

# Troubleshooting Audio Quality Problems

---

Audio quality can be impacted by a variety of sources, ranging from where the microphone is placed to more technical conditions. During a meeting, it is often best to simply lower the volume on the site causing the problem and take corrective action later.

If the location experiencing the problem is in a conference and the audio can still be understood despite the problem, it is best to wait until a break to correct the issue.

We have prepared a series of short audio clips for you to compare with the problem you are experiencing, and some tips on how to handle each scenario. Some of the audio samples are subtle; you may need to increase your volume or wear headphones to hear them properly.

- [Distortion](#) (loud, boomy)
- [Airflow and Breathing](#) (buffeting, fluttering)
- [Local echo](#) (like a cave)
- [Distant](#) (quiet, faint)
- [Mechanical Noise](#) (hums, whines)
- [Electrical Noise](#) (crackling, popping)
- [Packet Loss](#) (irregular chops)
- [Processing](#) (regular chops, strange effects)

## Distortion

Sample 1: Microphone placed close to the person's mouth

Sample 2: Microphone placed close to the mouth, level increased

Distortion is typically generated by a microphone positioned too close to the user, or set with sensitivity too high for the amount of sound it is receiving. Usually this is fixed by the user positioning the microphone correctly relative to their position.

- Tabletop microphones should be 2 to 2.5 feet away from the user on the table.
- Most headsets should position the microphone off to the side of the mouth or below it instead of directly in front.
- Handheld microphones are usually carried below the mouth.

It is possible for some USB microphones to produce a similar effect that is actually a [processing issue](#).

## Airflow and Breathing

Sample 1: headset microphone in-line with nose, exhaling heavily

Sample 2: Electric fan blowing across the microphone surface directly

This occurs in handheld/headset microphones when the user places the microphone close to the nose or mouth and breathes across its surface. It can also occur on other microphones located near a vent, computer fan, projector or other source of airflow.

## Local Echo

Local echo is generated by hard, flat surfaces (windows, tile floor, cinderblock/brick walls) and/or high ceilings. Sound waves bounce off the surfaces and reach the ear (and the microphone) at different strengths. This can be somewhat distracting to listen to. This can be mitigated through the use of headset microphones or handheld/lapel microphones, all of which are designed to pick up the louder volume generated by close proximity to the mouth. It is also possible to address by changing the room itself... putting in soft surfaces (curtains, carpeting, padded panels) and "breaking up" flat surfaces can do a lot to reduce/eliminate local echo. You might consider discussing your room acoustics with a specialist.

## Distance

Sample 1: USB Desktop microphone at 5 and 10 feet

Sample 2: USB Desktop microphone pointed away from the user

These sound conditions occur when a user is too distant from the microphone. The volume decreases over distance, and the person talking seems to get quieter. This is a natural effect in ceiling microphones (which usually receive sound by deflection). Some microphones are also set to capture audio in a specific direction, and sometimes in a narrow pickup pattern; if the person speaking is not in the pickup pattern, the audio the microphone receives will primarily be whatever reflects off other surfaces before reaching the microphone. NHSONE's audio controls can help compensate for the actual volume, but the person talking should be positioned within the proper pickup area for the microphone.

## Machine Noise

Sample: Microphone in close proximity to machine vent

Computer fans and HVAC are the most common sources of machine noise. Ceiling microphones can be especially susceptible, as they are often closer to vents, ducts and projectors than they are to users. Turn off unnecessary equipment when having a conference, and move microphones away from the sources of these noises.

## Electrical Noise

Sample: Electrical noise generated by mic input on SoundMAX onboard audio interface, mic gain high

This can be caused by on-board audio processors inside computers, but can occasionally be caused by faulty cabling/connections and sometimes interference from other devices that send out strong signals. Check all connections for the audio equipment; make sure there are no loose wires. Try using a different sound interface (such as a USB headset/USB microphone) to see if the problem persists.

## Network Loss

Sample: Low Bandwidth cellular connection in a moving vehicle

This is due to some device on the network between the sites dropping packets containing audio information. This is typically accompanied by video faults (pixels stuck, image blurring, etc) as well. Loss indicators on the left side of the site listing flash yellow and red when loss is present on the network. When packet loss is present, whole words and phrases can be dropped from a conversation. Close unnecessary video windows and stop sending unnecessary cameras to free up network resources. Advise the network administrator of the issue; they may need the IP address of the machine, IP address of the UCS, and ports currently in use (CTRL-ALT-V will bring up the last 2 pieces of information).

## Processing Faults

Processing faults are similar in symptoms to packet loss, but tend to have audio loss in repeated intervals instead of erratically. This can occur in the computer, the sound interface or an echo canceller (if one is present).

Sample: Faulty audio device or driver, processor over-utilized (note the "chopping" effect on the speech)

On the computer, look at its processor performance. Close open applications (especially anything that might be using the sound card). Rebooting the computer may be necessary. Cycle the power on any external audio processing equipment (disconnect the power cable, wait 10 seconds, and reconnect the power cable if no switch is present).

## Faulty USB Equipment and Connections

It is possible for USB hubs and extensions to produce insufficient power or bad signaling to USB audio devices, resulting in a variety of aberrant effects. Audio may seem to be "chipmunked", garbled or otherwise altered. Try connecting your audio devices directly to a new USB port on the computer (no hubs or extensions).

## Noise reduction (warbling, underwater effects)

Some noise-reduction features can generate a strange warbling sound in the background of your audio. Try reducing the aggressiveness of the noise reduction if possible. It may be necessary to look at other audio solutions that offer a greater range of noise-reducing options, or handheld/lapel microphones which have a lower sensitivity and pick up less environmental noise.

## Echo Cancellers

Echo cancellers will often reduce microphone levels when they aren't detecting a person speaking. Some echo cancellers handle this function more discretely than others. If a person's audio is dipping radically while they are talking, their microphone may be detecting pauses as silence and reducing their level.

NHSONE features built-in echo cancellation which can be toggled by right-clicking on the speaker icon during a meeting and selecting it from the menu. It should be disabled if you have another hardware-based echo canceller in use.