

Concert Sound Training Agenda V1.0

Concert Sound Training Agenda:

Day 1 (Theory)

Start: 9:00

Lunch break: 13:00-14:00

End: 18:00

1 Introduction

- Live Sound History
- Different Purposes of Sound Systems

2 Why do we need a PA System?

- Introducing the signal/device/effects chain
- Sidekicks to all topics 2.1 ... 3.n

2.1 Nature of Sound, Basic Acoustics

- Waves & Particles,
- Power, Intensity, Impedance
- Pressure, Particle velocity, Propagation velocity,
- Frequency & Wavelength
- Speech, Music, Noise
- Hearing window (frequency, pressure)
- Psychoacoustics (Precedence effect, directional detection, masking)

2.2 The Open Space

- Inverse Square Law
- The Decibel and the SPL
- Signal/Noise Ratio

2.3 The Room Challenge

- Direct Sound
- Reflection, Absorption, Transmission, Diffusion
- Diffuse or Reverberant Field
- Reverberation (RT60) Reflections/Echoes
- The Total Sound Field (Hopkins-Stryker-Equation)
- Direct/Reverberant Ratio (as a qualifier of performance)

3 The Sound System Chain (interaction of components)

3.1 Speakers, Driving the Air

- Transducer Principles (dynamic, ribbon, ...)
- Properties (Frequency & Dynamic Range, Sensitivity, Efficiency, Power handling, ...)
- More Properties (Coverage Angle, Polar Patterns & Directivity)
- Multi-Driver Devices (Passive, bi-amped, tri-amped, ...)
- Multiple Speaker Effects (Comb-Filtering, Coupling, Polarity)
- Speaker Arrays (tailoring Polar Patterns & Directivity, single speakers, stacks and line-arrays)

Day 2 (Theory continued)

Start: 9:00

Lunch break: 13:00-14:00

End : 18:00

3.2 Power Amps, Watts up

- Power Amp Basics & Principles (Class AB, class H,

Concert Sound Training Agenda V1.0

Switching, Voltage, Current, Low-Z, 100V/70V,...)

- Purpose of Power Amps (Voltage, Current, Damping, Protection, Size, Gain ...)

3.3 Signal Processors, Signal conditioning

3.3.1 Equalizers, Filters, Add and Reduce Devices

- EQ Principles (Frequency & Time Domain, graphic, parametric, shelving, cut, roll-off, boost, ...)

- Purpose of Equalisation (Source, Room, Speaker, ...)

3.3.2 Dynamics, Level Controllers and Emergency Brakes

- Dynamics Principles (Gate, Limiter, Compressor, Expander, ...)

- Purpose of Dynamics (Source, Room, Speaker, ...)

4 Line Array Theory

- Coherent farfield summation - the Hydra story

- Nearfield/Farfield considerations

- J-shape vs straight line

- why and how use LAPS

- EQ-ing for different hang configurations + sizes

- Groundstacking Line Arrays

- Use of fill speakers (Xi, Plasma, FRi...)

- Subwoofer configurations for Line Arrays

5 System dependant X-Line OR XLC OR XLVC (theory)

- Elements Description (e.g. XVLS, XVLT, XSUB-F, XSUB)

- Mechanics description (flying hardware,...)

- Safety & Maintenance considerations

- LAPS

- IRIS (quick intro)

- Amp rack configurations

- Processing options & Presets (DN9848, DX38, P3000RL)

- Typical System Configurations

Day 3 (Hands on)

Start: 8:30

Lunch break: 12:00 - 12:30

End: 15:00

- Get room geometry
- Plan hangs using LAPS
- Set up amp wiring
- Set up hangs and groundstacks (subs)
- Set up fill speakers
- Trim System (EQ, Delays..)