



# OPTIMIZING THE SOUND OF YOUR INSTRUMENT OR VOICE OVER ZOOM

PEABODY LUNCH AND LEARN SERIES

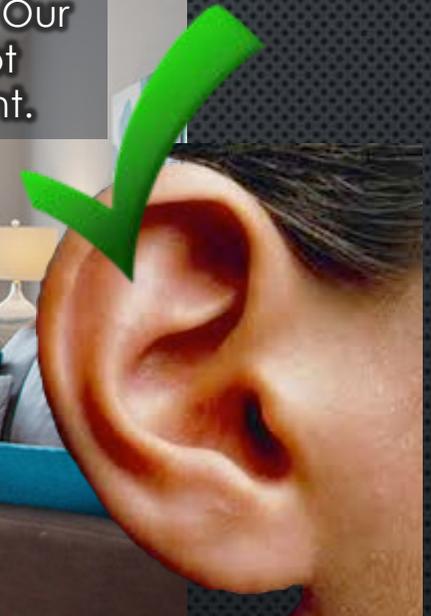
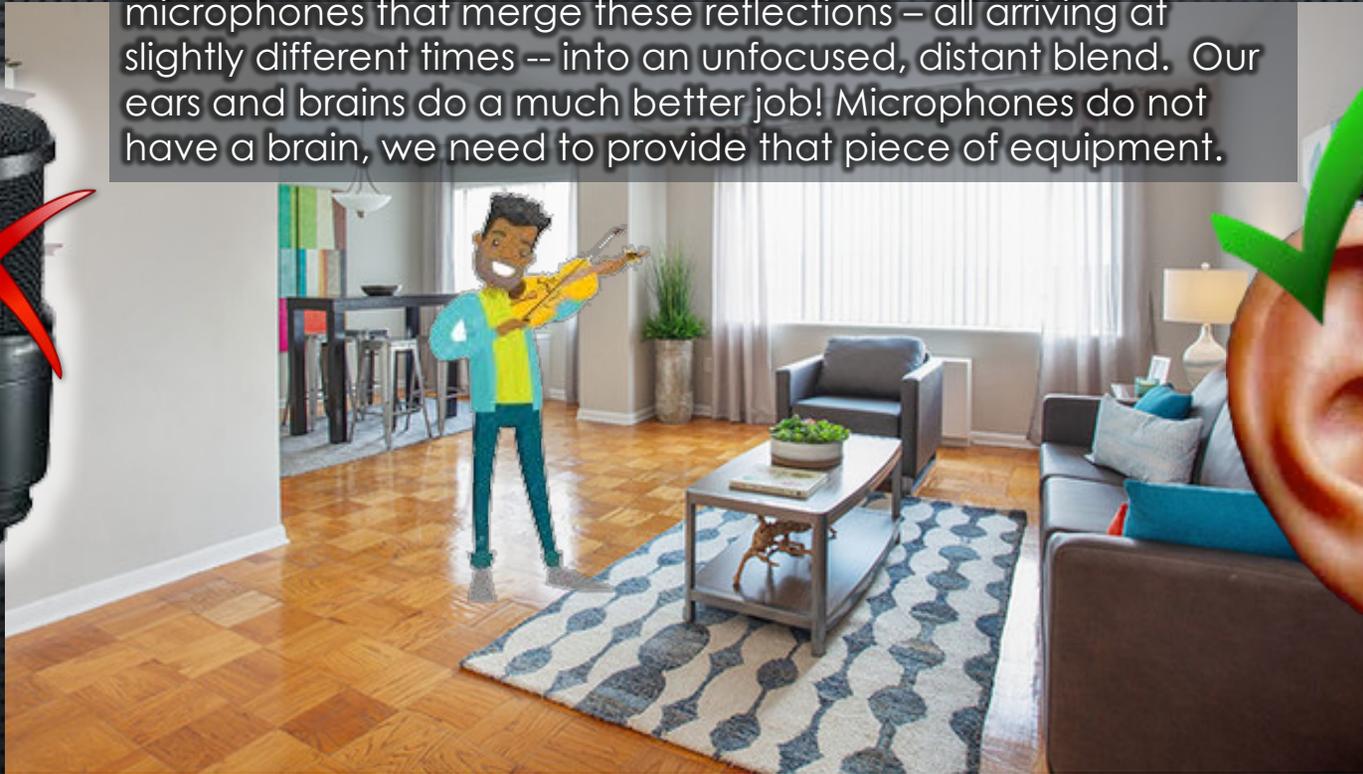
PROFESSOR SCOTT B. METCALFE

DIR. RECORDING ARTS AND SCIENCES | CHAIR, MUSIC ENGINEERING AND TECHNOLOGY



©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.

A small room with many hard surfaces (ceiling, floor, walls, windows) can sound good to the ear but are problematic for microphones that merge these reflections – all arriving at slightly different times -- into an unfocused, distant blend. Our ears and brains do a much better job! Microphones do not have a brain, we need to provide that piece of equipment.



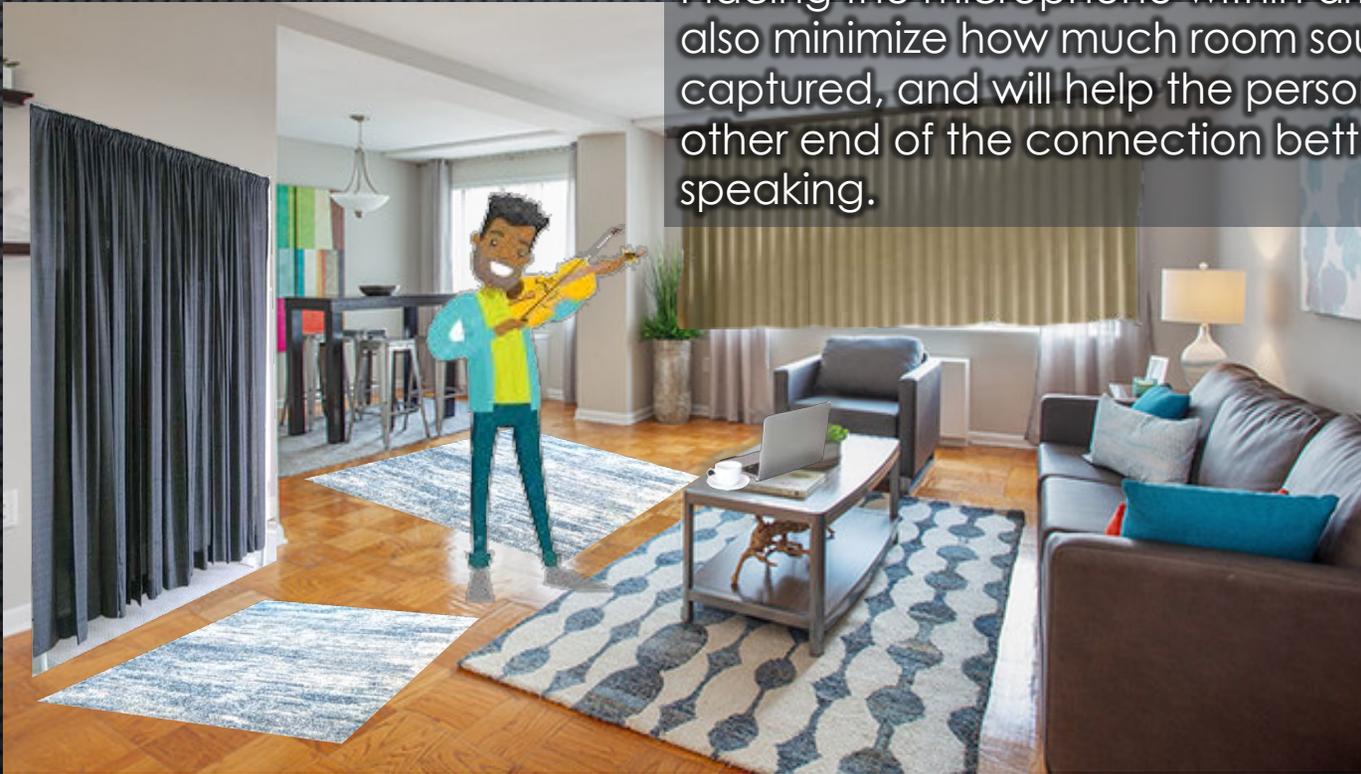


Add soft materials to cover as many of these surfaces as you can – area rugs (a pad underneath helps even more!), heavier curtains that allow little to no light through, blankets over a chair or music stand to block a wall reflection, etc.

*Tip: Inexpensive moving blankets may not look great but can be an effective sound absorber.*

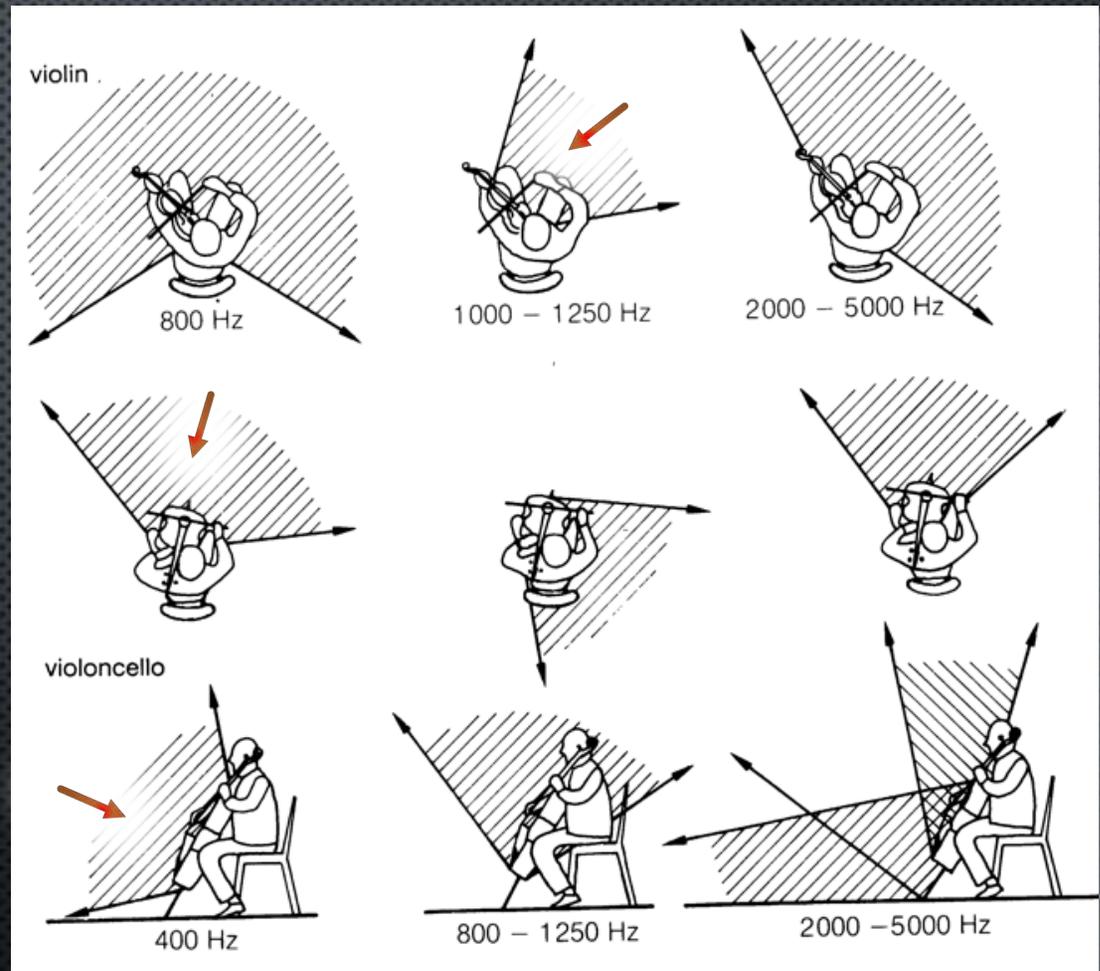


Placing the microphone within arm-reach will also minimize how much room sound is captured, and will help the person on the other end of the connection better hear you speaking.



Experiment with placing the microphone in a spot that best represents the timbre you are trying to capture. Moving the microphone just a few inches can make a noticeable change.

String Instruments tend to sound best with a microphone placed perpendicular to the instrument's soundboard.

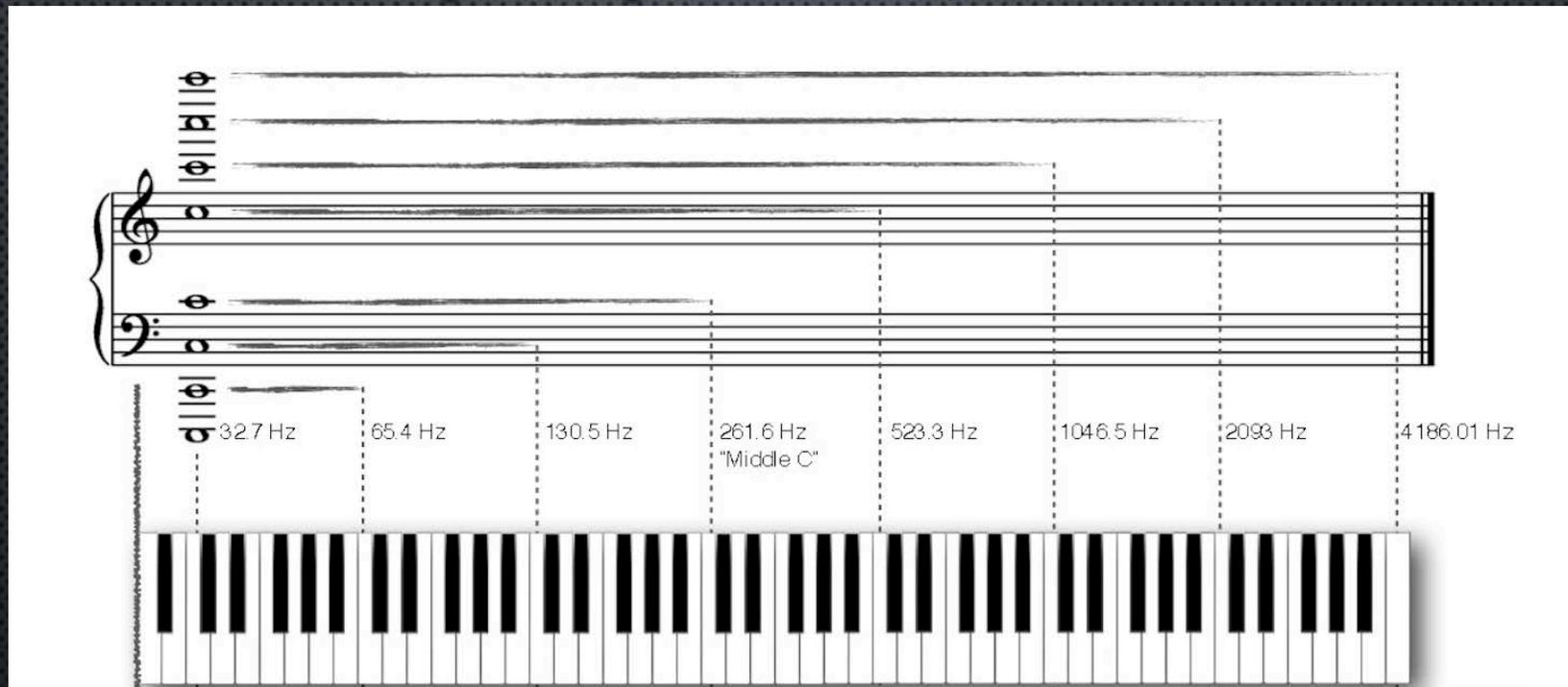


Dickreiter, Michael. *Tonmeister technology : recording environment, sound sources, microphone techniques*. New York: Temmer Enterprises, 1989.

©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.



# Frequency to Music Translator

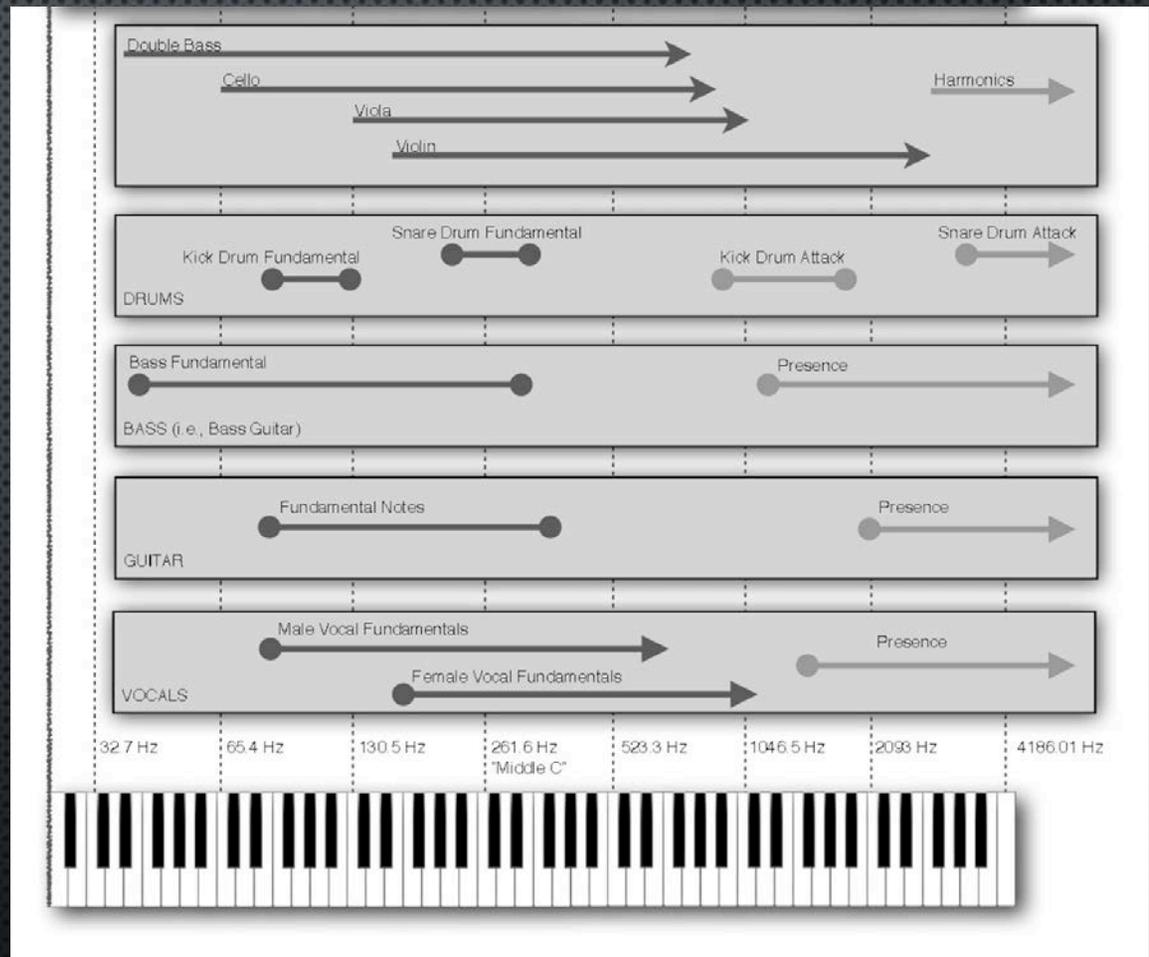


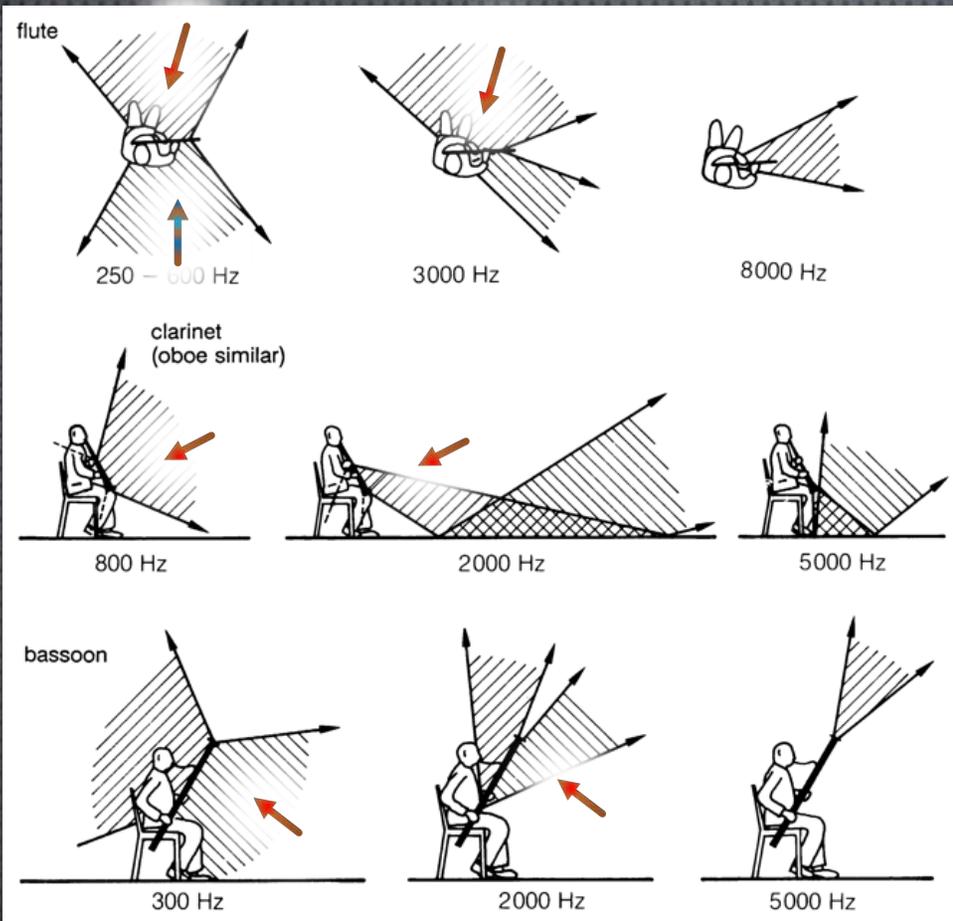
## Reference Chart



# Frequency to Music Translator

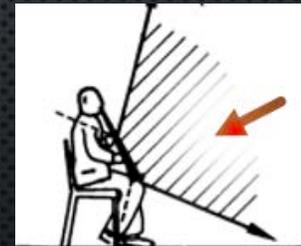
## Reference Chart





## Woodwind Instruments:

- Oboes and Clarinets tend to sound best with a microphone placed perpendicular to the instrument with the microphone somewhere in the lower third



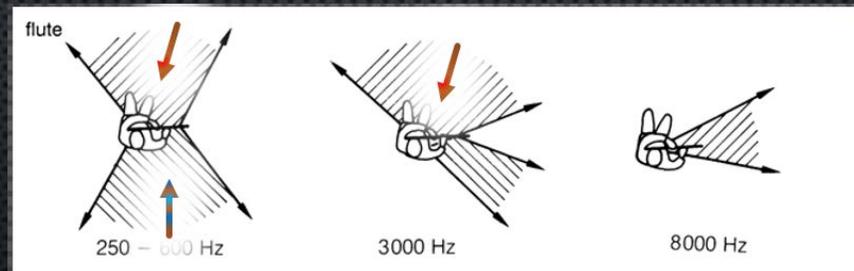
Dickreiter, Michael. *Tonmeister technology : recording environment, sound sources, microphone techniques*. New York: Temmer Enterprises, 1989.

©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.



## Woodwind Instruments:

- Flutes tend to sound best with a microphone placed perpendicular to the instrument, aimed between the mouthpiece and the hands



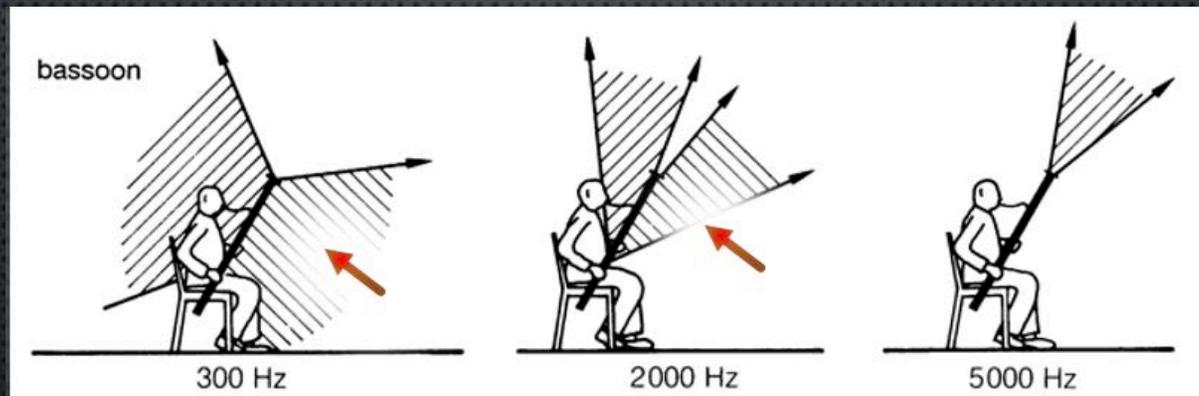
Dickreiter, Michael. *Tonmeister technology : recording environment, sound sources, microphone techniques*. New York: Temmer Enterprises, 1989.

©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.



## Woodwind Instruments:

- Bassoons near the upper-third



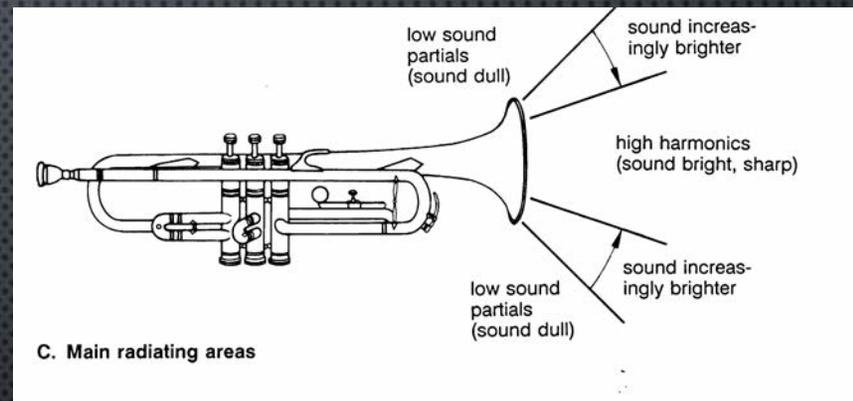
Dickreiter, Michael. *Tonmeister technology : recording environment, sound sources, microphone techniques*. New York: Temmer Enterprises, 1989.

©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.



## Brass Instruments:

- Trumpets and Trombones tend to be more straight-forward (so to speak!). See chart to the right:

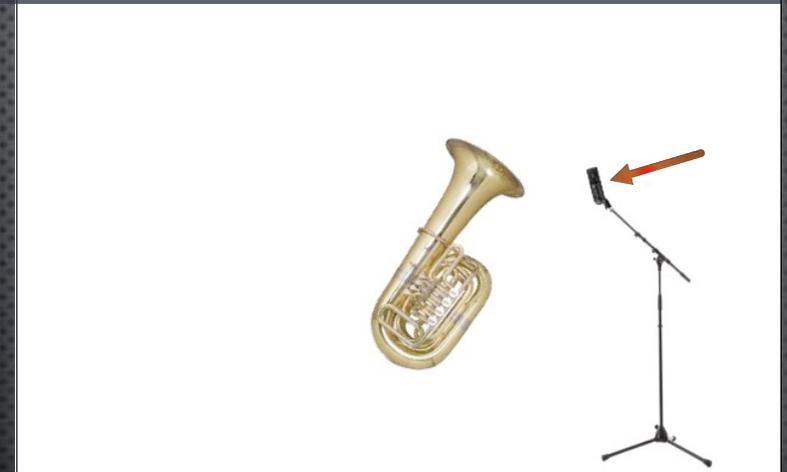
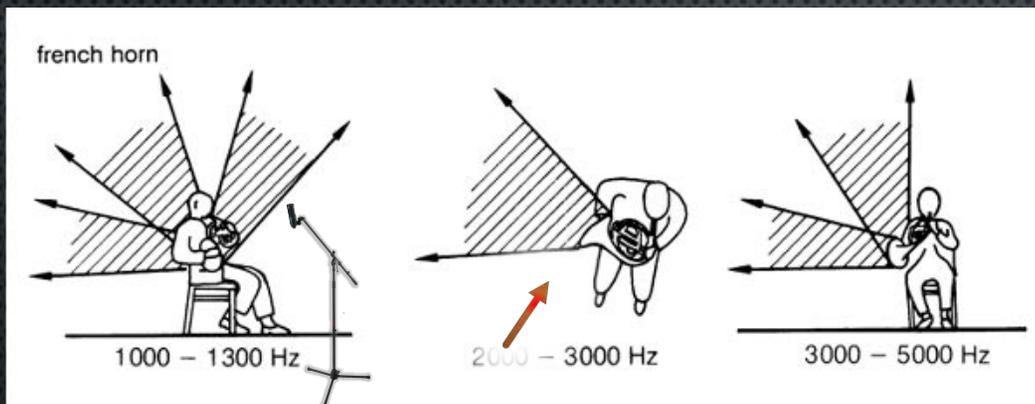


Dickreiter, Michael. Tonmeister technology : recording environment, sound sources, microphone techniques. New York: Temmer Enterprises, 1989.



## Brass Instruments:

- French Horn and Tuba present challenges in a small room since their direct sound is not the desired sound, but not catching some of it makes for a very unfocused, distant quality. Experiment with placements that catch just a *little* direct sound from the edge of the bell.



Dickreiter, Michael. *Tonmeister technology : recording environment, sound sources, microphone techniques*. New York: Temmer Enterprises, 1989.





### Vocals:

- Best about an arms-length away
- Keep microphone in a position where it can “see” the mouth, not blocked by handheld music or a music stand

Copyright © BestVector \* <http://RetroClipart.co/2137>

©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.





In general, “Large Diaphragm” microphones (also called “side-address”) work better at close distances, like within an arms-reach.



An interface (left) is necessary when using a conventional mic that has a standard XLR cable/connector

USB microphones (above) have a built-in interface; no need for anything external, connect directly to your computer or mobile device



Great resource for  
microphone placement  
ideas



#### HOW TO MIC A GRAND PIANO

A concert grand piano is among the largest and most versatile acoustical instruments in the world. Capturing the natural timbre and the full dynamics of an instrument of these proportions requires both skill and quality recording equipment.

[Learn more >](#)



APPLICATION GUIDE

#### HOW TO MIC THE GU ZHENG (CHINESE LAP HARP)

One overhead microphone is able to pick up the impressive timbre and dynamics of the chinese harp. Using a pair of overheads tends to reproduce the instrument with too wide an image.

[Learn more >](#)



APPLICATION GUIDE

#### HOW TO MIC A HARP

The harp, like the grand piano, is a challenging instrument to record. Its sound field is complex and can only truthfully be picked up if you are at least 2 to 3 meters away from the instrument.

[Learn more >](#)



APPLICATION GUIDE

#### HOW TO MIC AN OBOE

Close- or spot-miking an oboe is very similar to that of the soprano saxophone, bassoon and clarinet: Aim the mic at the fingering holes, 1/3 of the length up from the bell, at a distance of 15-20 cm.

[Learn more >](#)

<https://www.dpamicrophones.com/mic-university>



©2020 Professor Scott B. Metcalfe. All Rights Reserved. Used by Permission.



# CONCLUSIONS...

- Small rooms that sound good to your ears can be challenging for microphones due to early reflections that confuse the sound



# CONCLUSIONS...

- Small rooms that sound good to your ears can be challenging for microphones due to early reflections that confuse the sound.
- Adding soft materials to the room will help attenuate the problematic early reflections



# CONCLUSIONS...

- Small rooms that sound good to your ears can be challenging for microphones due to early reflections that confuse the sound
- Adding soft materials to the room will help attenuate the problematic early reflections
- Experiment with microphone positioning for optimal instrument or vocal sound



# CONCLUSIONS...

- Small rooms that sound good to your ears can be challenging for microphones due to early reflections that confuse the sound
- Adding soft materials to the room will help attenuate the problematic early reflections
- Experiment with microphone positioning for optimal instrument or vocal sound
- Use earphones when using “High Fidelity Mode” in Zoom or with other web video tools that disable sound optimization (run cable down your back if it interferes with instrument)



# CONCLUSIONS...

- Small rooms that sound good to your ears can be challenging for microphones due to early reflections that confuse the sound
- Adding soft materials to the room will help attenuate the problematic early reflections
- Experiment with microphone positioning for optimal instrument or vocal sound
- Use earphones when using “High Fidelity Mode” in Zoom or with other web video tools that disable sound optimization (run cable down your back if it interferes with instrument)

