

Condenser microphone maintenance and trouble-shooting guide

This guide was written to help you better understand the way condenser microphones work, how they should be used, cleaned and stored for optimum results, reliability and longevity.

Even though the subject is richer than it might first appear, I tried to keep the style simple and easy to read, keeping “tech talk” to a minimum. That way, this guide can be read by the musician, producer, recording engineer, service engineer and be equally useful to all.

There are three main chapters:

- 1) “Introduction”: a few words on condenser microphones. Not an in depth discussion, just enough to know what they are, how they work.
- 2) “Daily use and maintenance”: what you should do, starting on the day you open the box, to make sure that your microphone will keep working properly for years.
- 3) “Trouble shooting”: deals with the old “why doesn’t my mic work?” problem.

Hopefully, this should cover everything but if not, feel free to Email us and we’ll be happy to help you.

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November 2005
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1. Introduction

The basic operating principle of the “condenser microphone” is quite simple: A condenser (capacitor) with a fixed plate and the other plate being an extremely thin and light foil acting as a diaphragm is electrically charged. The output signal is “measured” as sound is produced in front of the diaphragm: the resulting sine wave is a direct analogue of the acoustic wave. The system thus acts as a transducer, converting acoustical energy into electrical energy.

Condenser microphones became “ technically viable” in the late 1920s. The condenser microphone could finally be produced commercially and the first and prime example remains the Neumann CMV3 (1928).

Things have changed a good deal since then. There have been improvements and technological advances in electronic components quality, materials used for the condenser element, and of course decades of research and development led to vast improvements in the final specifications of the microphones. Many modern manufacturers have dedicated design teams pushing for better specifications all the time. The extremely efficient modern manufacturing methods made it possible to bring the once very expensive condenser microphone within the budget of even the most modest studio owner or home recordist.

Even if today’s condenser microphones are more sturdy and reliable than ever, some of the “classics” remain very sought after. It is true that some of those microphones were fitted with exceptional capsules, which is the heart of the condenser microphone. However, it should be kept in mind that a condenser microphone built in 1960 will most likely need to be rebuilt to achieve its original specifications. Capsule and electronics components aging can lead to anything from intermittent erratic behaviour to life threatening faults in the case of tube microphones.

This “old mic cult” has led some electronics designers to re-think some of those old favourites, and design new models based on those “vintage” mics that you’ve seen countless times on all those classic recording session photos. Those “neo classic” models are becoming quite popular and are typically trouble-free and reliable which is typically not the case of the models they emulate (unless they’ve been completely rebuilt).

And so here we are today with an incredibly large selection of microphones to choose from, whether we have a 200 dollars budget or a 2000 dollars budget. So let’s take a look at what you should and shouldn’t do to keep your mic safe and sound for yours to come.

2. Daily use and maintenance

1) Power related :

- a. Never “hot plug” or unplug a condenser microphone ESPECIALLY if it’s a tube mic. Plug in the mic THEN apply power (Phantom or dedicated HV for tube mics). Remember that you might also damage the mic preamp when you hot (un)plug. Wait a few seconds for the mic’s capacitors to discharge before unplugging after power has been turned off.
- b. Don’t change the capsule of a modular system like the AKG CMS C451, Schoeps Colette Series, Neumann KM, ADK SC series etc. while Phantom Power is on.
- c. When powering up or down or changing patterns or pad values, turn the monitors level down. Doing this will protect your speakers and your ears.
- d. If a problem appears in the middle of a session, don’t “rock” the Phantom Power switch to “see what happens”. Put the faulty mic aside and test it later.

2) Capsule related :

- a. Don’t use a condenser mic on vocals without some form of protection. Depending on the application, a foam “sock” type, a Nylon screen type or a metal screen type should be used. This will protect the capsule from plosives but also from humidity. The choice of screen/filter will also depend on the level of high frequency attenuation desired, the foam “sock” having the greatest effect (works great for taming sibilance by the way).
- b. Never use a condenser mic on heavy SPL applications where there’s important air movements without protection, see above.
- c. When not in use, store your microphone in a dry environment, preferably with active Silica Gel beads. If the mic has to be left in position overnight (ie. on a mic stand in the studio), put a bag over the head of the mic (to prevent dust accumulating on the diaphragm).

- d. If you bring your mic in a warm room from a cold place, leave it in a warm and dry environment for several minutes until all traces of condensation have disappeared. Otherwise, erratic operation might be experienced. This should not be considered a fault and happens to all condenser microphones subjected to sudden temperature and humidity differences.

3) Cleaning:

- a. The best cleaner for the body of the microphone is simply household soap or mild detergent mixed with water. Do not attempt to clean the grille because you might spill some cleaning solution on the capsule. Even a tiny drop might cause problems, possibly leading to a replacement of the capsule.
- b. It is recommended that after each use, you wipe the body and grille of the microphone with a dry, lint-free towel. Doing this regularly should keep the finish of the mic intact for years. Avoid paper towels etc because paper particles could reach the capsule through the grille.
- c. You should clean the XLR connector pins a few times a year, especially if the mic is used regularly (plugging and unplugging can soil and/or wear the pins). Any good contact cleaner and lubricant could be used. They can be found in every electronics stores. Be careful not to spray anything towards the capsule. A cotton swab will help: spray some cleaner on the cotton swab, and clean the pins with the swab.
- d. Do not open the microphone for cleaning. There are very high impedance parts inside and the PCB could be contaminated easily by finger prints.

3. Troubleshooting

In this section, we'll take a look at a few potential problems, their symptoms and the solutions.

NOTE : We will assume that your power source is functioning correctly.

- If you're using a Phantom powered mic and have a problem, please start by swapping your Phantom Power supply for another one to make sure it's not the cause of the problem. If you're using a mixing console, find an external Phantom PSU for testing because all the channels of the console are powered by the same +48V supply rail, even if you have individual Phantom switches on each channel.
- If you're using a tube mic, please swap the PSU for another one – if you don't have another one or a spare, your local ADK dealer should be able to provide one to test your mic.

1) Intermittent sound when the body/connector is touched :

- a. The XLR connector could be dirty, but first check with a different cable to find out if the cable isn't the problem. If not, then the XLR pins are either dirty, or bent. If they're dirty, please see chapter 2 : 3)cleaning:
c). If they're bent (typically due to heavy use) you can bend them slightly outwards with flat nose pliers.
- b. If none of the solutions listed above works, one of the switches could be the problem, or there could be an internal fault. Please Email us, and if a DIY solution can't be found, you'll have to return the mic for repair.

2) Intermittent sound even when the mic isn't touched :

This is most likely a capsule related issue but it could also be due to the FET or Tube. In the case of a tube mic, try changing the tube for a new, tested one. In the case of a FET mic, you will have to return the mic for repair but first, try storing the mic in a dry and warm environment for a few minutes. Humidity/condensation could again be the source of the problem.

3) Intermittent sound when breathed upon :

This is typical of a capsule failure. It can be due to a problem that occurred during manufacture (rare) or most likely, a repeated exposure to moisture, whether ambient humidity or in when use (ie. vocals without pop screen). Contamination of the capsule will also trigger this sort of behaviour. The contaminant could be anything from a fluid to a food particle. The only solution is to send the mic in to have the capsule replaced.

4) Sound, but low sensitivity, “wind noise”, “rumble noise”, “capacitor discharge noise” or all at once:

This is definitely a capsule related issue, the mic should be sent back for repair.

5) No sound at all :

Again, please check and if possible swap:

- Phantom or dedicated HV Power supply
- Cable

If your mic has no output signal with a healthy Power source and connectors/cables, it should be sent in for repair.

So there you have it. This list is not exhaustive but should help you troubleshoot many problems yourself, enabling you to go back to recording your music within minutes.

Don't hesitate to get in touch if you have a problem, but please don't send a mic in for repair without prior arrangements.

And most of all... enjoy your microphone!

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