



UNDERSTANDING MICROPHONES

**Choosing the Right Mic for Broadcast,
Podcasting & Live Production**

A GUIDE FROM THE AUDIOVISUAL AND INTEGRATED EXPERIENCE ASSOCIATION (AVIXA®)



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Introduction

Microphones are foundational to every production environment—broadcast studios, live sound, streaming rigs, and podcasts. With dozens of designs, polar patterns, and connectivity options, selecting the right mic can feel overwhelming. This guide distills the essentials for broadcast AV professionals: how major microphone types work, the pros and cons of each, and where they fit best across studio, field, and hybrid workflows.



What You'll Learn

- ✓ How major Microphone Types Work
- ✓ Pros and Cons of Microphone Types
- ✓ Use Cases
- ✓ Best Practices
- ✓ How to Care for Your Microphone



Why Microphone Choice Matters in Broadcast AV

Microphone choice directly influences intelligibility, noise control, and the perception of production quality. In broadcast and corporate studio contexts, the right mic minimizes room reflections, limits feedback risks, and reduces the need for heavy post-processing. Quality gear also streamlines recording, helps talent feel confident, and creates a more consistent signal path across hosts, guests, and locations. If monetization or sponsor-read clarity matters, mic selection and technique can be the difference between “acceptable” and “broadcast-ready.”

As your needs grow, you can scale from simple USB setups to XLR-based chains with interfaces, mixers, and outboard tools that offer better gain structure, routing, and redundancy.

The Big Three: Dynamic, Condenser & Ribbon Microphones



DYNAMIC MICROPHONES

How they work: moving-coil dynamics convert sound to electrical energy via electromagnetic induction. When the diaphragm moves, a coil in a magnetic field generates current. This simple, rugged design excels with high sound pressure levels (SPL) and resists humidity and temperature swings.

Strengths: exceptional durability, low self-noise, and strong rejection of ambient sound compared to more sensitive designs. They are less likely to distort on loud sources and do not require phantom power. These attributes make dynamics ideal for handheld broadcast use, stage vocals, drums, guitar amplifiers, and noisy rooms.

Considerations: dynamics often require more gain from the preamp to achieve strong levels; with budget interfaces this can expose preamp noise. Some users add a mic activator/inline preamp to raise level cleanly. Dynamics may capture less “air” and high-end detail than condensers, which can be a tradeoff in pristine studio environments.

- **Best for:** loud environments, untreated rooms, handheld use, PA-driven stages, ENG stand-ups
- **Common polar patterns:** cardioid, supercardioid
- **Examples:** Shure SM58, Shure SM7B/SM7dB, Sennheiser e835, Electro-Voice RE20/RE320, Heil PR 40



Condenser Microphones

Condenser (capacitor) microphones use electrostatic principles and require external power—typically +48V phantom—to maintain the capsule charge and power internal electronics. Their high sensitivity and extended frequency response capture nuance, transient detail, and high-frequency “air,” which is why they dominate in voiceover and studio vocal work.

Large-diaphragm condensers (LDC) are known for warm, present vocal tonality and lower self-noise; many offer switchable polar patterns. Small-diaphragm condensers (SDC) emphasize accuracy and speed, excelling on acoustic instruments and overheads, and in stereo techniques.

- **Best for:** treated rooms, voiceover, acoustic instruments, detailed speech capture
- **Power:** requires +48V phantom (or internal battery/USB on some models)
- **Examples:** Neumann U87 (LDC), Audio-Technica AT2020/AT2020USB+, Rode NT1 5th Gen

Ribbon Microphones

Ribbon microphones suspend a thin metal ribbon in a magnetic gap. Their natural, smooth frequency response often aligns closely with human hearing, producing lifelike, non-hyped vocals and instruments. They are typically figure-8 in pattern, which can be useful for side rejection and room capture techniques.

Many ribbon mics are used in controlled indoor environments and require careful handling. Active ribbon designs include onboard electronics and can accept phantom power; passive ribbons should never receive phantom power as it can damage the ribbon element.

- **Best for:** studio vocals, brass/strings, rooms where natural tonality is prized
- **Handling:** avoid strong air blasts; store upright; use quality windscreens
- **Examples:** Royer R-121, AEA R84



Passive ribbons can be damaged by phantom power.



Additional Microphone Types for Modern Production

USB MICROPHONES

USB mics integrate an analog-to-digital converter and sometimes a headphone jack for zero-latency monitoring. They plug straight into a computer without an external interface or mixer, making them popular for podcasting, streaming, and travel kits.

- **Best for:** solo hosts, remote guests, portable setups, entry-level workflows
- **Workflow:** plug-and-play; select mic as input in DAW/meeting app
- **Examples:** Blue Yeti, Audio-Technica ATR2500, Audio-Technica AT2020USB+

LAVALIER MICROPHONES

Also known as lapel mics, lavaliers are discreet, body-worn microphones widely used in broadcast, presentations, and on-camera interviews. Typically omnidirectional, they capture clear voice audio when clipped close to the mouth (sternum area). Wireless lav systems pair a bodypack transmitter with a camera/mixer receiver.

- **Best for:** presenters, Q&A sessions, interviews, live events or conferencing
- **Mounting tips:** hide cable loops; use tape mounts or vampire clips; mind clothing rustle
- **Examples:** Rode Lavalier GO, Sennheiser ME 2-II

Shotgun Microphones

Shotgun mics use an interference tube to create a narrow acceptance angle, capturing audio from directly in front while rejecting off-axis noise. Their reach makes them standard for film/TV, ENG, and outdoor broadcast. They are commonly boom-mounted or camera-mounted and may require phantom power depending on model.

- **Best for:** ENG, field reporting, boom work, outdoor scenes
- **Technique:** aim precisely; avoid reflective ceilings/walls; use proper wind protection
- **Examples:** Sennheiser MKH 416, Rode NTG4+

Choosing the Connection That Fits Your Workflow

USB microphones connect directly to a computer—simple, portable, and cost-effective. XLR microphones connect to interfaces, mixers, or recorders for better gain staging, routing, multiple-channel expansion, and the industry-standard durability required in broadcast. Many creators choose hybrid USB/XLR mics for flexibility as their workflows scale.

- **USB:** fastest setup; single user; minimal gear; good for guests/remote contributors
- **XLR:** higher headroom; cleaner preamps; multi-mic support; hardware processing; redundancy
- **Hybrid:** start USB; move to XLR as needs grow without replacing the mic

How to Choose the Right Microphone (Decision Framework)

Use environment, source, and workflow to guide your selection:



ROOM & NOISE

- noisy/untreated → dynamic
- quiet/treated → condenser or ribbon



MOBILITY

- presenter moving → lavalier
- fixed position camera → shotgun



DISTANCE

- need reach → shotgun
- close, intimate → dynamic or LDC condenser



CONNECTIVITY

- solo/remote → USB
- multi-mic/broadcast routing → XLR



tone

- natural/warm → ribbon
- bright/detailed → condenser
- robust/present → dynamic

PUTTING IT ALL TOGETHER

Here's an example of how you can apply these to choose the appropriate microphone:

Scenario:

A host in a noisy office wants to sound clear on camera from 6 inches away.

Decision Process:

- Noisy space → dynamic
- Close distance → dynamic
- XLR interface available → XLR dynamic
- Wants a "broadcast" tone → dynamic

Recommended mic type: Dynamic broadcast microphone



Microphones in Broadcast, Streaming & Podcasting



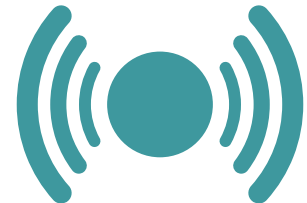
BROADCAST AV:

In studio floors and news sets, dynamic handhelds and lavaliers dominate due to noise control, handling comfort, and consistency. For desk-based hosts, broadcast dynamics (SM7B/RE20) deliver rich proximity tone with strong off-axis rejection. Field crews rely on shotguns for reach and isolation.



PODCASTING:

Beginners may use USB mics for speed; growing shows adopt XLR dynamics for better noise rejection and tone. Condensers can deliver sparkling detail in treated rooms. If interface gain is limited and you choose a low-output dynamic, consider an inline preamp to add clean gain.



STREAMING & CONTENT CREATION:

Streamers value consistent close-mic tone and rejection of room noise—dynamic mics excel here. Hybrid USB/XLR models simplify travel and upgrades. For creators recording instruments and voice, pair a small-diaphragm condenser for instruments with a dynamic for voice.

Placement, Setup & Best Practices



POSITIONING: Start 6–8 inches from the mouth at a ~45° angle to mitigate plosives. For noisy rooms, move closer (4 inches) and lower preamp gain to reduce ambient capture. Keep talent on-axis for clarity unless using slight off-axis to tame harshness.

- **Pop control:** pop filter or foam windscreen; angle slightly off-axis
- **Stability:** boom arm or shock mount to reduce handling noise and desk bumps
- **Monitoring:** closed-back headphones; check for hum, RF, plosives, sibilance
- **Interfaces:** enable +48V only for condensers/active ribbons; set gain to peak around -12 dBFS
- **Cabling:** use balanced XLR; avoid tight coils near power supplies; label channels for multi-mic sets



CONNECTING TO AN AUDIO INTERFACE:

Plug the mic's XLR into the interface. For condenser mics, enable phantom power. Connect the interface to your computer via USB/Thunderbolt, select it as your input device, and set gain so the loudest speech peaks stay below clipping. Monitor from the interface to avoid latency.



REDUCING BACKGROUND NOISE:

Add rugs, curtains, and soft furnishings or basic acoustic panels at first reflection points. Turn off noisy HVAC or relocate microphones away from noisy electronics. Keep consistent mic technique and posture to avoid level swings.



Maintenance & Care (Cleaning, Storage, Longevity)

CLEANING: Periodically remove and wash foam windscreens (per manufacturer guidance). Wipe grilles and exterior surfaces with a soft, dry cloth. Avoid liquid cleaners near capsules. For shared mics, follow hygiene protocols and allow grilles/foams to dry fully before use.

STORAGE: Unplug microphones when not in use. Store in original cases or padded pouches to guard against dust, moisture, and impacts. If a mic stays on a stand, cover it with a dust cover. Keep gear in a dry, climate-stable space.

CABLE CARE: Coil XLR cables loosely using over-under technique. Avoid tight bends and sharp wraps that can break conductors or introduce interference issues over time.

SUSTAINABILITY TIP: When gear reaches end-of-life, consider electronics recycling and donation programs. A great starting point is the AV donation network offered by [**SAVe**](#).

Conclusion & Key Takeaways

Choosing the right microphone is one of the most impactful decisions you can make in any broadcast, streaming, or podcasting workflow. We hope that this guide will help you make those decisions with confidence.

KEY TAKEAWAYS

1. Choose the mic that fits your environment.

Dynamic mics excel in noisy or untreated rooms, while condensers and ribbons shine in quiet, controlled spaces.

2. Let the use case guide your choice.

Lavaliers are ideal for presenters, shotguns for field work, and broadcast dynamics for rich, close up vocal tone.

3. Connectivity shapes your workflow.

USB mics keep things simple for solo setups, while XLR systems offer flexibility, expansion, and professional control.

4. Technique matters more than price.

Good mic placement, consistent distance, and proper gain staging will always elevate your sound.

5. Take care of your gear.

Clean windscreens, store microphones properly, and maintain cables to extend the life and reliability of your equipment.



Want to take a deeper dive?

Check out our [Podcast Equipment Pathway](#) for podcasts, videos, courses and more!

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Continue your learning with AVIXA Broadcast AV trainings, Power Hours, and webinars on microphones, audio workflows, and remote production best practices, and more.

- Recorded Webinar:
[Remote Video Control Techniques and Tools](#)
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ORIGINAL ARTICLE SOURCES

This guide was adapted from AVIXA articles by Iulia Popescu:

- Types of Microphones:
[Choosing the Right Microphone for Every Use](#)
- Ultimate Guide to Podcast Equipment and Microphones:
[Everything You Need to Know](#)
- Dynamic Microphones:
[The Ultimate Guide for Content Creators and Live Performers](#)



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