FREEMAN

AUDIO VISUAL OPERATIONS STANDARD

MICROPHONE PLACEMENT

General Rules

- ***Maximum microphone gain before feedback is always desired.*** The following principles should be observed and followed in order to best achieve maximum gain before feedback:
    - ***Microphone should be as close as possible to its sound source until negative characteristics (noted below) begin to be manifested.*** Halving the distance from the microphone to its sound source will net a 6 dB SPL increase in gain (inverse square law).
        - *Example:* SPL with mic 2' from sound source = 90 dB. At 1' = 96 dB. At 3' = 87 dB.
    - ***No two live microphones should be any closer to each other than three times the distance of the first microphone to the sound source*** (3-to-1 rule). Comb filtering and possibly feedback may occur at smaller distances.
        - *Example:* If distance from Mic 1 to source = 2', distance between Mic 1 and Mic 2 should be no closer than 6'. Moving Mic 1 closer to source will allow a decreased distance between Mic 1 and Mic 2.
        - **NOTE:** Technicians should be especially aware of this rule when operating for a panel discussion or meeting with multiple "live" table or lavaliere mics in close proximity to each other.
    - Unidirectional (cardioid, super- / hyper-) mics placed closer than 3 inches to its sound source may over-reinforce bass frequencies to the detriment of mids and highs (proximity effect) and cause certain consonants to "pop" ('p', 'b', 't'). Technicians should encourage speakers not to "eat the mic."
        - *EXCEPTION:* Proximity effect may be desired or controlled much more easily when miking instruments (drums, amps, acoustic instruments, etc.) or vocalists.
    - Condenser mics are more sensitive across a wider range of the audible frequency spectrum than are dynamic microphones, and thus will be more susceptible to feedback.
- ***Technicians must be aware of the directional patterns of the microphones being used (omni, cardioid, hyper-/super-cardioid), as the best sound will always be produced when the microphone is directly facing and on-axis with the source.***
- ***The use of windscreens should be considered when using a microphone as they help to alleviate distortion caused by wind, breathing, the stressing of certain sounds (i,e, hard 'P' and 'S' sounds). Windscreens should always be attached when using small-capsule mics.***

Handheld Microphone Placement (*i.e.* Shure SM58)

Handheld or Fixed Microphone Placement

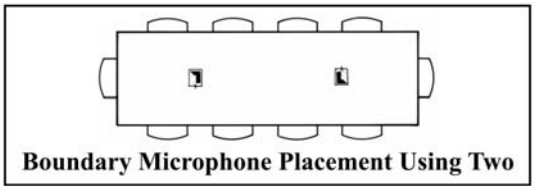
- ***Under normal conditions, a handheld microphone should be placed 6” to 12” from the speaker’s mouth at a 45° angle or less to the speaker’s mouth.***
    - Less than 6” = overemphasized bass. Greater than 12” = reduced gain before feedback.
- ***If two microphones are being used together, their elements must be placed as close to and as parallel to each other as possible.***

Lavalier Microphone Placement (*i.e.* Shure WL185)


Lavalier Microphone Placement

- ***Lavalier microphones should be connected to a tie or lapel at about the chest pocket level (or mid-breastbone).***
    - If the mic is too high, throat and breathing noise will picked up.
    - If the mic is too low, it will result in reduced gain before feedback.
- ***If the mic must be positioned to one side or the other, it must be placed on the side that the individual will be facing or turning his/her head toward most often.***
- ***Technicians must beware of placing the microphone element beneath more then one layer of clothing, or where clothing (i.e. suit jacket) or jewelry may rub against the element.***
- ***The mic cable should be hidden as much as possible, especially if speaker is being video recorded or if on IMAG.***
    - If a belt pack is attached to the microphone element, the cable can be ran inside a shirt, blouse, or jacket with the belt pack placed near the hip or lower back.
    - If speaker is wearing a shirt with no buttons and/or high neckline (*i.e.* T-shirt, crew-neck, turtle-neck), mic should be run inside shirt and emerge through and clipped to the neckline, directly below the cheek, pointing toward the speaker’s chin.

Boundary Microphone Placement (*i.e.* Crown PZM/PCC, Shure SM91)


Boundary Microphone Placement Using Two

- ***Microphone should be placed on a smooth, flat surface such as a desk or table at least 3’ square.***
    - If table vibrations are a problem, a thin piece of soft rubber may be placed underneath the mic.
- ***Microphones should be placed an equal distance from each speaker.***

Lectern Microphone Placement

- (See *AV Standard 0017 – General Session Lectern Microphone Placement* for more detail)
- ***If using a handheld mic (i.e. Shure SM58) and the lectern contains a threaded flange attached to lectern surface, a 6” to 12” gooseneck should be attached prior to connecting mic clip to bring microphone closer to speaker’s mouth. If using a lectern condenser (i.e. Shure MX412), mic clip should be attached directly to threaded flange.***
- ***If no lectern flange is available, the placement of a table-top mic stand should be used and placed on the right-hand side of lectern to leave room for presenter materials.***
- ***Cables should be neatly and inconspicuously dressed to base of lectern.***
- ***Microphone should be able to be vertically adjusted to rest 6” to 12” away from and just below the chin of a range of presenters of varying heights.***