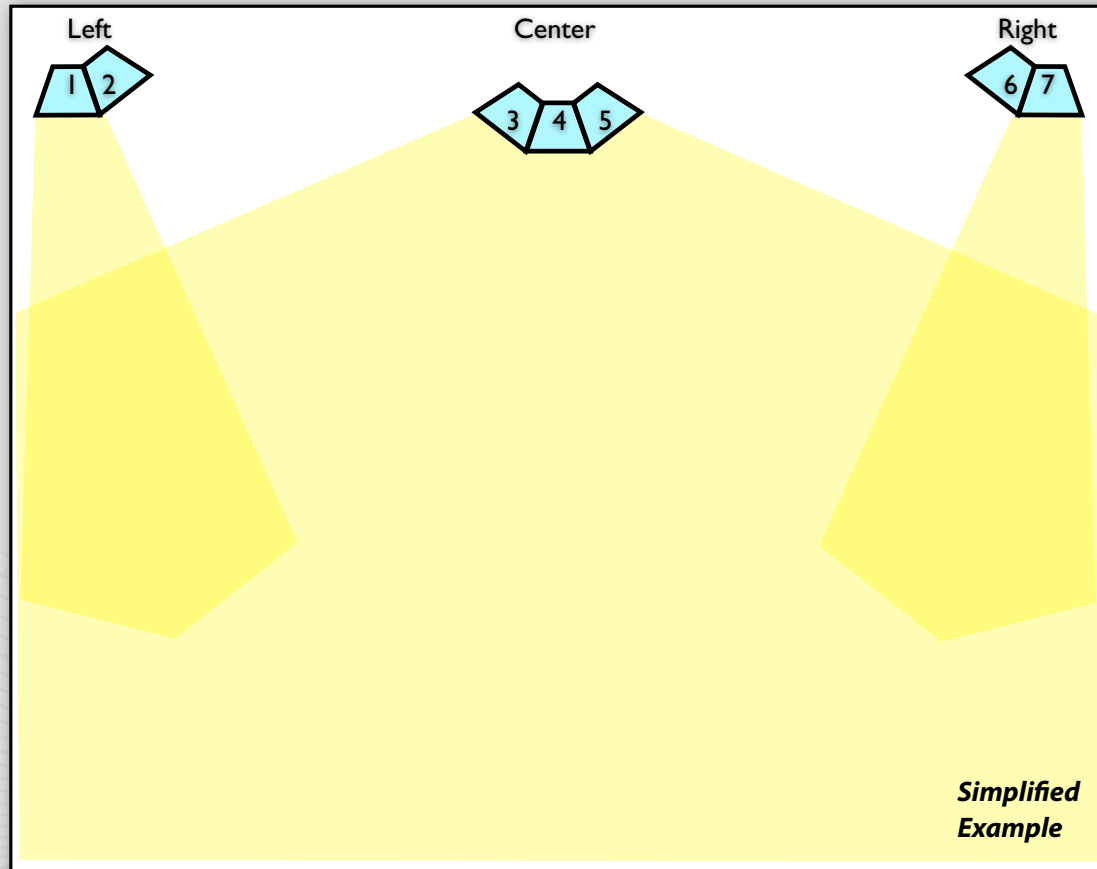


Cross Matrix LCR



- V-Mixing System Sends LCR Signals to Matrix Processor
- Matrix Processor Converges and Assigns Signals to multiple speakers in 7 zones (not just 3 of normal L, C, R)
- V-Mixer Settings:
 - Bus Select Always Mutually Exclusive
 - No Convergence
 - No Panning

Cross Matrix LCR - Simplified

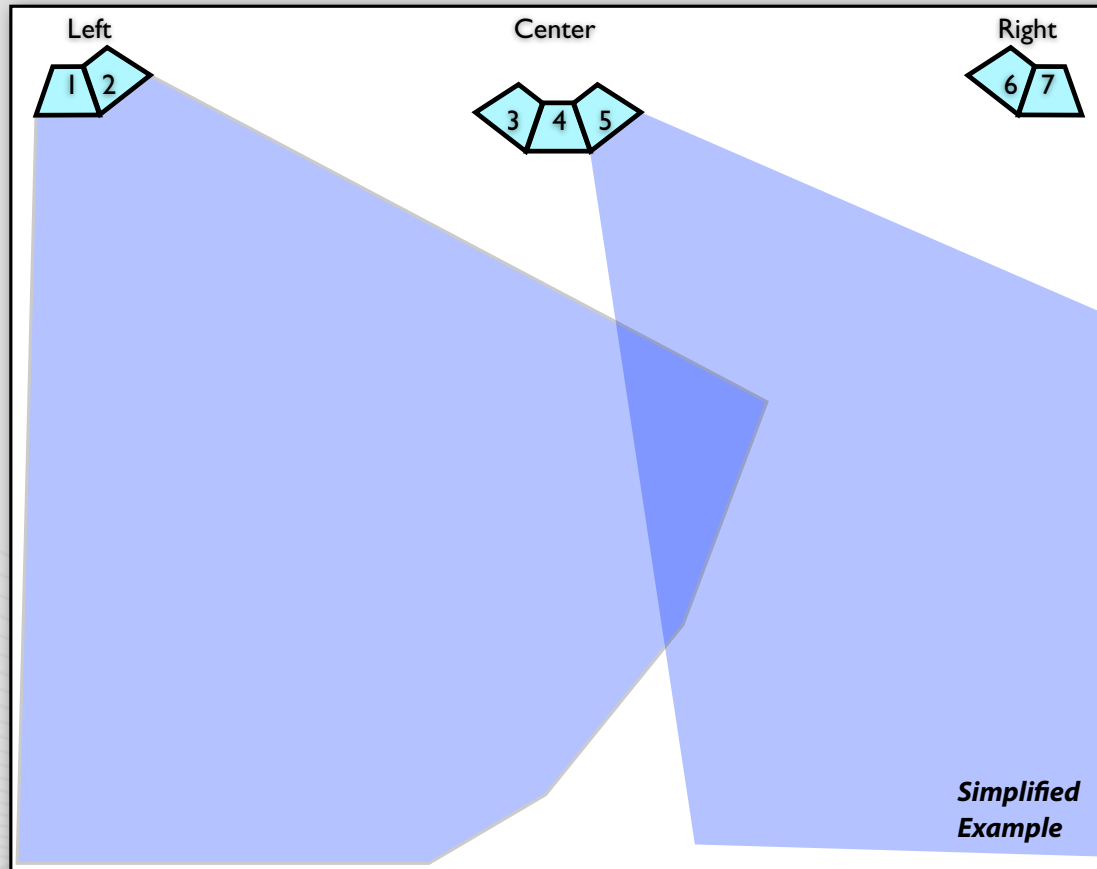


Signal Sent to Center:

- Matrix routes to 1, 3, 4, 5, 7
- 1, 7 Delayed for Time Align

Note: Center Cluster is filling most of the venue. Speaker 1 and 7 only used to fill front corners.

Cross Matrix LCR - Simplified

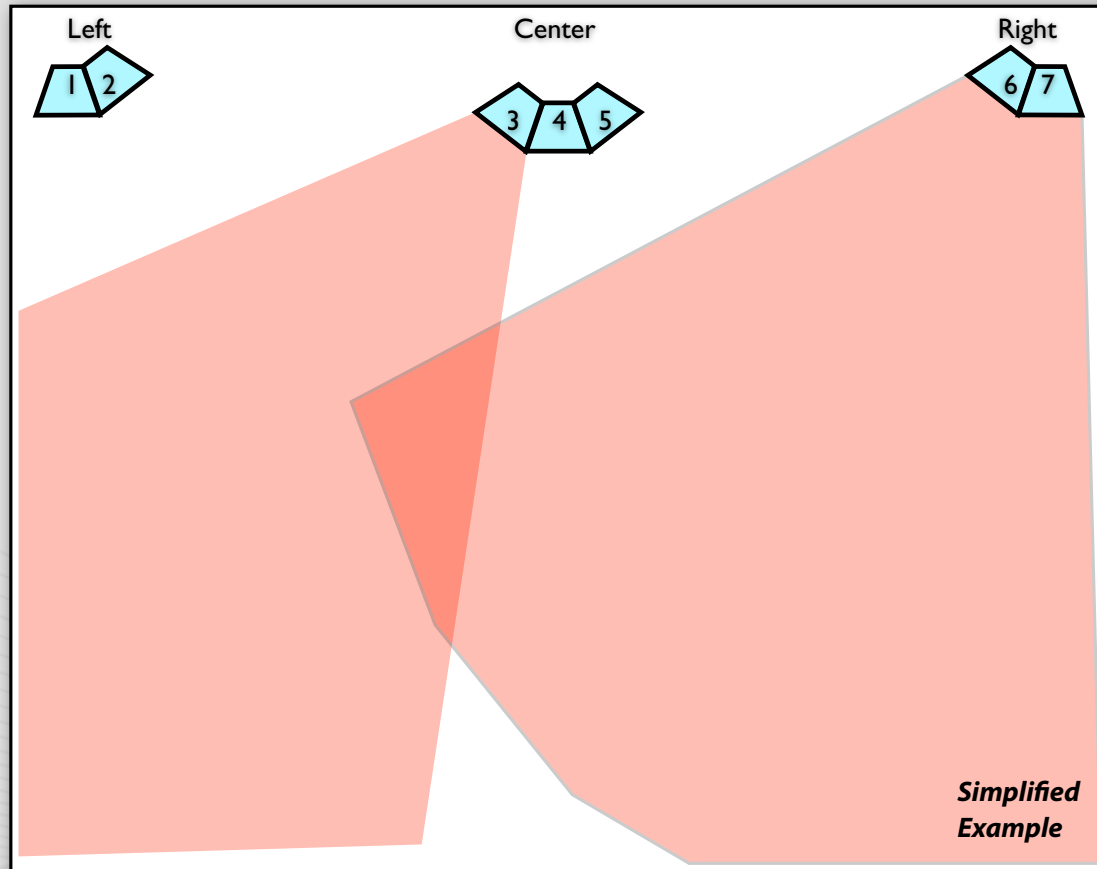


Signal Sent to Left:

- Matrix routes to 1, 2, 5
- 5 Delayed for Time Align

Note: Every listener perceives sound is from Left side.

Cross Matrix LCR - Simplified

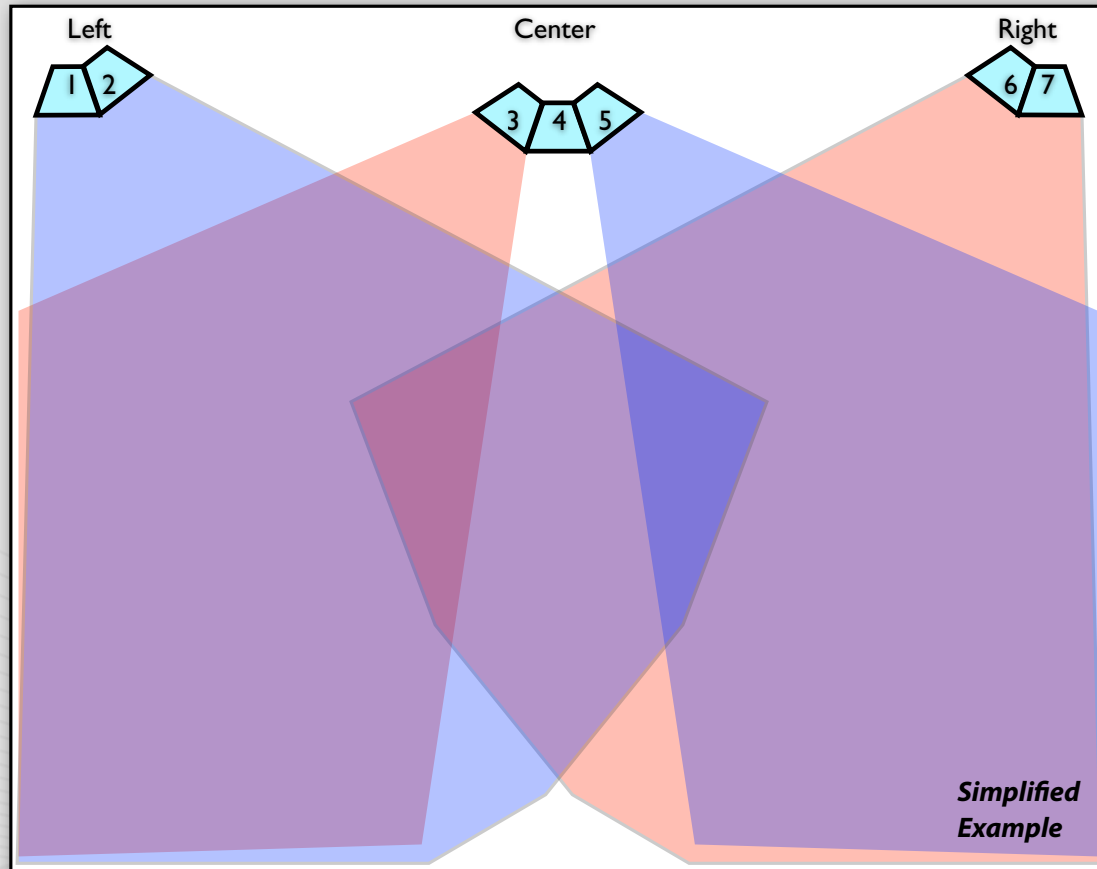


Signal Sent to Right:

- Matrix routes to 3, 6, 7
- 3 Delayed for Time Align

Note: Every listener perceives sound is from Right side.

Cross Matrix LCR - Simplified



Stereo Signal:

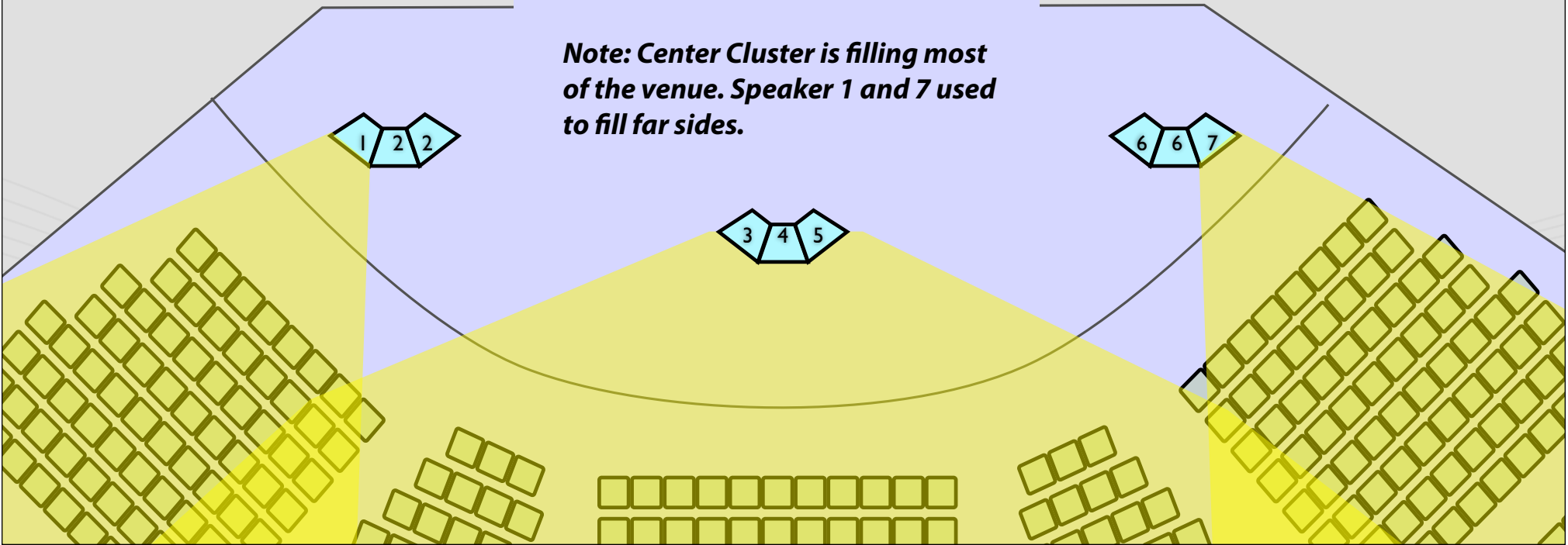
- Every seat in venue has some stereo image, even at far sides

Cross Matrix LCR - Wide Hall

Signal Sent to Center:

- Matrix routes to 1, 3, 4, 5, 7
- 1, 7 Delayed for Time Align

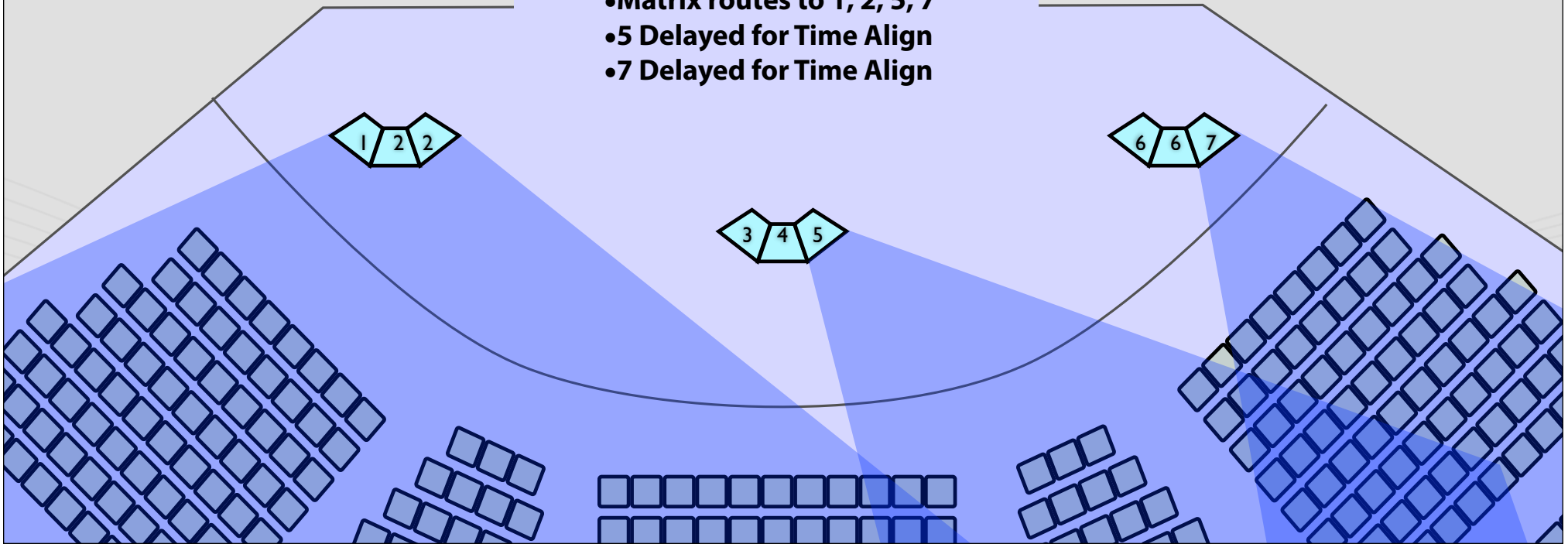
Note: Center Cluster is filling most of the venue. Speaker 1 and 7 used to fill far sides.



Cross Matrix LCR - Wide Hall

Signal Sent to Left:

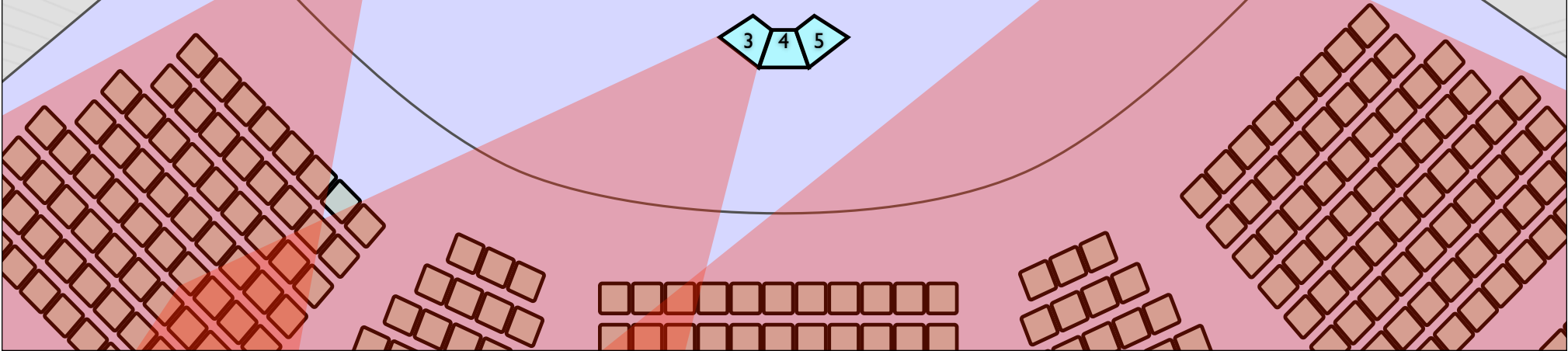
- Matrix routes to 1, 2, 5, 7
- 5 Delayed for Time Align
- 7 Delayed for Time Align



Cross Matrix LCR - Wide Hall

Signal Sent to Right:

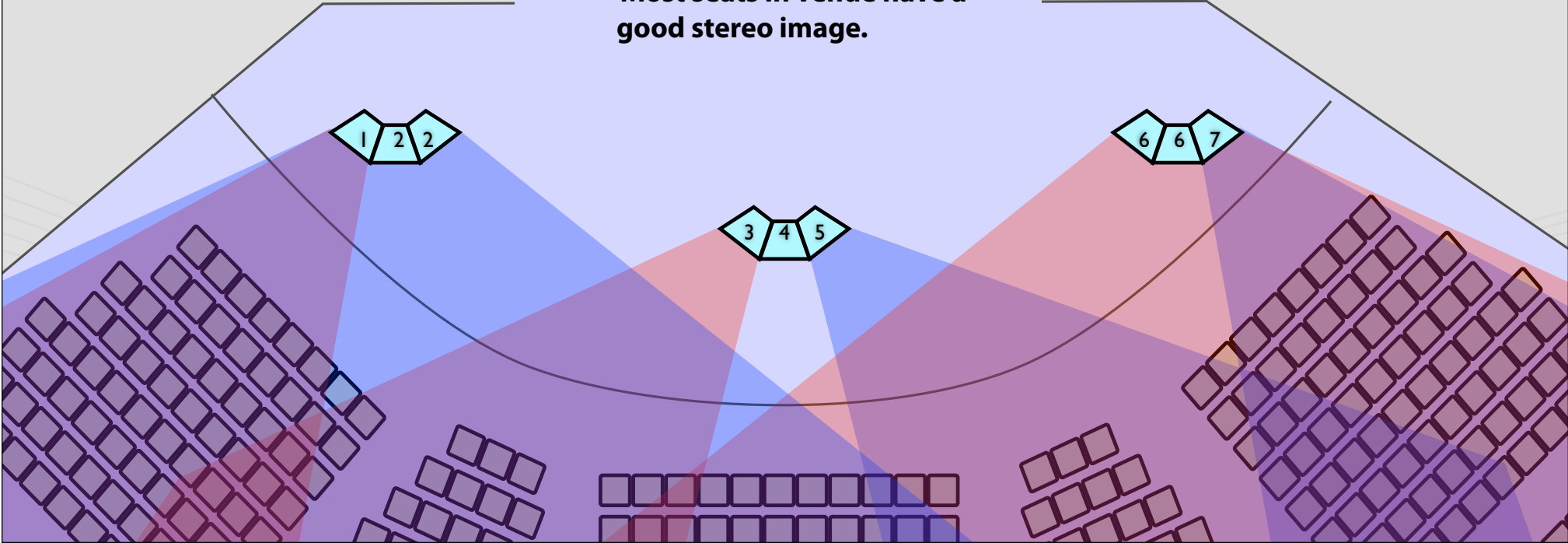
- Matrix routes to 1, 3, 6, 7
- 3 Delayed for Time Align
- 1 Delayed for Time Align



Cross Matrix LCR - Wide Hall

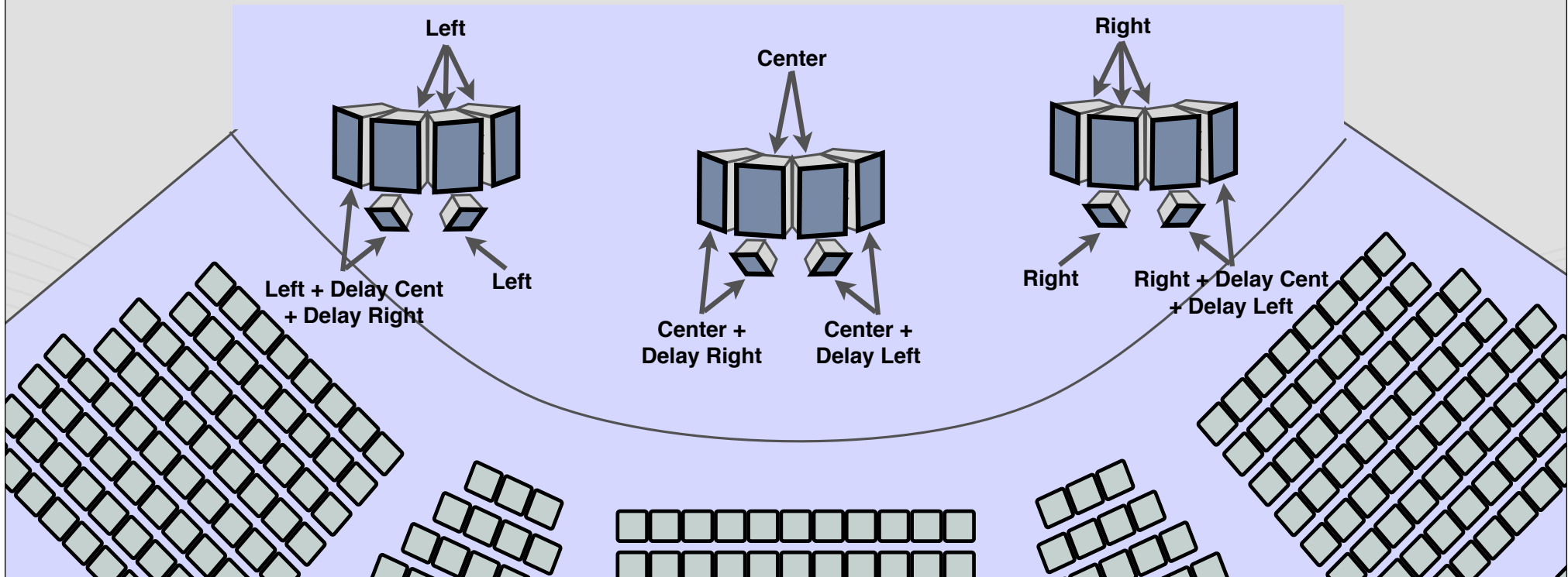
Stereo Signal:

- Most seats in venue have a good stereo image.

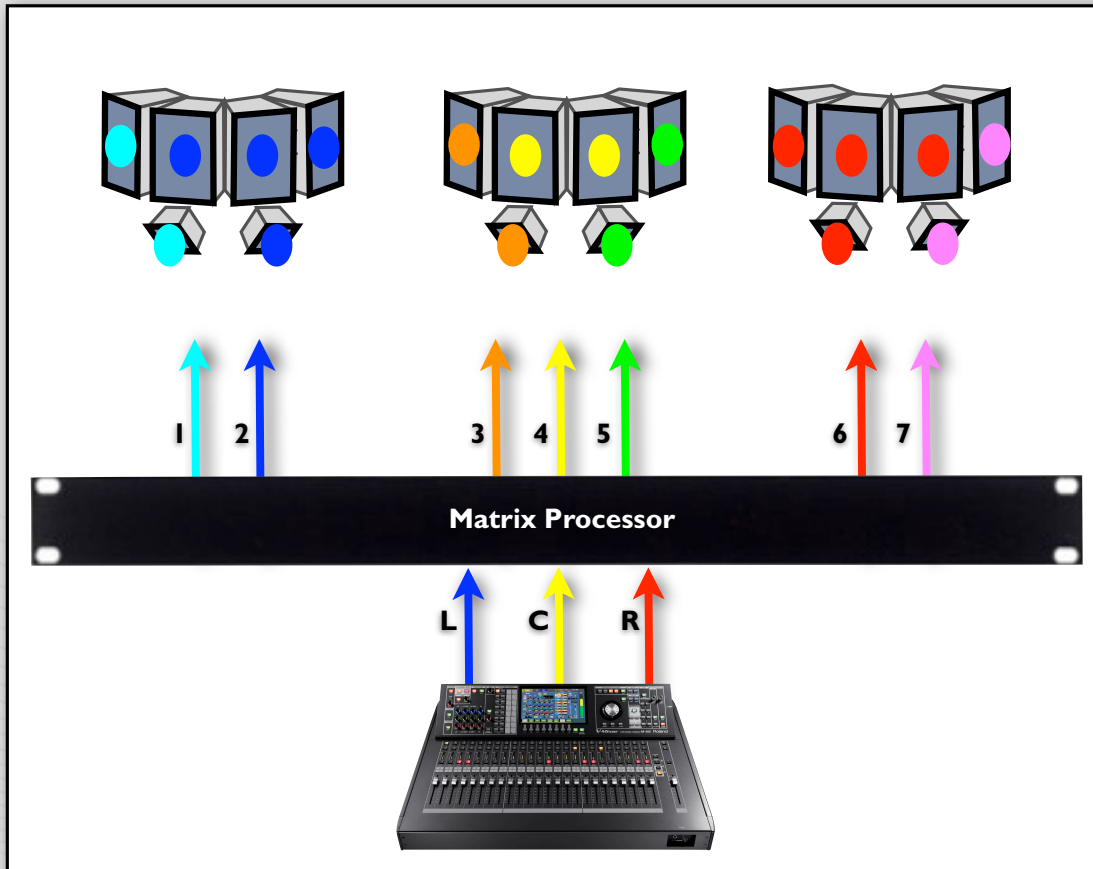


Cross Matrix LCR - Complex

The diagrams in this document are simplified to show the basic concepts. However, a typical Cross Matrix LCR System is more complex, with many speakers in 3 clusters or arrays. Here is one example. Under-balcony speakers and other fills that are not shown here add further complexity.



Cross Matrix LCR - one example



1 = Left + Delay Center + Delay Right

2 = Left

3 = Center + Delay Right

4 = Center

5 = Center + Delay Left

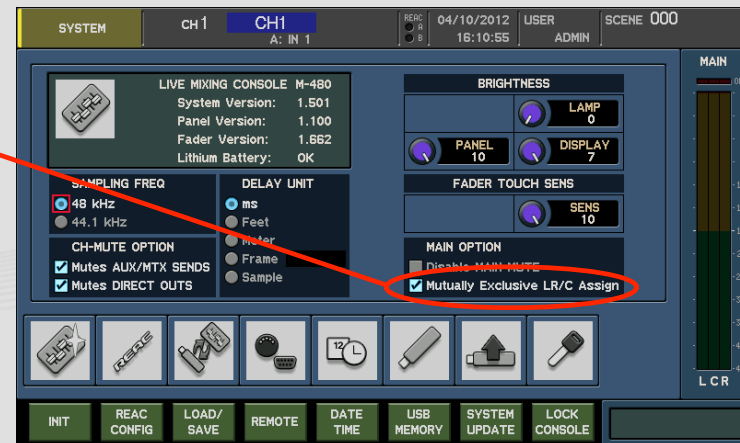
6 = Right

7 = Right + Delay Center + Delay Left

Cross Matrix LCR - V-Mixer Configuration

When using Cross Matrix LCR, a Matrix processor is used to setup preset convergence and delays on Main out speakers. If the FOH engineer sends a signal to multiple Main output busses, serious phase problems will occur. The user should not send any signal to [LR] and [C] at the same time. A signal can be sent either to [LR] or to [C]. With the [LR] mutually exclusive from the [C] bus, mixing with a complex Cross Matrix LCR becomes quite simple.

- When configuring a V-Mixer in a Cross Matrix LCR System, Select the “Mutually Exclusive LR/C Assign” option in the system settings.
- Turn off the LCR Convergence on all input channels.
- In some environments you might choose to lock users out of System Settings and Channel LCR setting.



Cross Matrix LCR - V-Mixer User Guidelines

Pan: Even with good time alignment and mutually exclusive [LR] and [C] most venues can suffer some smearing or phase problem with sound arriving from multiple locations, especially for seats at the far sides of the room. Some general hints for Pan settings:

- Spoken word, lead vocal, percussive sounds, and bass should usually be assigned to [C].
- When assigning a source to [LR] most sources should be either hard left or hard right to maintain best clarity. Piano, choir, synth, orchestra can usually be assigned in stereo. But it is best to have independent sources for Left and right. For example: Piano should have 2 microphones, one panned hard left and one panned hard right.

Keep the “Mutually Exclusive LR/C Assign” option selected in the system settings to avoid accidentally assigning sources to [LR] and [C] at the same time. No signal should ever be sent to [LR] and [C] at the same time.

Keep LCR Convergence turned off for all channels.