

Basic Sound Seminar Outline

by Michael Dow

PRE-CLASS HOMEWORK

- Read "The Essence of Sound Reinforcement" in the Handouts
- Read Sound Glossary in Handouts (make notes of misunderstood words)
- Look through the entire manual and get aquatinted
- Bring a diagram of your churches Sound System (if you can)

Day 1 - Intro./System Overview/Mics/Mixers

Introduction

1. Student backgrounds and expectations
2. Course objectives - *discuss this Outline*
3. Class Hours - 10:00 - 6:30 (Saturday) with a lunch break @ 12:30
4. Documentation - *discuss Sound Manual and Text Books*
5. Coffee and Soda

A. System Interconnection - Various Chapters

1. What is Sound
2. Sound Facts
3. Human Hearing Curves - (*Handouts*)
4. Frequency/HZ - *tone generator/ oscscope/spectrum analyzer* - (pgs. 24 & 26)
5. Phase Cancellation - (pg. 26)
6. SPL/dB - *dB meter and chart in Handout Section* - (pg. 27) - **demo volume**
7. Basic Sound System
8. KKH System Diagram
9. Consumer vs. Pro Audio
10. Sound System Levels Chart
11. Signal levels - mic, line & Spkr - (pg. 120 & *Handouts*)
12. Impedance - adapters & direct boxes (*Handouts*)
13. Balanced vs. Unbalanced - (pg. 124 & 125) - *Demo Connectors*
14. Gain Structure - (pg. 143)
15. Dynamic Range - (pg. 138)
16. System Grounding - (pg. 132)
17. Noise - *RFI, 60HZ Hum, buzz, SCR Hash*
18. Microphones
19. Mixers - Basic to Digital
20. EQ's - *tone controls to room EQ- freq. demo* - (pg. 74 & 75)
21. Amps
22. Output load (ohms) - (pg. 89)
23. Clipping
24. Crossovers - Analog to SoundWeb
25. Speakers - - *pass around speakers* (pgs. 92 & 93)
26. Speaker Systems - LCR System & Speaker Coverage
27. Feedback
28. Room Tuning

LAB: Identify system components

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Switch to OVERHEAD Projector

B. Block Diagram

1. Discuss KKH PA block diagram - **SHOW** (*Handouts*)
2. Discuss Home Church block diagram - (*Handouts*)
3. Discuss drawing your own system

LAB: check out Main Sanctuary PA

- Show stage boxes
- Show Amps
- Impedance Adapters
- Direct Boxes
- Transformer Box
- System power switches
- Patchbays
- Splitter
- Studio Control Room

C. Microphones - Chapter 5

1. Microphone Types:
 - Dynamic - (*pg. 45*)
 - Condenser - (*pg. 45*)
 - **Contact** - (*pg. 48*)
2. Phantom Power - (*pg. 55*)
3. Mic Selection chart – (*handouts*)
4. Polar Patterns - (*pg. 49*)
5. Data Sheets - (*Handouts*)
6. Mic Line Splitter box - transformer
7. Wireless Mics - - *Examples - Demo (Mic Section)*

 **SHOW & EXAMPLES - Demo**

LAB: Identify mic type and sound quality

D. Mixers - use demo system

1. Basic mixer signal flow – (*Handouts*)
2. Block Diagram glossary - (*pages 35 & 36*)
3. Mixer Application - (*Handouts*)
4. Spirit NotePad Mixer Diagram - (*Handouts*)
5. Basic Demo
6. Soundcraft K² Block Diagram - (*Handouts*)
7. Digital Mixers - (*Handouts*)

LAB: Play with mixers and follow signal flow

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Day 2 - Outboard Equipment Outbd/ EQ./Amps/Spkrs/Setup/Debug/Decks

E. Outboard Equipment

1. Equalizers
2. Compressor/limiters
 - Uses
3. Digital Effects

F. Crossovers & Biamping - PPT

1. Passive - (pg. 78) (Handout)
2. Active - (pg. 99) (Handout)
3. Crossover Slopes
4. Rane analog crossover
5. BSS Omnidrive Compact Digital System Processor - (Handouts)
6. Demo Soundbench

G. Digital System Processor - PPT

1. BSS Soundweb - (Handouts)
2. Demo Sound Designer

H. Amplifiers - Chapter 8 - PPT

1. Crown K2 - front & rear view
2. Specifications - (pg. 83)
3. Damping Factor - > 100 is good (pg. 87)
4. Not All Amps are EQUAL!!!!
5. Clipping - (pg. 88)
6. Rane Tech Note 128 (Handouts)
7. Speaker impedance calculations - (pg. 89)
8. Line Loss - **SHOW Handout** (ohms per foot - Handouts)
9. Bridging - (pg. 87)
10. 70V "Muzac" Distributed speaker system - show example (pg. 101)

I. Speakers - Chapter 9 - PPT

1. Speakers - (pgs. 92 - 94)
2. Overdriven - (Demo 9 volt battery)
3. Horns - (pg. 97)
4. Specifications - (Handout)
5. Show examples - Force 12 - JBL 15" - Horn - Tweeter
6. EAW Specifications - (Handout)

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J. System Set-up

1. Stage Plots - (*Handouts*)
2. System Interconnection:
 - Proper GAIN structure
 - Proper polarity
 - Proper Impedance matching
 - Balanced vs. Unbalanced
 - Line level vs. Mic level
 - Adapters - show case
3. Class System - (*Handouts*)
4. Proper power up sequence
5. EQ and Spectrum Analysis
6. Feedback control

LAB: Set-up class system and play with crossover and biamped speakers

K. System Troubleshooting

1. Discuss technique
2. Test Equipment Demo
3. Discuss Charts

LAB: Soldering practice - use jig

LAB: De-bug System

L. System Operation - *Section #2*

1. Setting gain structure - (*Handouts*)
2. Sound check
 - PPT List

M. FINAL EXAM - "*Live Gig*"

HANDOUTS:

The Essence of Sound Reinforcement Article
 Glossary / Appendix
 What is Sound
 db Charts
 Connector Overheads
 Crown Specs
 Patchbay sheet
 KKH Class System Diagrams
 Mic Data Sheets
 Mixer Usage
 Mixer Block Diagrams

Digital Mixer Info
 Soundcraft and Spirit Mixer Info.
 Crossover Info
 BSS Info
 Rane Tech Note 128
 Line Loss and Wire Size Nomograph Sheets
 Speaker Specifications
 Stage Plot