

A Quick Guide to Live Sound Matrix Mixing

By
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MATRIX MIXING

6x2 ?

7x4 ?

11x8 ?

A Quick Guide to Live Sound Matrix Mixing

MATRIX ?

12x4 ?

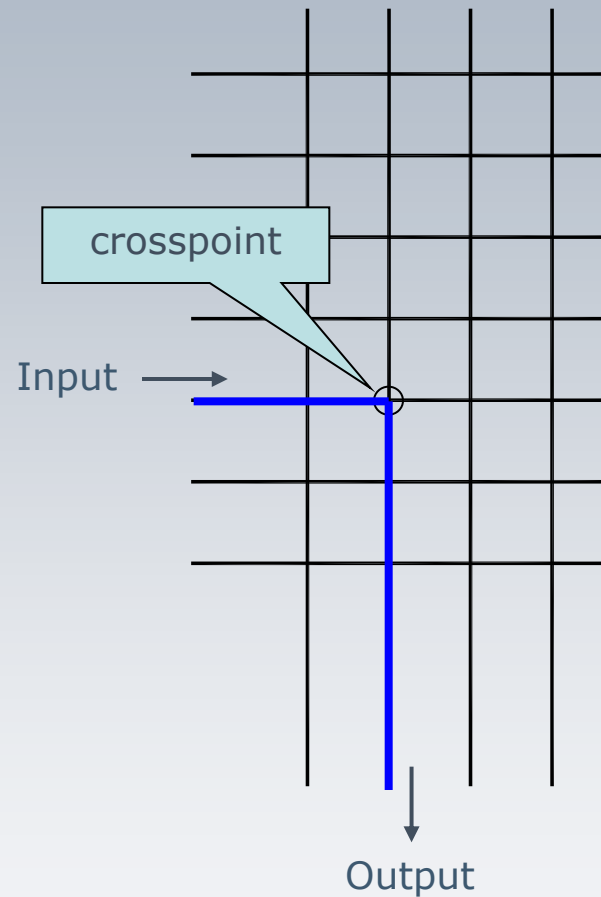
- What is a Matrix?
- How does it work?
- What can you do with it?

MATRIX MIXING

A basic definition:

A 'matrix' is a set of lines that cross at right angles

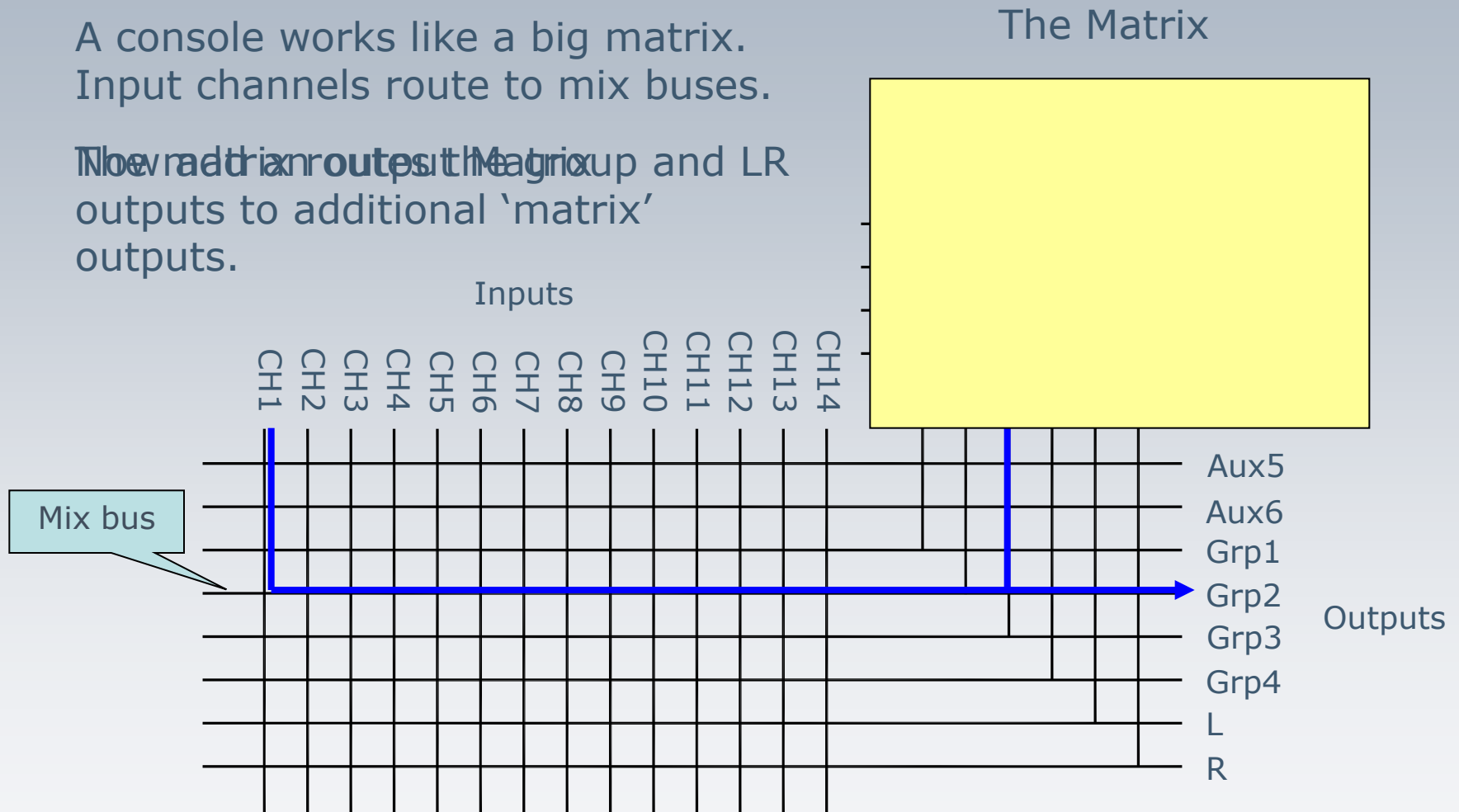
A grid to route inputs to outputs where the lines cross



THE MATRIX

A console works like a big matrix.
Input channels route to mix buses.

The **matrix** routes the Mix bus and LR
outputs to additional 'matrix'
outputs.



MATRIX MIXING

The Matrix is presented in one of 3 ways:

- As a 'mixer' in a mixer,
- Like an Aux send, or
- As a stand-alone mixer

Layout 1

A mixer in a mixer

The
Matrix

GL2400



ALLEN & HEATH

Matrix Mixer

A mixer in a mixer

A look at a typical master section:

Matrix section

Sub grouping

Group masters

Monitoring, Talkback

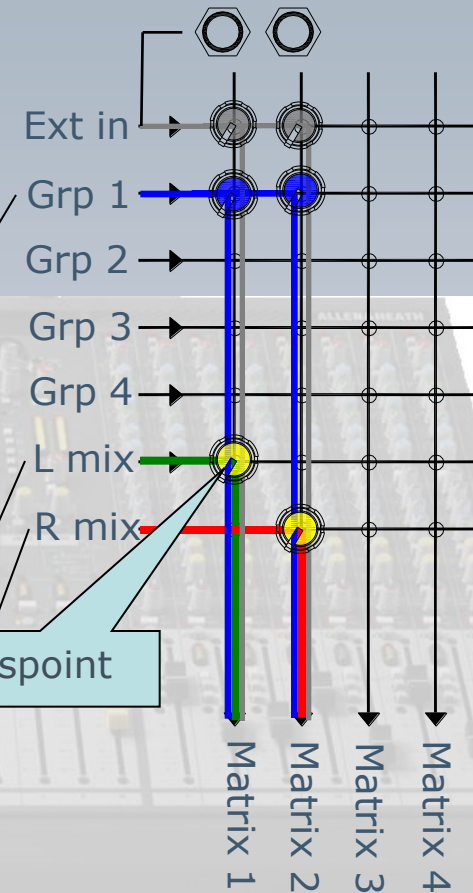
Aux masters

L,R,M masters

We build a matrix 'grid' where several sources can be routed to several matrix outputs.

The sources usually include the group mixes, LRM masters, and inputs to add in external signals.

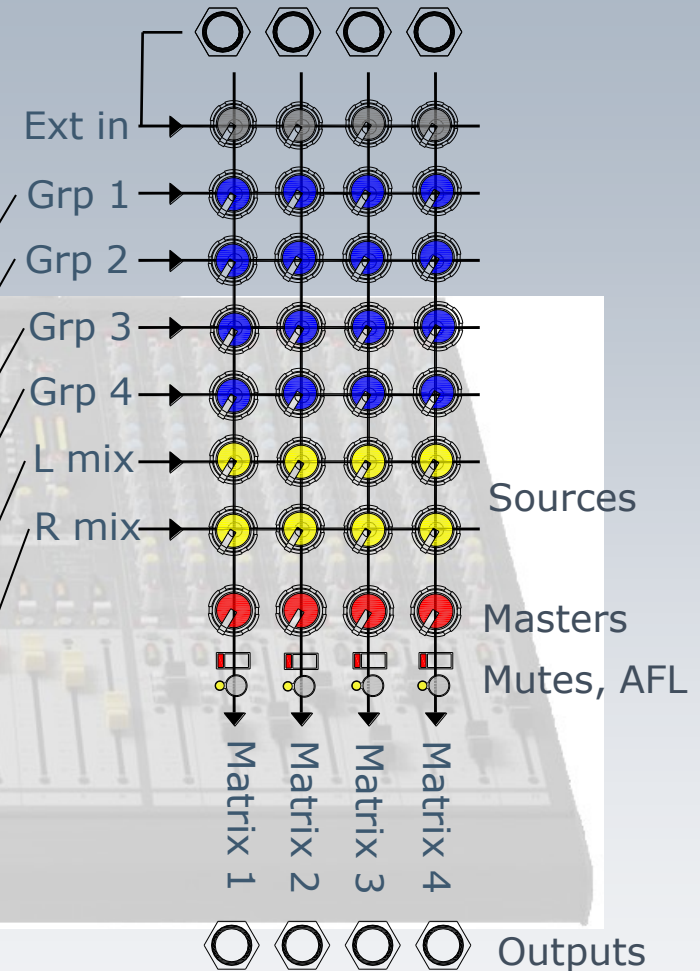
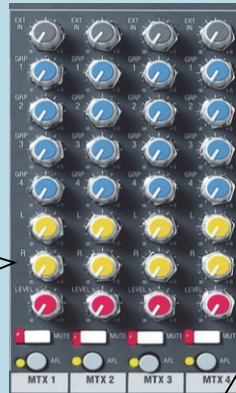
Signals mix to the outputs through level controls at the crosspoints.



A mixer in a mixer

7x4
Matrix

Now add the other
This example is, referred to as a '7x4'
Add the master controls. It has 7
sources and 4 matrix
outputs
And route to the
matrix output sockets



Layout 2

A bit like Aux sends
from the masters

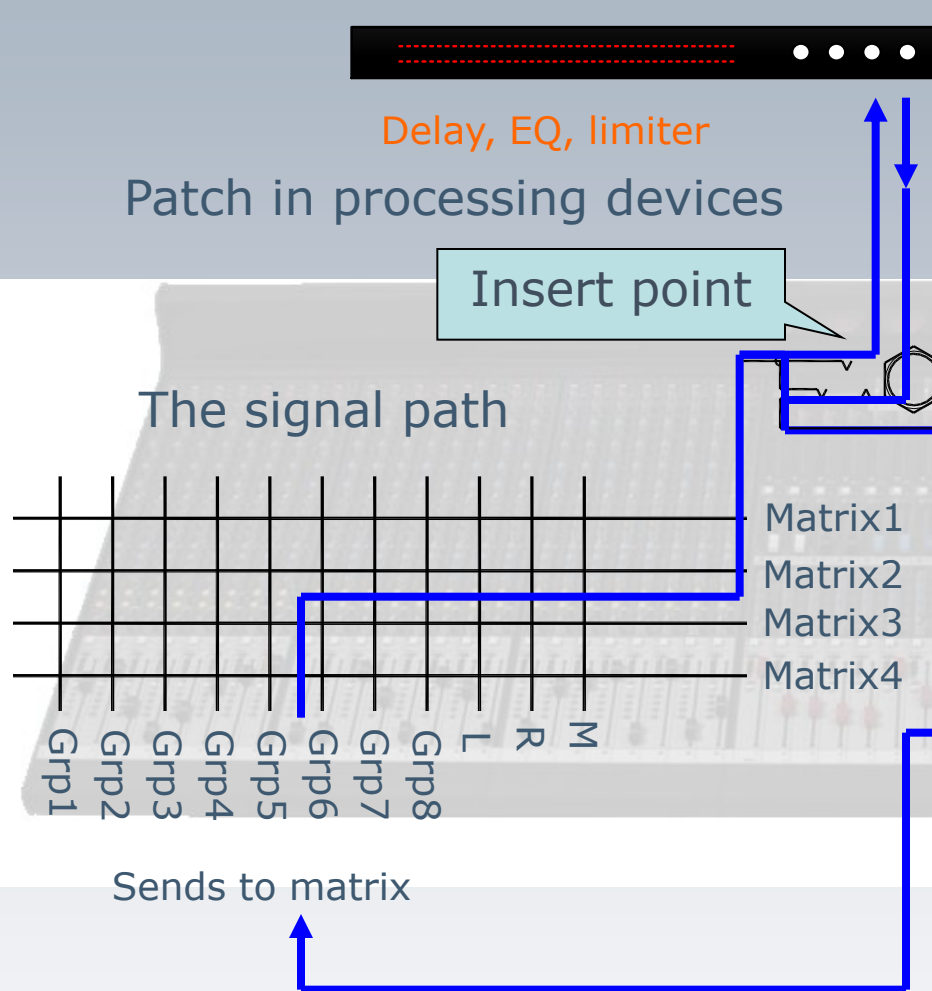
The
Matrix

GL4800

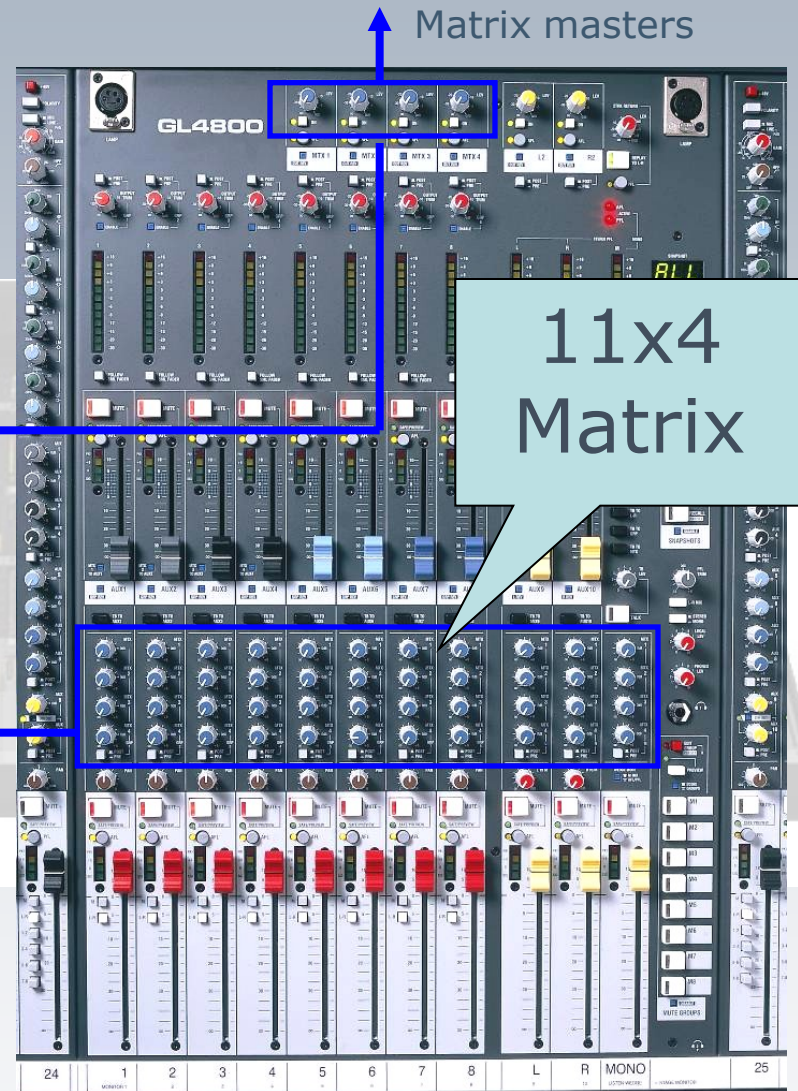
Matrix masters

Sends from the
groups and LRM





This example is referred to as an '11x4' matrix. It has 11 sources and 4 matrix outputs



MATRIX MIXING

Layout 3

Stand-alone matrix mixer

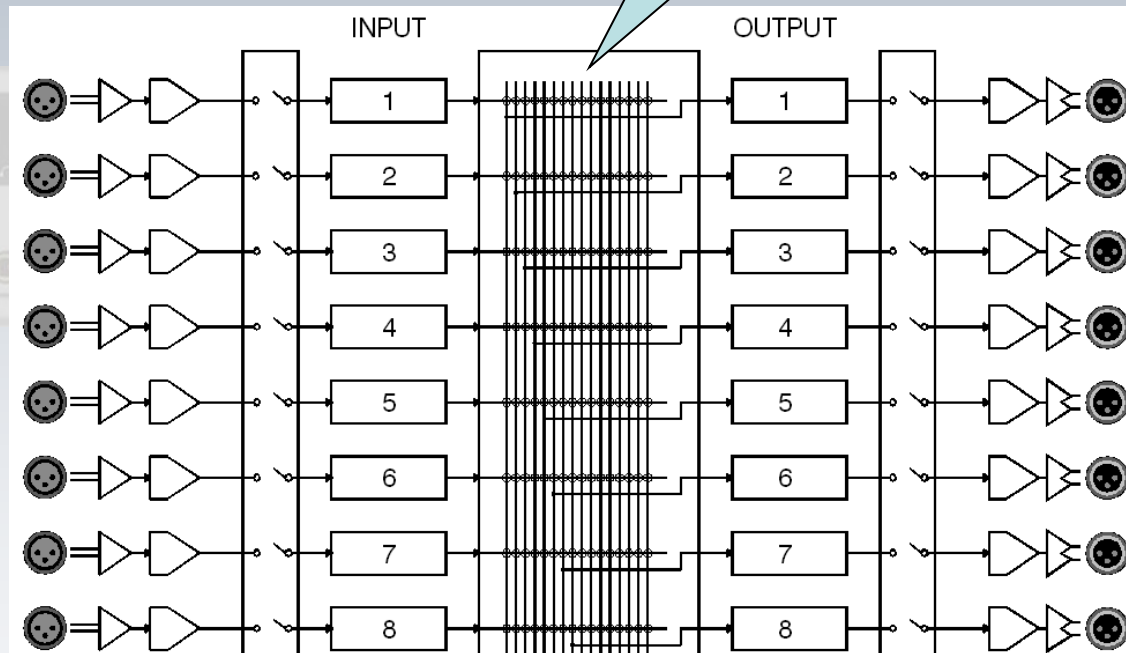
Example - A DSP mix processor such as the **iDR-8**



Matrix mixer

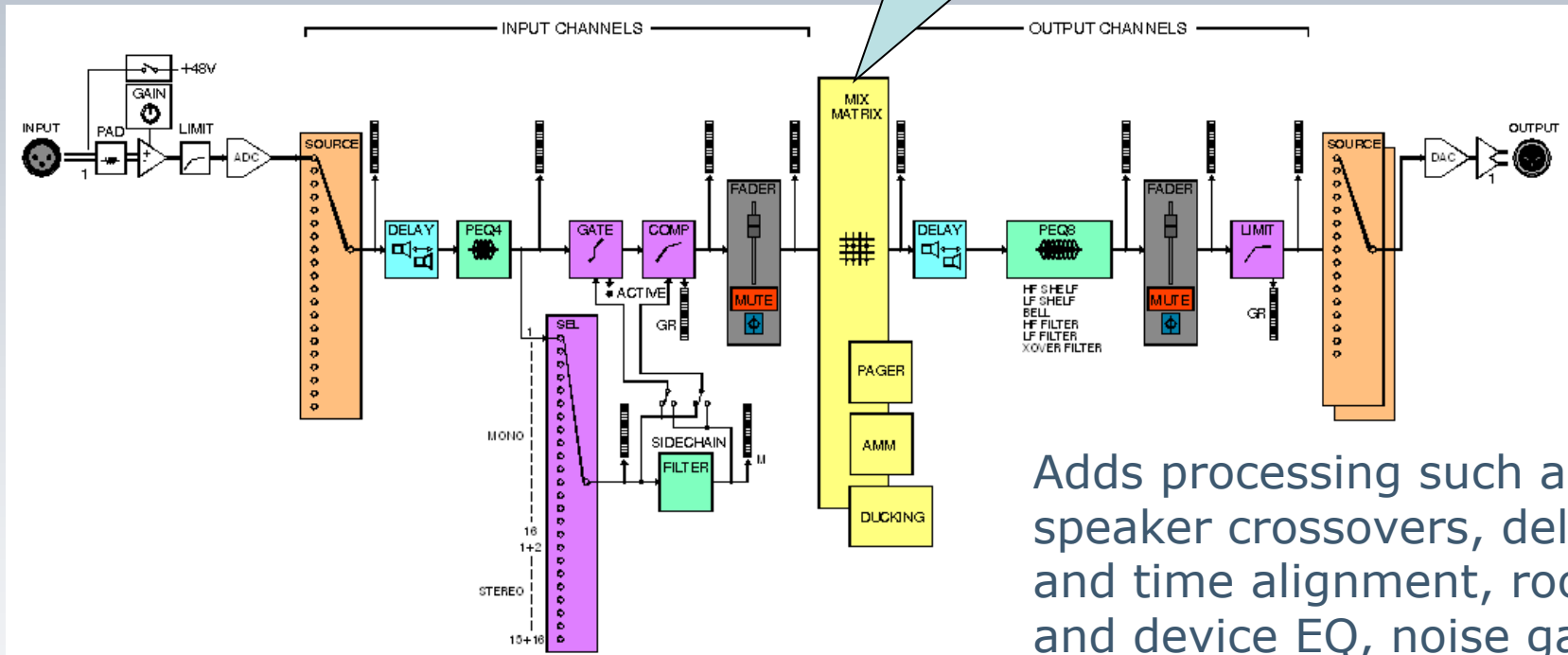
Crosspoint matrix

A matrix of many inputs to many outputs



Matrix mixer

Crosspoint
matrix



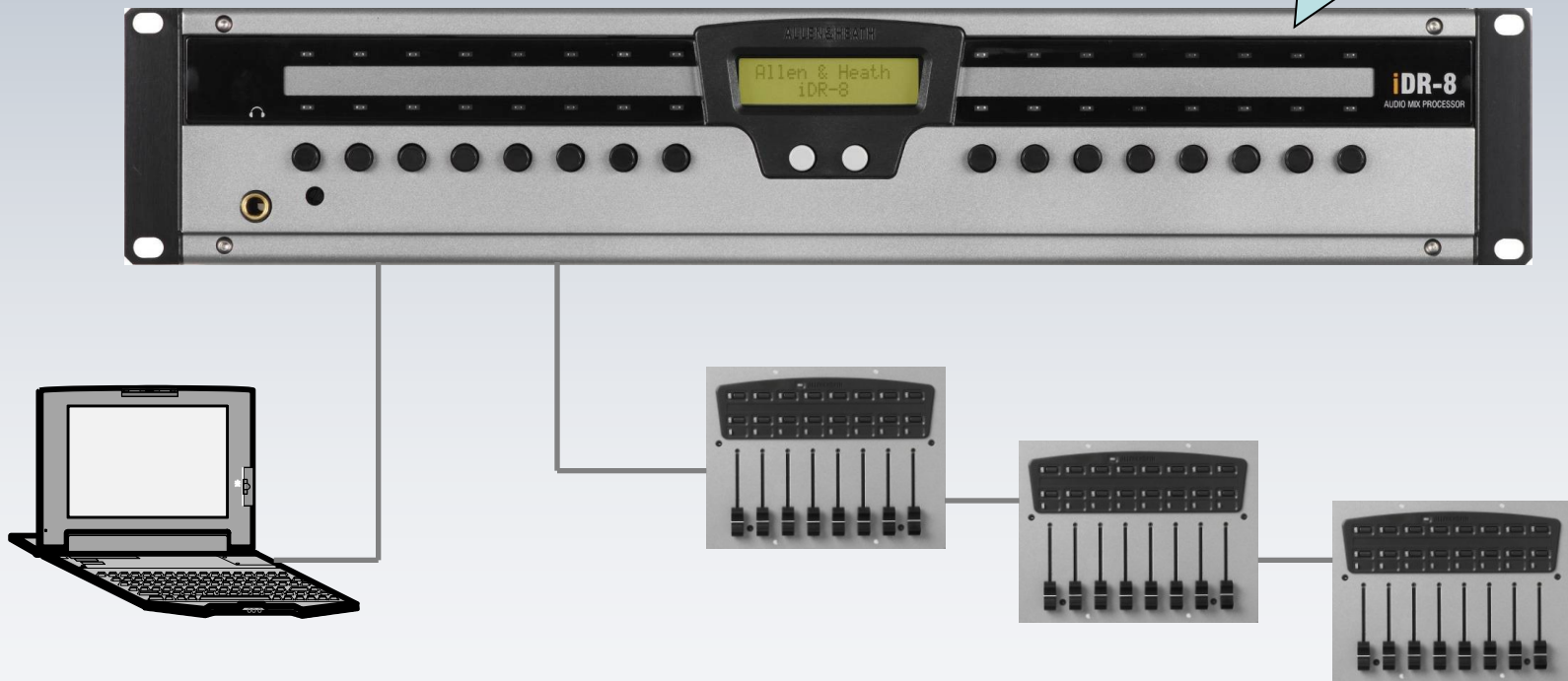
Adds processing such as speaker crossovers, delay and time alignment, room and device EQ, noise gates, compression and protection limiting

Matrix Mixing

Matrix mixer

Adds remote control such
as network, wall plates,
fader controllers, MIDI,
touch panels and more...

16x16
Matrix



ALLEN & HEATH

NEEDS & MIXING

A look at what you can do with it:

Equipped and ready!



The Matrix – a toolbox of useful outputs:

- Extra mix outputs
- Combine L+R for mono
- Live recording
- Delay fill speakers
- Cry room feed
- Hearing loop feed
- Backstage monitor
- Mono or stereo IEM
- Headline/support console link
- Broadcast feed
- Video feed
- Reduced image stereo fills
- Create stereo Auxes
- Add room ambience

No job
impossible!



The Matrix – many advantages:

- Each output has an independent level trim
- Create mono or stereo feeds
- Create feeds with reduced stereo image
- Create a different balance to compensate for the acoustics
- Add room or stage ambience
- Add stereo presence to a mono aux
- Insert processors such as delay, EQ, limiting...

WIRELESS VIDEO

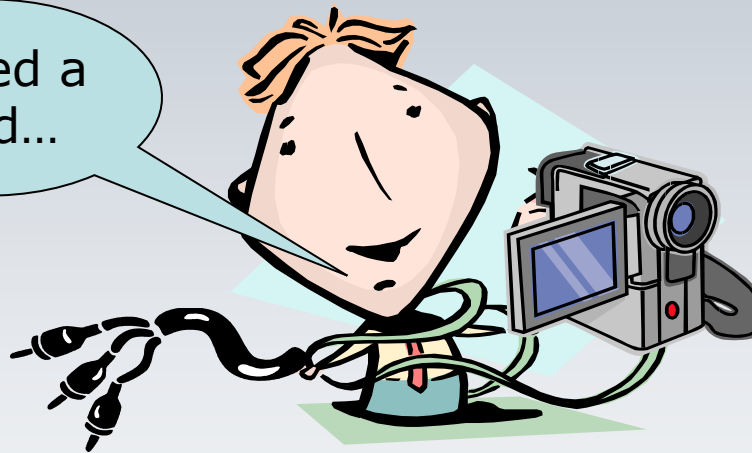
Yes, I can do it!



So when the video guy comes up just before the show...

You are ready!

I need a feed...



MATRIX MIXING

Now, a few application examples

MATRIX MIXING

Application 1

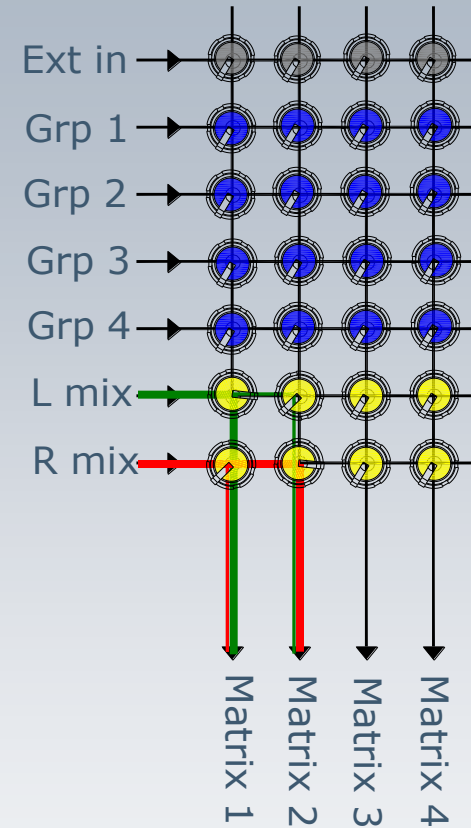
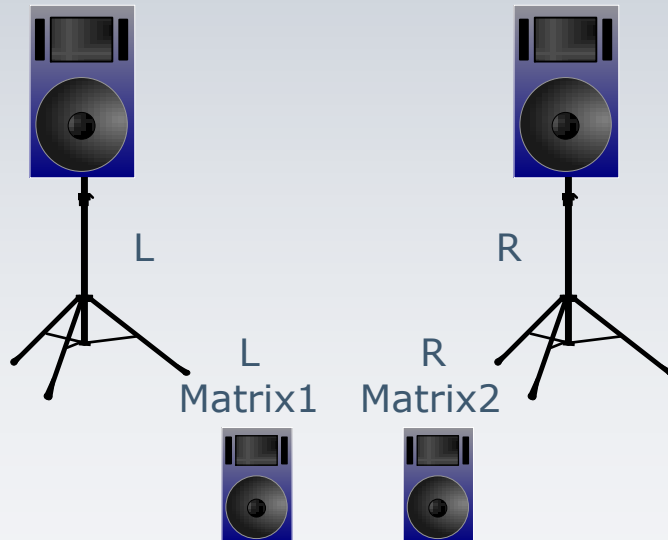
Extra LR outputs

Matrix Mixer

Application 1

Extra LR outputs

To feed additional centre and surround speakers



Send p1 p2 p3 p4 p5 p6 p7 p8 p9 p10 p11 p12 p13 p14 p15 p16 p17 p18 p19 p20 p21 p22 p23 p24 p25 p26 p27 p28 p29 p30 p31 p32 p33 p34 p35 p36 p37 p38 p39 p40 p41 p42 p43 p44 p45 p46 p47 p48 p49 p50 p51 p52 p53 p54 p55 p56 p57 p58 p59 p60 p61 p62 p63 p64 p65 p66 p67 p68 p69 p70 p71 p72 p73 p74 p75 p76 p77 p78 p79 p80 p81 p82 p83 p84 p85 p86 p87 p88 p89 p90 p91 p92 p93 p94 p95 p96 p97 p98 p99 p100

MATRIX MIXING

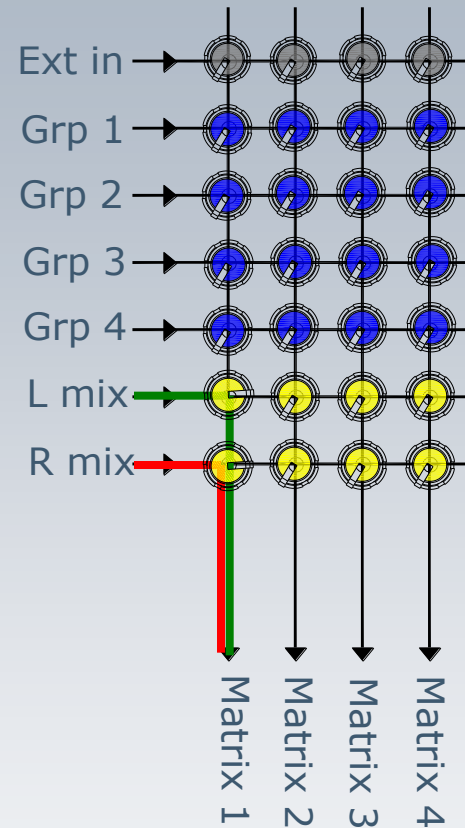
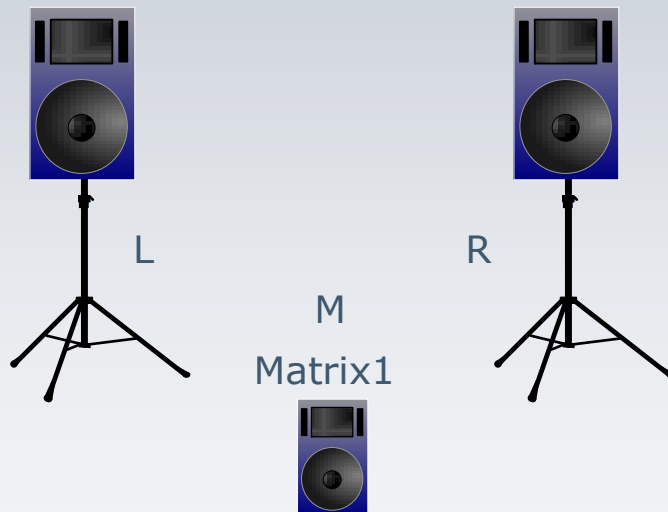
Application 2

Create a Mono Fill

MATRIX MIXING

Application 2

Create a Mono Fill



Mix L and R together to
one matrix output

MATRIX MIXING

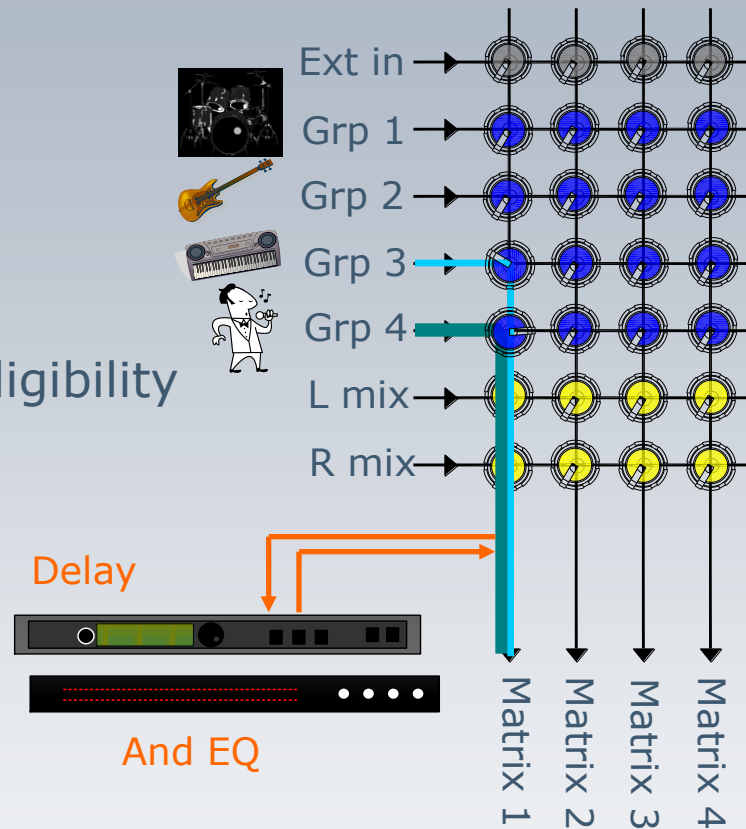
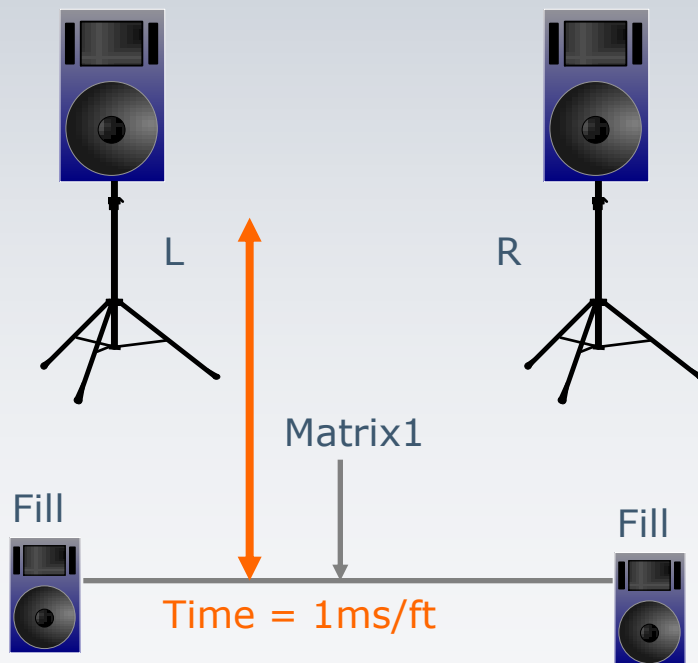
Application 3

Create a Delay Fill

Application 3

Create a Delay Fill

Rear stalls, under balcony intelligibility



Compensate for the delay
Start with just the vocals
and quieter instruments
Patch in a delay unit,
and EQ to filter out some
LF and HF

Application 4

Live Recording

MATRIX MIXING

Application 4

First, consider the live gig...

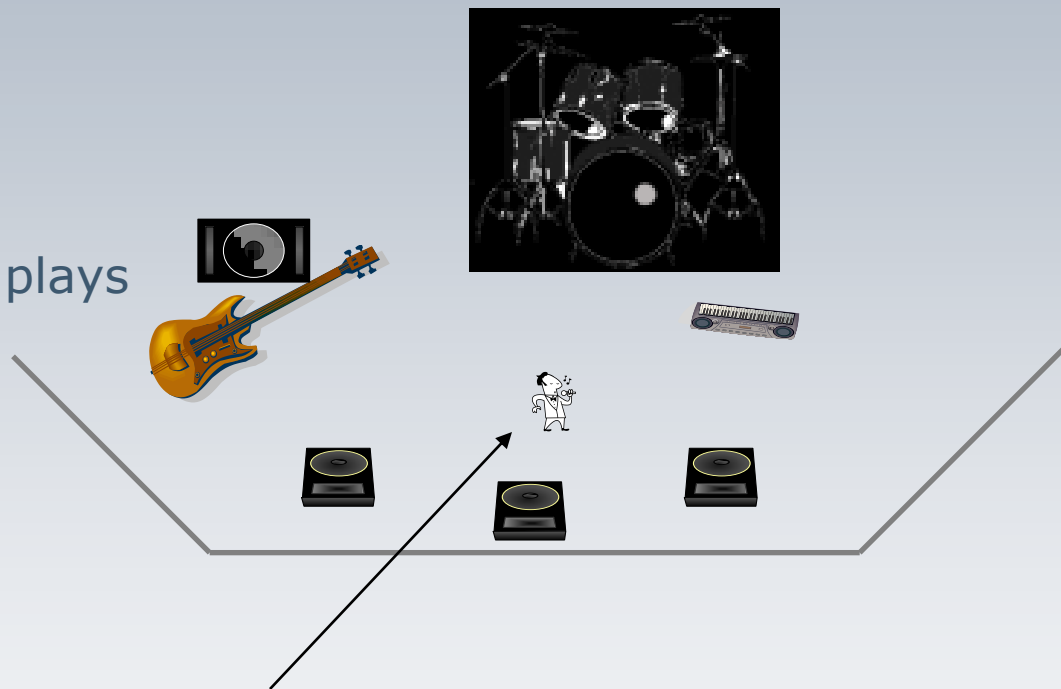
Introducing the band



MATRIX MIXING

Application 4

The band plays

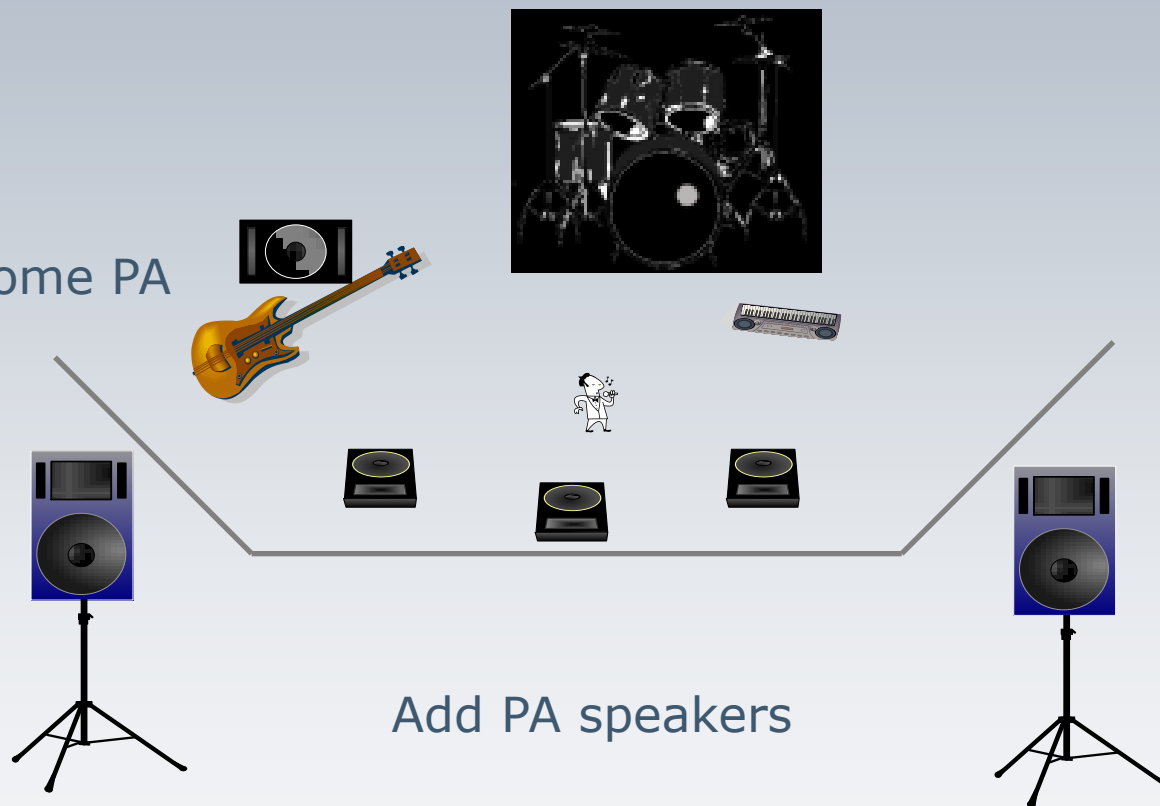


The instruments are so loud, the voice and keys are lost...

MATRIX MIXING

Application 4

So, we need some PA



Add PA speakers

MATRIX MIXING

Application 4

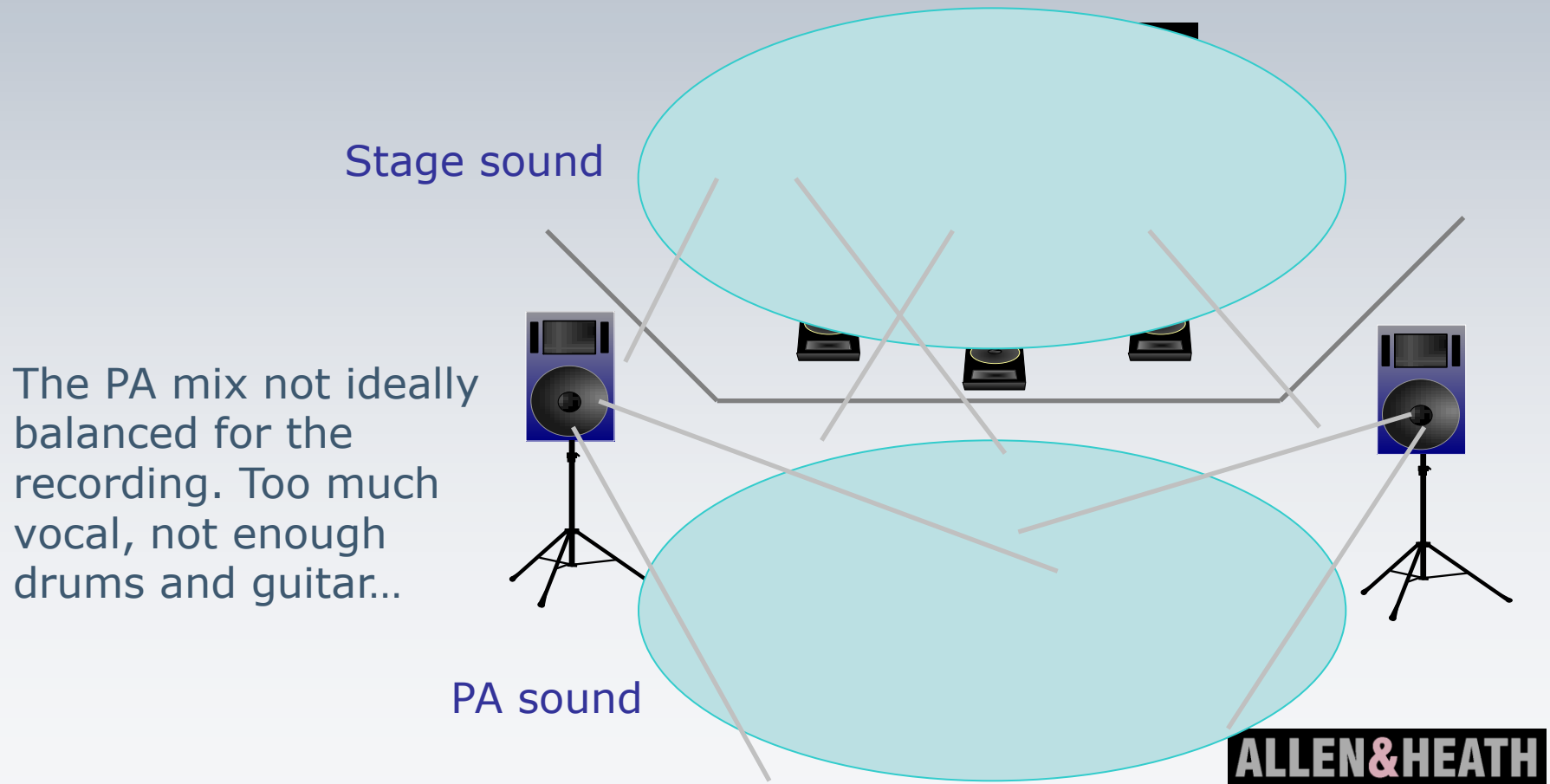
Balance the sound



MULTI-MIXING

Application 4

The listener hears both the **stage** sound and **PA** sound



MATRIX MIXING

Application 4

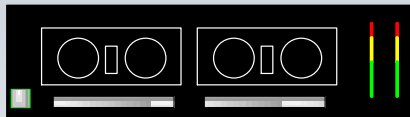
We need to re-balance the mix for the recording

The solution is to
use the matrix

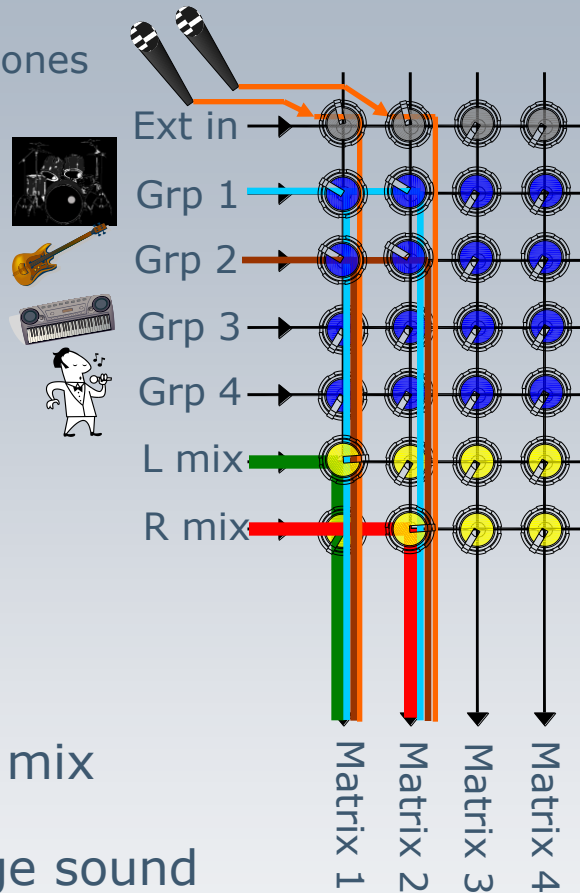
WUZZARD

Application 4

Live Recording



Room microphones



Start with the stereo PA mix

Compensate for the stage sound

Add room ambience

The recording is now properly balanced and includes live ambience

Application 5

In-ear Monitor Mix

An application for the matrix on a monitor console
A solution to the problem of 'not enough Auxes'

GL2400



For example:

6 Auxes = 6 Wedges

4 Matrix = 4 mono IEM
or 2 stereo IEM

Total = 10 monitor mixes

Application 5

In-ear Monitor Mix

Closed ear means the musician needs the full mix



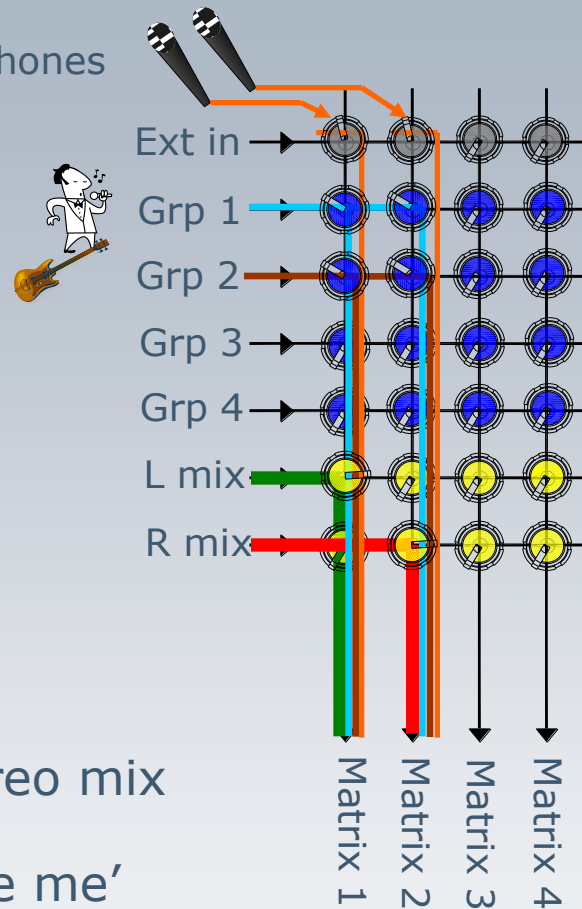
Start with a general stereo mix

Use Groups to add 'more me'

Use Groups to add more of requested sources

Add stereo room ambience

Room microphones



MATRIX MIXING

Application 5

The Matrix is a quick way to create mono or stereo in-ear monitor mixes

Application 6

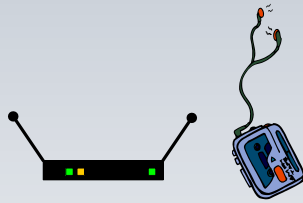
Convert a Mono Aux to Stereo

Add stereo instruments and presence to a mono Aux mix
Another way to create stereo in-ear monitor mixes

MATRIX MIXING

Application 6

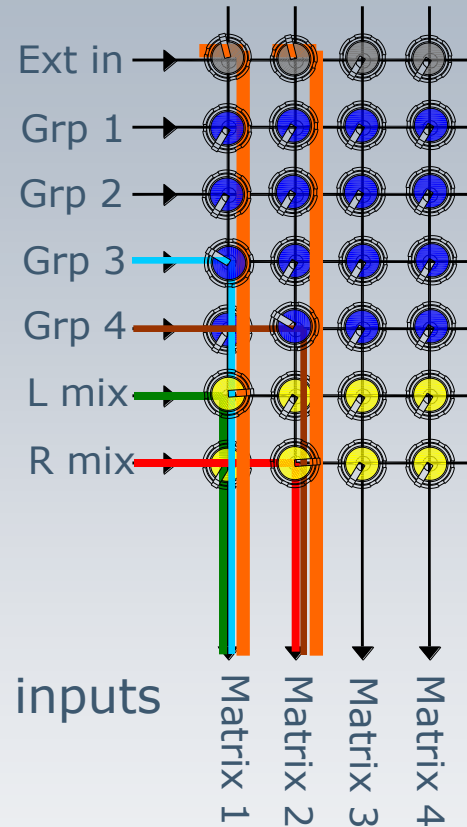
Convert a Mono Aux to Stereo



Patch an Aux into two matrix inputs

Add a general stereo mix

Use Groups to add reverb and ambience



Application 7

Link Consoles

Link headliner and support act consoles into the same PA

Application 7

Support
act console



Link Consoles to the PA

Feed the PA from
Matrix 1 and 2

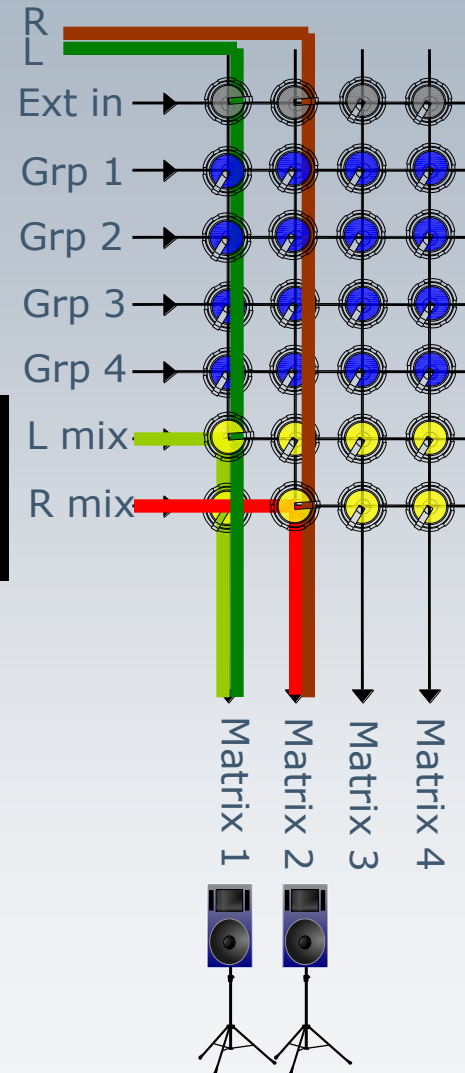


Headline act console

Route LR to the PA

Route external LR to the PA

The two consoles mix with independent
level control via the matrix



MATRIX MIXING

And the list goes on...

MATRIX MIXING

No job
impossible!



In Summary:

- The Matrix is a useful set of extra outputs
- It lets you create an intelligible mix for fill speakers
- It lets you create a better balanced live recording
- It adds to the capability of a monitor console
- It overcomes the problem of 'not enough Auxes'
- And... it is available on most ALLEN & HEATH consoles!

The Matrix

GL3800



ALLEN&HEATH

MATRIX MIXING

For more information:

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careyd@allen-heath.com

Enjoy your mixing!