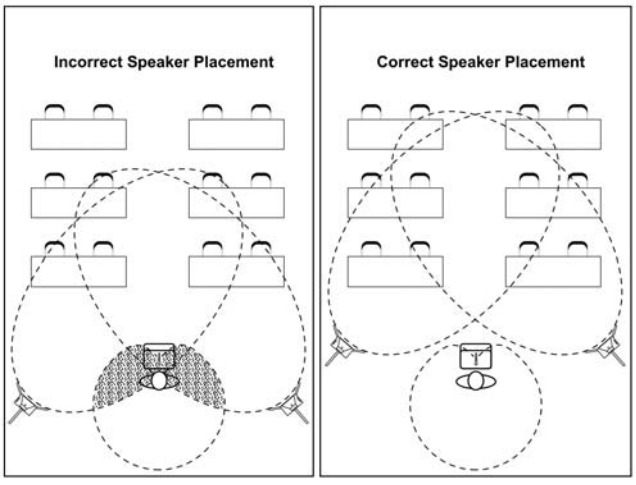
FREEMAN

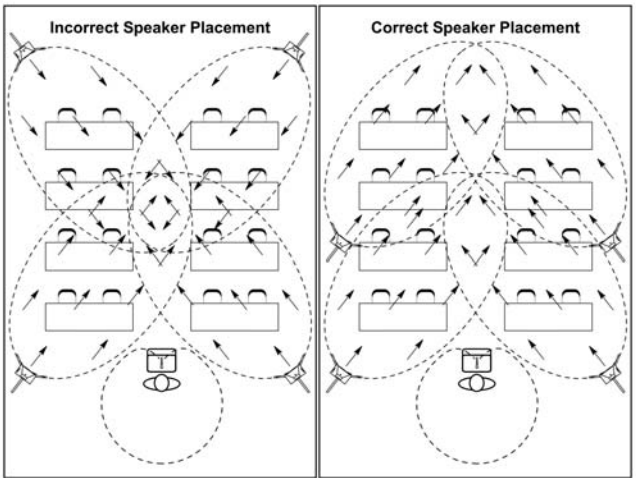
AUDIO VISUAL OPERATIONS STANDARD

MEETING ROOM SPEAKER PLACEMENT & SETUP

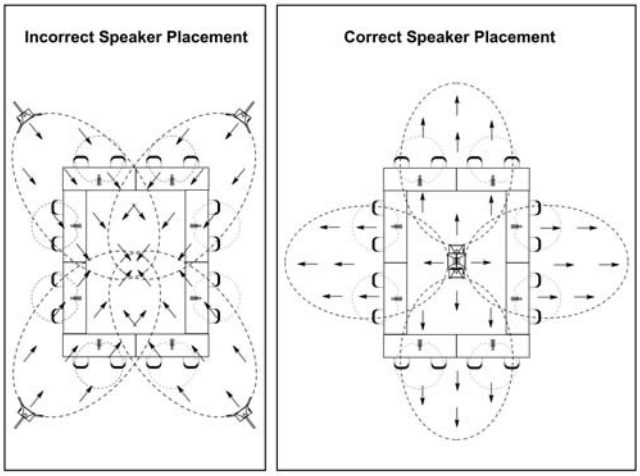
Placing Speakers in Theater/Classroom Setup

- ***Speakers must be placed in front of and facing away from the stage/presentation area and/or microphones.***
- ***Speakers are best placed in the front of and facing the intended audience area. If necessary, to prevent sightline blockage, place speakers towards sides of room facing in slightly toward audience.***
- ***Unless specified by the client/order, systems should be run in mono.*** Technicians may find a more efficient audio signal and physical setup if run at 4Ω impedance with one "homerun" to amplifier and speakers connected together in parallel *(see Speaker Impedance section, below)*.
- ***In long rooms requiring additional speakers for even audience area coverage, speakers must be placed facing the same direction as the main speakers. Never set speakers facing each other.***





Placing Speakers in Large Hollow-Square Setup



- ***Multiple speakers (4) are best placed inside the square facing toward each side of the square.***
- ***System requires at least 2 amplified speaker circuits, with 2 of the 4 speakers connected in parallel to each circuit.*** Technicians may choose to operate system in stereo or use subgroup outs in order to create zones whose volume can be adjusted appropriately depending on position of presenter/corresponding microphone.

General Speaker Setup Principles

- ***Speaker Impedance***
  - ***This chart*** (right) ***details speaker circuit impedance based on the number of 8Ω speakers connected in parallel to one amplified circuit (i.e. one side of a 2-channel amplifier).***
  - ***Low-end speaker systems should never be connected with more than 2 speakers on a single speaker circuit (run under 4Ω) to prevent potential damage to speakers or amps.***

Number of Speakers	Speaker Circuit Total Impedance (in Ω)
1	8
2	4
3	2.667
4	2

- ***Coverage angles:***
  - ***Speakers should generally be pointed toward the audience, with the center of the high frequency driver/horn aimed at the center of the intended audience area.*** Speakers setup at the outside of a room, nearest the walls, should be turned in toward the seating area slightly.
    - **NOTE:** Very wide rooms may require additional speakers to avoid a sound gap in the front center of the audience (*i.e.* front fills).
- ***Reverberation:***
  - ***Amplified sound should be focused away from hard or reflective surfaces and toward the audience area.*** Angling the speakers in such a way that they do not face a wall at 90° angles (including the back wall) will limit reverberation, slapback, and the creation of deadspots due to phase cancellation.
    - **NOTE:** Sound quality and reverberation noted in an empty "live" room will likely change once an audience fills the room.
- ***Speaker Aesthetics:***
  - ***Speaker cables must be dressed in such a way that they are invisible to the audience as much as possible.*** Small rings of electrical or Gaffer's tape may be used to secure cables to the backside of a speaker stand mast to hide them from audience view, with excess cable neatly coiled directly beneath the stand *(see pictures above, right)*. The use of Velcro cable wraps should be avoided as they draw unnecessary attention to stands.