25 Improving Your Audio For the World of Virtual Communications

I'm Doug Fearn and this is My Take On Music Recording

During the Covid Pandemic, much of our normal in-person interaction has shifted to the virtual realm.

We all have had to learn about conference calls, Skype, Zoom, and other new methods of gathering and communicating. And all of these technologies rely on voice communication, at least in part.

Even broadcasting now utilizes Skype to bring in at-home reporters, commentators, and guests for news and entertainment shows.

Trade shows, conferences, committee meetings, presentations, and classes are now mostly all virtual.

And one thing I have noticed is almost universal bad audio, even from the large networks, not to mention in the work meetings and family gatherings.

But first, does it matter? Have our expectations of decent audio deteriorated to the point where no one cares anymore? Or is it just that people don't know how to improve their sound on these platforms?

I suspect that many people find bad audio annoying or frustrating but either don't know why it is bothering them, or presume there is no better way.

In my never-ending quest to improve the world of audio, I have a few simple suggestions that could make a big difference.

The one thing that people could do that would make a huge improvement right away is to stop using a speaker phone or equivalent. This technology has been around for at least 60 years and has improved somewhat in the interim, but it still suffers from a couple of fundamental limitations.

For one thing, these systems are what is called in communications jargon, Simplex. That means that you can either talk or listen, but never at the same time. When you talk, the speaker must be muted to prevent feedback, which is particularly annoying on a digital circuit because of the latency. Latency is the time delay it takes for the digital circuits to encode and decode your voice. And when the other person is speaking, you cannot be heard. And vice versa.

It's not possible to have a normal conversation with a simplex system, since the usual back and forth of conversing with a person cannot happen. This is compounded by the latency issue.

Simplex only works well if one person speaks, stops, and then listens to the other person talk. It would work better if everyone said "Over" when they were finished.

But real conversation, especially face-to-face conversation, does not work that way. We are constantly interrupting each other, not necessarily because we feel the need to stop the other person, but because we can see when someone is inspired to respond. We stop and let the other person talk.

Of course, this presumes that the two people having the conversation are decent human beings and listen as much as they talk. But that's another problem, and I do not have a solution for that one.

The other problem with the speakerphone system is that, by necessity, the microphone is going to be some significant distance from your mouth. And when that happens, we get into the ratio of the direct to reverberant sound issue. That simply means that the farther you are from the mic, the more of the room the listener will hear. That could be great if you are in an acoustically appropriate studio and the sound of the room adds richness to your voice and actually improves intelligibility.

But usually we are speaking from a random room in our house. And most domestic rooms are terrible acoustically. The excess reverberation, and the emphasis of particular mid-range frequencies due to the room dimensions, reduces intelligibility. This makes the listener work much harder to understand what you are saying.

So, avoid the speakerphone. My suggestion is to use a headset, whether you are using a phone or a computer for your communications. I use a cheap headset that cost about $40. It's not made very well, and I expected it to fail quickly, but instead of paying hundreds of dollars for a more expensive version, I just have two of them. That way I have a backup if one fails.

I have to say, however, that my oldest headset is coming up on three years old and still working perfectly.

By using a headset, the microphone can be positioned much closer to your mouth. And that reduces the sound of your lousy room.

But experiment with the mic placement. I was used to an aviation headset, where you position the noise-cancelling mic as close to your mouth as possible. Doing that with a phone or computer headset is likely to sound awful. There will be much too much breath noise. And most of those mics are directional enough to have proximity effect, so the bass will be exaggerated and that will reduce intelligibility. The phone or computer audio circuits have very limited headroom, so you are likely to overload the amplifiers and that can make your voice unintelligible.

The best way I have found to determine the best distance is to use the feature in some programs, like Zoom, to test the mic. You can record a short segment and play it back to hear how it will sound to others. For my headset, having the mic about 4 to 6 inches away and off to the side resulted in the best sound.

If you are doing a TV appearance you might not want to be seen wearing a headset, so in that case, you can use a lavalier mic and ear buds. The mic can clip to your shirt and be unobtrusive. You might even like the professional look.

Some people use the mic that is integrated in the earbud cord. This places the mic several inches away. This can sound pretty decent, but the room pickup may be excessive. And those mics are usually not the best-sounding microphone you could use.

Also, be aware that your clothing, jewelry, or hair might contact the mic and cause some strange and distracting sounds.

What about using a studio mic for this purpose? Great idea, but interfacing a professional mic with the unbalanced mic input on the phone or computer is not an easy matter. For one thing, the phone or computer will be looking for an electret condenser mic, which requires 5-volt power that is provided by the phone and will cause problems with any other type of mic.

Plus, the level and impedance are wrong. So, it is necessary to provide some interfacing circuitry. Trying to use a studio <u>condenser</u> mic will be even more complicated. And a <u>ribbon</u> mic could be endangered by the phone or computer circuitry, which may put a spike of voltage into the mic when you connect it.

But if you are willing to work out the technical details, it is entirely possible to use a studio mic. I have been on calls with people who have done this, and it sounds pretty amazing compared to what most people use.

It's important to keep in mind that what you want is a mic that is equalized to optimize the speech range. Using a close directional mic is going to reduce intelligibility unless you roll off the low-end pretty severely. And the high-end sibilance can sound pretty nasty on these systems, since the low sample rate audio will suffer from aliasing artifacts. You might have to roll off the highs as well as the lows. By that point, the advantage of the studio mic may be completely lost.

I've thought about doing this myself, and I have the background and parts to build a good interface, including the eq. But it all seemed like a lot of work for little gain.

However, it would be cool to be seen at your Zoom meeting using your vintage U47.

Even if we optimize our mic'ing for the purpose, the sound of the room may still be a problem.

Making a typical room in your house sound good is going to be a challenge for most of us. Take a listen to my podcast episode on Recording In Improvised Spaces to get some ideas for what you could do. I suspect that most people will find the work and expense necessary to make a small room sound acceptable will be far more than what they want to do.

But maybe just eliminating the hard reflections will make enough difference to help. For that, you can just absorb the high frequencies, which, fortunately, are the easiest to control. Any soft material, such a rugs, drapes, blankets, or acoustic tile or foam will soak up the worst of the hard reflections and make a worthwhile difference.

Diffusion, too, can help. A room with a lot of stuff in it, as opposed to an empty room, will sound better. Furniture, bookcases, shelving, boxes, musical instruments, etc. will help diffuse the sound and reduce the distinct echoes in the room.

How many times have you been on a call or in a virtual meeting or presentation and heard distracting noise from one of the participants mics? I've been on calls with people walking on a city street and it was impossible for anyone to hear any of the people speaking. Mute your mic unless you are talking. Always.

Your home may have distracting noises, such as kids, pets, traffic, phones ringing, etc. You should pick a room where you can isolate yourself as much as possible from noise. Actual soundproofing of a room is a complex and expensive endeavor, but listen to my Recording In Improvised Spaces for some suggestions.

You probably can't block out all the noise all the time, but being aware of the noise is the first step towards minimizing it.

One other problem I hear a lot is from people working from home who obviously are speaking very quietly, probably to avoid waking the baby, or interfering with others trying to work at home.

Speaking quietly reduces intelligibility. Couple that with someone in a noisy environment trying to hear you, and the result is a lot of missed information. That could be a big problem if you need to communicate precisely.

The solution is to project your voice. You don't have to shout, or try to emulate a theatre actor trying to be heard in the back row of the hall. I suggest you use the voice you would use if you were in an in-person version of the event. In other words, imagine you are in a conference room with the 15 people you are addressing.

This isn't always an option, but use your voice effectively whenever you can. If what you have to say is important, make sure everyone can hear and understand you.

One easy technique to improve your projection is to stand up. Not great for a long meeting, but at least stand up when you need to be heard.

I find most people in the music business are pretty good at this naturally. But people who don't use their voice this way might benefit from a bit of projection.

And although this is a podcast about audio, I should make a few comments about the video portion of your setup. You might prefer to be a murky figure in the background, but often people get significant cues about what you are talking about by seeing your facial expressions and gestures. If this is important to you, then it makes sense to have your communications room facilitate that non-verbal communications component.

First rule – don't sit in front of a window. Well, maybe that will be OK when it is dark outside. But most video cameras in computers do not have the ability to set exposure. And even if they did, adjusting the exposure so your face is visible will make the intense backlight a solid white. Not a good look.

I think it is better to face the window, so the light illuminates you.

But what if your space is dark to begin with? Or uneven, perhaps from a bright light or window off to the side. Then you will have to use some artificial lighting.

This does not have to be expensive or complicated. You could probably get away with ordinary household lamps if you can get them into the proper position and adjust their intensity by moving them closer or farther away.

I have some nice video lights I use when we are shooting video in the studio, so that is what I use. I have one light with a diffusor off to my left and facing up so that only a bit of the direct light hits me. The rest is reflected off the white ceiling.

I have another light, which has adjustable brightness, over to my right, high up and facing down towards me. I adjust its intensity to provide a nice balance with the light bounced off the ceiling.

And my room, which is actually my control room, has a row of track lights that I can aim for a bit of back-light, which makes me stand out somewhat from the background.

This takes me about ten minutes to set up, and it makes a big difference. I actually leave the lights set up all the time these days.

Also, make sure you like what is in the background. In my case, it is a control room, so it is pretty interesting for an audio crowd. But maybe not always the best for other circumstances. In that case, I keep the background much darker, but turning off some of the room lights.

Some programs give you the ability to put the background out-of-focus, and that might be helpful.

Or you might have the ability to substitute a different photo or even video as your background. That doesn't always work all that well, and some parts of your body may disappear and give you a ghostly look. Probably not what you had in mind.

It looks like we will be using these on-line services for our interaction with people for quite some time, so it is worthwhile to optimize your audio to help you get your message across. And aren't we audio professionals? Why would we tolerate lousy sound to represent us?

Even after the pandemic passes, I think we are going to be doing a lot more of these types of events than we did in the past. Improving your skills will probably be beneficial long-term as well.

So, first thing to do is get rid of the speakerphone.

Next, get a decent headset, or one of the alternatives I suggested.

If you want to get fancy, figure out how to use one of your expensive studio mics. With the proper eq and interfacing, of course.

Fix the lousy acoustics in your room. Or try a different room. Eliminate the echoes and reverberation to the point where they don't affect the intelligibility of your voice.

Minimize the extraneous sounds as much as possible.

Mute your mic when you are not talking.

Project your voice as if you were addressing a live group of people.

And if we want to be professionals, do a little work on your video setup to give you good lighting and eliminate distractions.

You're unlikely to achieve broadcast quality audio and video without spending a lot of money, but you can achieve 90% of that quality with a little work and very little money.

This is My Take On Music Recording. I'm Doug Fearn. See you next time.