

# MIC TECHNIQUES FOR ONLINE INSTRUCTORS

Presented by

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- ▶ **How to achieve better audio for online as well as hybrid teaching**
- ▶ **Selecting a good microphone for the instructor**
- ▶ **Including audio from face-to-face students**
- ▶ **Connecting external mics to your computer**

## TOPICS FOR THIS PRESENTATION

- ▶ Online presentations can readily tire the viewer
- ▶ Poor audio will distract and distance the audience
- ▶ Laptop built-in mics suck unless you remain very close
- ▶ Yet you should not hide behind your laptop
- ▶ If teaching hybrid with students in the room as well as online, you should be animate

## WHAT YOUR STUDENTS SEE AND HEAR



- ▶ Crisp, clear, authoritative audio with minimal room presence (echo, reverb, bg noise)
- ▶ Dress as you would for the classroom
- ▶ When visible on camera, don't let the microphone hardware become a distraction.
- ▶ Your audience wants to see YOU, not your podcasting setup.



## SOUND AND LOOK LIKE A PROFESSIONAL

- ▶ Headphones are great for the audience, but not for the presenter
- ▶ Headset mics are ok for sportscasters, but look awkward on professors.
- ▶ Facial masks, worn for hybrid classes, are cumbersome enough without headphones or headset mics



# DON'T LOOK LIKE DARTH VADER

- ▶ Wearing a facial mask affects your breathing
- ▶ Air is inhaled and exhaled more forcefully
- ▶ The direction and location of your exhale is modified by your mask and how it is worn
- ▶ Headworn mics may be subject to repetitive breath pops and physical contact with your mask (rubbing noise and hits).



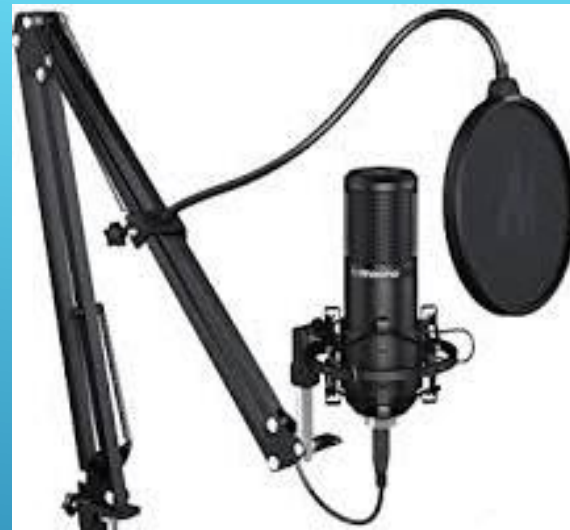
## DON'T SOUND LIKE DARTH VADER

- ▶ **Radio and Podcasting Mics**
- ▶ **Lavalier (body worn) Mics**
- ▶ **“Audience” Mics if teaching hybrid with students in the classroom**



## SELECTING A MICROPHONE

- ▶ Provides the highest audio quality
- ▶ But forces you to remain closely seated in front of the mic
- ▶ No opportunity to move around, push your seat back, stand, or do much gesturing & demonstration.
- ▶ You become a **voice** but not a person
- ▶ Visually boring
- ▶ Audience tends to focus more on your hardware rig than your facial expressions



## RADIO AND PODCASTING MICS



- ▶ Provides good audio quality and voice presence, if unmasked
- ▶ Freedom to move around, push your seat back, stand, or gesture & demonstrate
- ▶ Can be **visually busy** if worn with a facial mask.
- ▶ **Breath noise** may be exaggerated
- ▶ Physically awkward since everything mounts to your earlobes



## HEADWORN OR HEADSET “LIP MICS”

- ▶ Less affected by facial masks
- ▶ Visually inconspicuous or invisible
- ▶ Freedom to move around, push your seat back, stand, or gesture & demonstrate
- ▶ Can be wired or wireless into your computer
- ▶ Wireless systems provide more freedom, but are more expensive



## LAVALIERS

- ▶ Omni or Cardioid
- ▶ Connector type
- ▶ Voice quality



## CHOOSING A LAVALIER

- ▶ **Cardioid** is directional
- ▶ Should be aimed towards mouth, usually mounted on tie bar mounted center chest or lapel.
- ▶ Best with “formal” wardrobe that does not shift w body movement
- ▶ Often more susceptible to wind noise



## OMNI OR CARDIOID

- ▶ **Omni** hears from any angle
- ▶ Mounting orientation and loose clothing shift does not matter
- ▶ Can be rigged on anything near the face, including eyeglasses, hats
- ▶ Suitable for hiding under clothing
- ▶ Can be inverted to reduce breath pops

OMNI OR CARDIOID



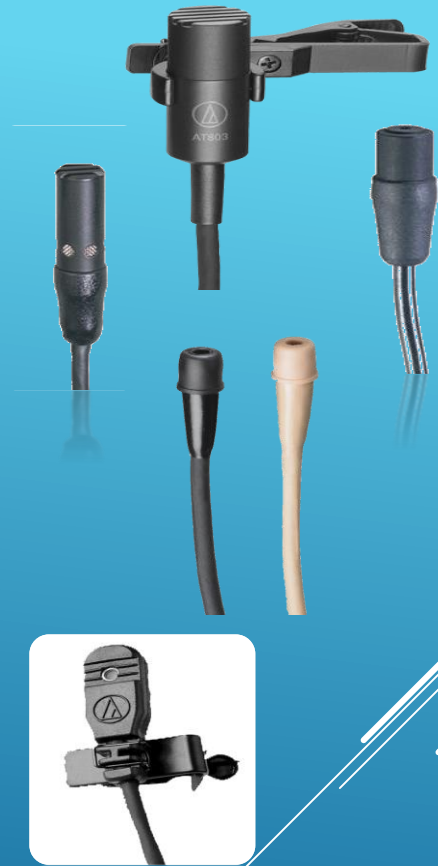
- ▶ Prosumer models usually have **3.5mm stereo** or **3.5mm mono**
- ▶ Professional are **XLR mono**
- ▶ Mic powering should be internal battery or external 48vPhantom (if using adapter box offering Phantom)
- ▶ Avoid prosumer 3.5mm mics that require 1-2 volt “mic power” ○ provided by consumer cameras



## CONNECTOR TYPE

- ▶ Prosumer lavs w 3.5mm... \$50-ish
- ▶ Professional XLR... \$125 to \$400
- ▶ Even cheap lavs sound better than laptop built-in mics!
- ▶ Consider using same quality lav that you would use on a broadcast shoot
- ▶ Maybe borrow a mic from the equipment room of your dept

YOU ARE A PROFESSIONAL,  
SO SOUND LIKE ONE

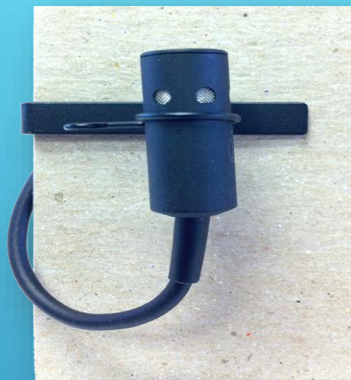


- Use a **tie-bar** or other mounting clip
- Attach mic to center opening on shirt/blouse or to necktie
- If attaching to a lapel, place mic on side talent turns to
- Alternate is to use **tape or pin mount** underneath closed front wardrobe such as pullover shirts/blouses.



## RIGGING LAVALIER MICROPHONES – MOUNTING METHODS





- Secure mic in the clip
- Loop cable up and around into the clip
- Clip mic to clothing
- Secure cable to back side of clip between clip and clothing
- Dress remainder of cable behind talent's clothing
- Sometimes by inverting the rig, so that the “bottom” faces upward, you can reduce breath noise of an omnidirectional lav.

# RIGGING LAVALIER MICROPHONES

## BROADCAST (NEWSMAN'S) LOOP

# RIGGING LAVALIER MICROPHONES – UNDER CLOTHING

## ► Eliminating cable noise

- Form one of two loops in cable (1/2" in diameter)
- Just below mic capsule
- Tie loops in loosely in place
- Use dental floss, string or cloth tape (sticky side out)
- Acts as strain relief if cable gets pulled



# RIGGING LAVALIER MICROPHONES – UNDER CLOTHING

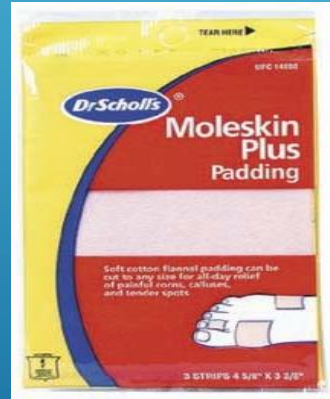
- ▶ Securing microphone capsule (**Sticky tape method**)
  - Use two small tape triangles
  - Use camera or gaffers tape, sticky side out
  - Microphone is centered in triangles
- Rig can be placed above a shirt or blouse button
- Cable loop lays opposite the button
- Tape about an inch of cable to the shirt
- Add a safety pin in the corner, for long sessions



# RIGGING LAVALIER MICROPHONES – UNDER CLOTHING

## ► Securing microphone capsule (**Moleskin/pin method**)

- Use Moleskin strips and safety pin
- Anchors weight of mic and cable
- Wrap strip around mic (sticky side IN)
- Insert open safety pin and wrap again
- Pin will hold mic securely
- Cable loop acts as strain relief to mic
- Can be used with sticky triangles to prevent clothing noise
- Secure about an inch of cable below the loop to the shirt



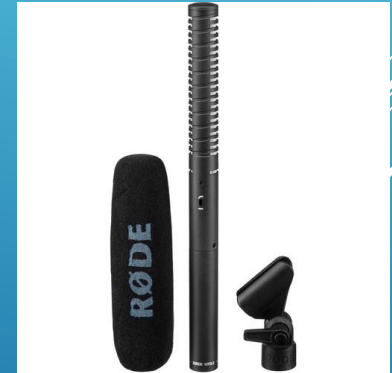
- ▶ Hybrid instruction requires being able to hear students as well as instructor
- ▶ Too many students to mic each one, plus COVID safety protocols
- ▶ Cannot have students share a conventional handheld interview mic, re COVID
- ▶ Easiest and safest to use a **shotgun mic** on a mic floor stand, so that students can remain distant or at their desks



## SHOTGUN MIC FOR HYBRID CLASSES

- ▶ Good **ENG/video shotgun mics** usually reach 6-10 feet. Usually powered by internal AA battery.
- ▶ **Condenser shotguns** are even better, but require 48vPhantom power.
- ▶ Video shotguns include Senn ME66, Audio Technica AT897, Rode, and Azden.
- ▶ True condenser shotguns include Senn MKH416 & 60/70; Audio Technica BP4073/4071
- ▶ Without using a mixing panel, there are ways to combine your lav audio and the classroom shotgun into your laptop

## SHOTGUN MIC FOR HYBRID CLASSES



- ▶ **Analog audio input:** single headphone/mic combo jack; or separate jacks for headphones and external microphone.
- ▶ **USB input:** podcasting mics equipped with USB plug, or use of XLR to USB interfaces.



## CONNECTING MICS TO YOUR LAPTOP

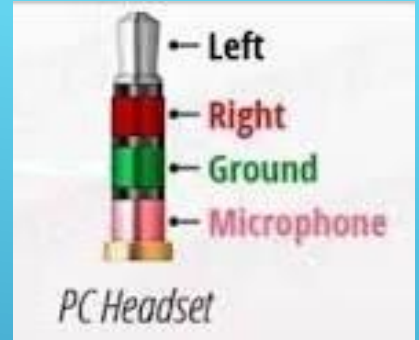
- ▶ Laptops vary by PC or MAC, and various brands & models. So you may need to experiment or at least ask someone knowledgeable
- ▶ If your laptop only has one jack that serves as both headset out and external mic in, you will need an adapter Y-cable to split out these two functions. Readily available from many sources on the internet.
- ▶ Known as **TRRS headphone mic splitter**



## ANALOG AUDIO INPUT



- ▶ The **TRRS** stands for tip, ring, ring, sleeve. This combo connector has four divided sections to provide left & right headphone out, audio in, and common ground.
- ▶ After you have split out the mic input with one of these adapters, you can plug in an external mic fitted with a 3.5mm connector.



## ANALOG AUDIO INPUT

- ▶ Even though your microphone may have a **3.5mm plug** on the end, that plug may be wired for either 3.5mm monaural (tip, ring), or 3.5mm TRS stereo (tip, ring, sleeve).
- ▶ Unless it is a stereo music mic, usually it is wired for mono applications (even if it has a TRS tip).
- ▶ Since your laptop is most likely expecting a mono signal, a **3.5mm TRS wired for stereo may not work**. You might need to slip a 3.5mm stereo-to-mono adapter over the stereo connector on your mic. Rare, but sometimes.

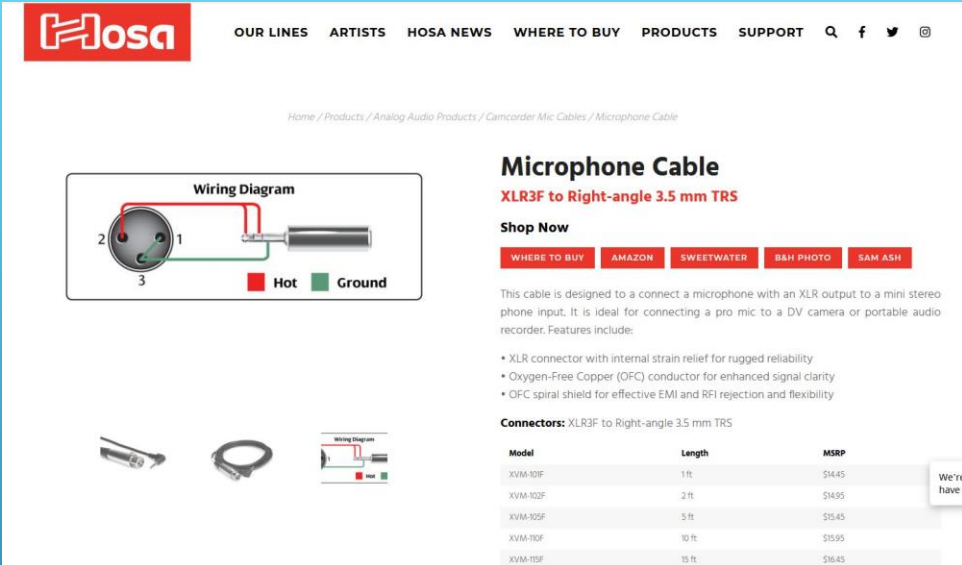


## 3.5MM MINI PLUG FORMATS



- **XLR to 3.5mm mono or TRS camcorder mono**, aka Dual Mono, such as the **HOSA XVM** series allows you to plug one professional mic into a laptop or camcorder.

## 3.5MM MINI PLUG SOLUTIONS



The screenshot shows the Hosa website's product page for a Microphone Cable. The page includes the Hosa logo, navigation links (OUR LINES, ARTISTS, HOSA NEWS, WHERE TO BUY, PRODUCTS, SUPPORT), and social media icons. The breadcrumb trail is: Home / Products / Analog Audio Products / Camcorder Mic Cables / Microphone Cable. The product title is "Microphone Cable" with the subtitle "XLR3F to Right-angle 3.5 mm TRS". A "Shop Now" button is present, along with a row of retailer links: WHERE TO BUY, AMAZON, SWEETWATER, B&H PHOTO, and SAM ASH. A description states: "This cable is designed to connect a microphone with an XLR output to a mini stereo phone input. It is ideal for connecting a pro mic to a DV camera or portable audio recorder. Features include:" followed by a bulleted list: "• XLR connector with internal strain relief for rugged reliability", "• Oxygen-Free Copper (OFC) conductor for enhanced signal clarity", and "• OFC spiral shield for effective EMI and RFI rejection and flexibility". Below this, it says "Connectors: XLR3F to Right-angle 3.5 mm TRS". A table lists the models, lengths, and MSRP:

Model	Length	MSRP
XVM-101F	1 ft.	\$14.45
XVM-102F	2 ft.	\$14.95
XVM-105F	5 ft.	\$15.45
XVM-110F	10 ft.	\$15.95
XVM-115F	15 ft.	\$16.45

A wiring diagram is shown, labeled "Wiring Diagram", illustrating the connection of the XLR pins (1, 2, 3) to the 3.5mm TRS plug (Hot, Ground). The diagram shows pin 1 connected to Ground, pin 2 connected to Hot, and pin 3 connected to Ground. A legend indicates that red represents Hot and green represents Ground. Below the diagram are images of the XLR connector, the 3.5mm TRS plug, and a small version of the wiring diagram.



- ▶ **3.5mm TRS stereo to L/R XLR** adapter cable allows you to plug two mics into your laptop.
- ▶ However, you may need to add a **3.5mm stereo to 3.5mm mono adapter** for most laptops to hear the second mic (mixed to mono)



## 3.5MM MINI PLUG SOLUTIONS FOR 2 MICS

- ▶ Another solution to plug one or two mics into your laptop is to use an **XLR-TRS adapter box intended for camcorders**
- ▶ These adapter boxes (such as from **BeachTek**) allow you to adjust/reduce the audio level of each mic; and allow you to select either stereo or mono output to your laptop (select **mono** for most laptops).
- ▶ The more expensive boxes also offer 48vPhantom mic powering.



Plus regulated  
Phantom Power



## 3.5MM MINI PLUG ADAPTER BOXES FOR CAMCORDERS

- ▶ **Presonus USB96 audiobox** provides high quality control for two microphone inputs, with 48vPhantom power.
- ▶ Also supports MIDI, 1/4 inch line outs, headphone out.
- ▶ For both PC and MAC.
- ▶ Around \$99.



## USB MIC INTERFACE BOXES

- ▶ Use an omnidirectional professional lavalier on the instructor.
- ▶ Use a good quality shotgun mic on a stand to hear the students in the classroom.
- ▶ Feed one or two mics into your laptop via an XLR-3.5mm adapter cable, camcorder box, or USB box.



## SUMMARY





- ▶ Feel free to contact me with questions
- ▶ **Fred Ginsburg CAS**  
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THANK YOU FOR ATTENDING