



BOSCH

INTRODUCTION TO PUBLIC ADDRESS & ACOUSTICS

181208

by Michael Pun

1. BASIC ACOUSTICS

- a. transmission of sound through space
- b. the audio frequency spectrum for the human ear
- c. sound pressure levels
- d. intelligibility – STI and ALC
- e. aural perception
- f. room acoustics
- g. open spaces

2. COMPONENTS OF A BASIC P.A. SYSTEM

- a. Microphone
- b. Amplifier
- c. Loudspeaker

3. THE MICROPHONE

- a. the microphone as a transducer
- b. types of microphones – handheld, desk, gooseneck, lavalier, headworn
- c. types of microphone elements – dynamic or condenser
- d. phantom power
- e. polar characteristics – unidirectional, bidirectional, omnidirectional, cardioid, hypercardioid, supercardioid
- f. wireless microphones – UHF, diversity, handheld / lapel / headworn
- g. microphone cables and connectors – XLR / Cannon, DIN, 6.3mm Phone Jack,
- h. balanced & unbalanced
- i. location/placement/orientation of microphones
- j. conference microphone / conference systems

4. THE AMPLIFIER

- a. mixing amplifier, inputs/outputs
- b. preamplifier and power amplifier, inputs/outputs
- c. sensitivity 1mV vs 200mV
- d. power ratings
- e. frequency response
- f. phantom power
- g. tone controls
- h. chimes and priority
- i. impedance matching, inputs/outputs
- j. insertion
- k. emergency inputs / VOX
- l. speaker zones
- m. connectors : XLR/Cannon, DIN, Phone Jack, RCA (cinch), screw terminal blocks
- n. the 100V Line vs 8 ohms
- o. Stereo vs Mono
- p. maximizing the performance of an amplifier
- q. the voice alarm system with prerecorded announcements
- r. the induction loop amplifier for hard of hearing

p.t.o. /2

5. THE LOUDSPEAKER

- a. the loudspeaker as a transducer
- b. types of loudspeakers for P.A. – ceiling, wallbox, sound projectors, bidirectional, horns, sound columns, hemispheres, woofers and tweeters.
- c. the case for 100V Line
- d. maximum power vs rated power
- e. SPL
- f. frequency response
- g. opening angle, on axis and off axis
- h. ceiling speaker
- i. modular ceiling speaker
- j. wallmount speaker and bidirectional wallmount speaker
- k. sound projector and bidirectional sound projector
- l. pendant speaker
- m. horn speaker
- n. industrial horn speaker
- o. sound column
- p. steerable sound column
- q. prosound speaker
- r. hemispheres
- s. fire compliant speakers
- t. speaker phasing

6. SYSTEM DESIGN

- a. customer briefing, e.g. basic requirements, audience, mics, zones, etc
- b. determine the application, e.g. schools, supermarkets, factories, warehouses, etc
- c. site survey with a floor plan, e.g. dimensions, distances, indoor/outdoor, etc.
- d. select the components carefully, e.g. do we need more than mic/amp/spkr ?
- e. do the calculations – Bosch CSP Design Software. Use it.
- f. problem solving with sound processors, e.g. feedback suppressor
- g. optimize the price / performance ratio. Outdo your competitors.
- h. offer customers the best value for money. Best reason for winning an order.
- i. Happy Customer Fast Payment !

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