

TECH SETUP GUIDE

Welcome to this bonus guide to “tech” for the Daily Virtuoso!

When I first created this guide in 2020, we were all getting used to online learning and spending all of our time in zoom meetings and video calls.

Now, asynchronous online learning is a cornerstone of how many creators deliver content to you, and how I continue to do so both inside and outside of the Daily Virtuoso.

[You can watch the video](#) for a little trip down memory lane and a tour into my garage studio. Therein you can see how I make the videos you watch every week, and hopefully gain some inspiration for how you could create your own video content.

It is also my goal to demystify the tech side of things and enable you to create video content, whether you have a “fancy” garage studio or not!

Therefore, this guide will focus on how you can make your best-looking and sounding recordings right now. I’ll focus on helping you use the equipment you already have, although I’ll suggest additions for those of you who are interested.

BE SEEN AND BE HEARD

The basic requirements for any music video are that viewers can **see** the performer(s) and **hear** the music. Now, some music videos get so “creative” that the performers never actually appear on screen! But I’ll assume you’re not interested in making a video like that.

As long as your viewers can see you (you’re safely in the frame and have enough “good” light on you) and hear you (your playing is louder than any competing sounds) you’re well on your way to having a great video.

From there, you can make improvements as far as you desire: choosing a better background; more desirable lighting; higher quality video and audio capture. But all of these are far less important than the basics of being seen and heard.

WHAT I USE

Since I make a lot of videos, both pre-recorded and live-streamed, I have invested in a lot of equipment over the years. Let me stress that none of this equipment is necessary for you to make high-quality video. Most of it simply allows me to get a certain look or sound, and to be able to do so day after day without fear of equipment failure.

But I am often asked what I use, so let me break down my equipment and process for you here.

For videos that I make in my garage studio (approximately 18 feet long x 9 feet wide x 8 feet high):

I sit about 6 feet in front of a green fabric screen that I have stretched to cover the entire back wall of the garage. This acts as a dark, neutral background most of the time. However, I can flip a switch to turn on two green Bladelights (LED) to enable a chromakey (green screen) effect if I want to replace my background with something more fun.

I light myself with two fluorescent fixtures by Limostudio, each about four feet in front of me and one foot above me (on lighting stands). One is 30 degrees to my left, the other 30 degrees to my right. The one to my left is turned to 3 times the power of the one to my right. That's because I like a bit of shadow rather than a totally "flat" appearance. In addition, I sometimes shine a strong light down onto the back of my head and shoulders (a strip light from Westcott), from the top of the back wall. This is what's called a "rim" light and helps separate me from my background.

Because my garage is small, reflective, and full of right angles, the sound would be intolerable if left untreated. Therefore, I have eliminated most reflections by covering much of the walls and ceiling with "egg crate" foam. I also mic myself more closely than I might in a larger room.

The microphones I use vary depending on how much I will alternate speaking with playing. When I will do a lot of speaking in addition to playing, I tend to use a "lavalier" microphone. These are tiny mics that are often clipped onto a shirt lapel or taped to the side of an actor's head. My lavalier mic is a DPA 4061, and I clip it to the front of my shirt so that I get almost all "direct" rather than reflected sound from the walls, floor, etc.

My microphone needs power, so I plug it (using an XLR cable) into a channel strip by Universal Audio (610 mark II) that gives it “phantom power” and also provides compression. This tones down the loudest sounds (which would be loud playing) so that they’re not so much louder than my speaking.

If I am recording a primarily playing video, such as a performance, I usually choose to use a mic that’s further away, though still only three feet in front of me and two feet above me. I use a DPA 4011A. This gives the violin sound a little more room to “breathe”.

My camera (a Blackmagic Ursa Mini Pro) includes full-sized XLR audio inputs, so I am able to plug that channel strip directly into the camera. This means that I don’t have to sync my audio and video later on.

For videos that I record elsewhere:

I use a smaller camera (Blackmagic Pocket Cinema Camera 6K) that I can place on a tripod. This camera includes a mini-XLR input, so I could use an adapter cable to plug in a full-sized XLR cable. I will either do that, or simply record “scratch” audio with the camera while recording higher-quality audio onto my digital recorder, a Sound Devices 833. Having audio from the camera as well as the separate high-quality track makes it very easy to synchronize the audio and video in software later on. I use DaVinci Resolve.

VIDEO AND AUDIO: do they always go together?

Imagine a dream recording scenario: you have 24/7 access to a gorgeous concert hall! You could then condense this entire guide down to one sentence: stick your phone on a stand out in the hall, turn it on, and press record. You’d get a great looking and sounding video! If only life worked that way.

In the real world, in most rooms, the best place for the picture may not be the best place for the sound. Home recording therefore means making a series of choices and compromises based on your budget, your time and energy, and your comfort with equipment.

If you read the previous section, detailing what equipment I use, you’ll see that I never use the plain on-camera audio. Either I will plug professional equipment into the XLR input of my camera, or I will record audio onto a separate digital recorder.

However, if you're relatively new to recording videos, I'd love for you to keep things simple. You may not own a concert hall, but that shouldn't stop you from using the "phone on a stand" approach!

Your best camera is probably a smartphone that you already own, and it has a microphone. It may not be the best microphone, but it will always be in sync with its camera. If you set its level manually (detailed below) you may be surprised at the quality you get right in your own home.

To instantly improve your in-phone audio, you might consider a microphone that plugs right into it. For the iPhone, my favorite option is the Shure MV-88, a small but high-quality condenser mic that plugs right into the lightning port. Similar options exist for other phone models. If you use such a microphone, you'll want to make sure it is being used for the audio in whatever app you use for recording (detailed below).

Recording your audio separately simply gives you more flexibility and control, at the cost of extra equipment and the extra step of syncing the audio using your video editing software. When you take your audio "off camera", so to speak, you are able to put your microphones anywhere in the room. In most rooms, that will mean closer to the source (you, the performer).

But again, I would encourage you to keep things simple and to look for that compromise: a room that sounds good (we'll get more into that later) and a place in that room that gives a good view of you and a good sound as well. If you run out of compromises to make, that's when you turn to more equipment!

VIDEO IS EASY

That's right: using a smartphone camera, it's easy to capture high quality video. You just need something to hold the camera, and light to make you look good.

Does it surprise you that you don't need an expensive camera to make a great-looking video? Let's look at the reasons expensive video cameras cost so much, and why these reasons likely don't matter to you.

The ability to use pro lenses

Directors need many different lenses to get just the shots they want, so their cameras need to be able to accept those fancy lenses. While that flexibility would be nice, you'll just be moving your camera instead.

Ultra-high resolution

Even smartphones can shoot in HD these days, and that's more than enough for a great-looking video. Pro cameras shoot ultra-high resolutions so that the big-budget projects they capture will be ready for any audience on any size screen.

Pro usability

Big-budget projects can't risk downtime due to malfunctioning equipment. Pro cameras are built to handle moisture, heat, cold, sand, you name it. You won't need to worry about any of that (please don't shoot your video on the beach; think of the varnish)! In addition, big-budget projects use manual focus. There's a guy whose job it is just to pull focus all day long. Therefore pro cameras include manual focus knobs that are easy to "mark" for focal distance. If you've ever heard of an actress hitting her "mark", it means she moved to the right spot at the right time for the focus puller. You won't be moving (much), and just about any camera can detect your face and focus automatically.

So if the previous features are things you *don't* need, *what do you need for your videos?*

Camera support

The camera shouldn't move. At all. Either prop it up against something or, better yet, get a cheap stand or clamp for it. For my iPhone, I use the Stage Ninja and I can clamp it onto anything!

Battery power

One last note about cameras: whenever possible, run on battery power and bring spare batteries. If you're using your phone as your camera, this is likely a given. AC power lines carry noise, which will find its way onto your recording sooner or later. Power lines are also susceptible to outages and power spikes. For example, if you're on AC and someone turns on a light somewhere else on the same circuit, your video may dim momentarily.

A sensible background

You don't need my green screen, or a high-school prom background. Just make sure that what's in the frame other than you looks agreeable enough. Simple and uncluttered is best. So tidy up, and look for reflective surfaces (such as mirrors) that may reveal parts of your house you didn't expect!

Relativity of light

This sounds like an Einstein theory, but it's a lot simpler: out of everything in the frame, the best-lit thing should be you. As long as you make that happen, your camera will automatically adjust its exposure appropriately.

Just to reiterate: because your camera is almost certainly set up to auto-expose, it's not about **how much** light is on you. It's about the ratios. How much light is on you *relative to the background*? How much light is on the lit-up parts of you *relative to the darker parts*?

That's why you want to watch for these two common mistakes:

Backlighting

If you have a strong light source behind you, your camera will almost certainly be fooled and will "expose" for the lit-up background. Therefore you will show up dark on your video. You don't want that. Position yourself so that the strongest light sources are shining on your front, your side, or some combination of the two.

Overhead light

In some rooms, the only light comes from directly overhead. That may look fine to our eyes, since they're used to making adjustments and compensating for shadows. But if the lights are strong enough and narrow enough (like spotlights), those shadows get pretty harsh. And on video, you'll end up with dark shadows under your eyes and chin.

This isn't as big a deal as total backlighting, but it's still something to avoid when possible. If you're stuck with overhead lighting and a dark floor, you may consider putting a large piece of white paper, aluminum foil, or another reflector on the floor below you. Just make sure that reflector doesn't appear in the shot!

AUDIO: choices and compromises

Just as lighting for video is about ratios, so is audio. The best-sounding recordings contain tons of signal (the music) and very little “noise”. A high signal-to-noise ratio. The actual volume is something you can adjust in your video-editing software. But that ratio is set when you make your recording.

Another ratio that’s set at the time of recording is the ratio of “direct” to “reflected” sound. Direct sound goes right from the source to your ear (or the microphone). Reflected sound, of course, hits another surface first, then hits the microphone later.

Now some reflected sound is beautiful. Inside Disney Hall, where I perform with the LA Philharmonic, audience members bathe in the reflected sound of our orchestra. But if you read about my tiny garage, you know that when I record in there, I want to get rid of as many of those reflections as possible!

Again, in the interest of keeping things simple, I encourage you to pick a room that has at least a decent sound. That way, you can record audio straight into your phone or camera, using its built-in microphone or (even better) an accessory mic.

If I didn’t have fancy equipment, I simply wouldn’t bother recording in my garage. It would be a waste of effort.

ROOM TYPES

The basic idea is this: the better your room sounds, the more flexibility you have with your microphone placement. That’s it in a nutshell, whether your microphone(s) are attached to your camera or separate.

As I mentioned before, If you were recording in a concert hall, you could put a single microphone in the middle of the hall, far away from you, and call it a day. That’s because the hall is designed to sound great where the audience sits.

Recording in a parking garage instead? Try putting a mic 30 feet away and all you will hear are reflections: echoes of echoes. Recording space and microphone placement go hand in hand.

Look around your home for a room that’s large enough to let the sound breathe, if you have such a room. If you’re lucky, it won’t be comprised of all right angles, and it may also

have some sound absorption in the form of furniture, curtains, wall decorations, etc. Carpet isn't necessary, as most recordings are made on hard floors and our ears are used to those reflections.

A "too dead" space is far preferable to one that's "too live". That's because if you have to, you can add reverb. But you can't take it away. That's why, in the end, I can record in my deadened garage using close mic-ing.

MICROPHONE TYPES AND PATTERNS

This will be an abbreviated look at the main microphone types and some tips for placement. Rest assured that you can find shelves of books on this topic if you're interested in going deeper! But this should give you an idea of what's possible.

There are three main types of microphones: condenser, dynamic, and ribbon. We're only going to be talking about the first of these. Just know that the others are out there, and have their uses! But the microphone in your smartphone is likely a condenser, as are any of the external microphones we'll be talking about.

Every condenser mic picks up sound in a "pattern". Some mics can even switch patterns depending on your preference! The main patterns are cardioid, omni, and figure-8.

Cardioid is so named because the shape of the pickup pattern resembles a heart. Sound coming from directly in front of the capsule registers the loudest, and as you move away from the center point, the microphone picks up less and less. Sound from behind the microphone is hardly picked up at all.

An exaggerated version of cardioid, called hypercardioid, is often used by "boom" operators on movie sets, who need to pick up the sound of one actor speaking... and no other sounds.

An **omni-directional** patterned mic, or omni, does exactly what you might guess: it picks up sound coming from all directions equally.

A bi-directional, or **figure-8** pattern, mimics human hearing to a certain extent, because it picks up sound from the front of the capsule and the back, but not the sides. This pattern is almost never used on its own, but in combination with other microphones to provide a blend.

COMMON MIC PLACEMENTS AND SETUPS

String instruments sound their best when they can “breathe”: that is, when their sound is allowed to travel through some air before hitting the listener’s ears or a microphone capsule. Do you like the sound under your ear as much as that of your favorite recorded soloist? It’s not just because you don’t think you play as well as them! It’s because you’re hearing yourself from six inches away.

But sometimes, six inches away is the only place in the room where the sound is acceptable. You’ve heard plenty about my garage, but it bears repeating: my best mic placement in there is very close to the instrument, because otherwise I pick up harsh reflections.

The better your room, the further away you can afford to place your microphone(s). Now even in a concert hall, engineers will also place some mics close to the performers, sometimes very close indeed. But they can still make great use of the so-called “room mics”: the ones that capture the glorious reflected sound of the space.

Obviously using more than one microphone placement introduces complexity, more than is feasible to explore in this guide. But if you have the means and the capability, it’s best to capture sound both close and far, then blend the two for a pleasing mixture.

I have already mentioned the clip-on lavalier microphone, which for our purposes should be an omni pattern. That’s because at such a close distance, it would be too difficult to ensure an accurate placement for a cardioid-pattern mic. This is best in a small, unflattering room. You might consider adding a bit of reverb when recording with this setup, but always go easy when doing so.

Slightly further out, you might place a cardioid mic 2-4 feet away from the instrument, pointing down at a 30-45 degree angle. This gives a little breathing room, while still eliminating most other sounds in the room. You’ll pick up a little reflection from the floor this way, which may help give a sense of space. In this setup, you may also consider adding a touch of reverb.

If your room sounds good, you can also try a cardioid further out: 6-10 feet or even more. Unless your recording space is exceptionally quiet, however, you will start to pick up other sounds more since your recording levels (discussed below) will need to be higher at this

greater distance. Things like street noise, refrigerators, fans, HVAC, will appear to be more prominent when recording at this distance.

And, as long as you have a good-sounding room, you might try an omni patterned mic instead of, or in addition to, your cardioid. Many large-diaphragm condensers, for example, will allow you to switch patterns (cardioid, omni, figure-8) using, well, a switch!

SETTING LEVELS

Whether recording to a digital recorder, directly into your camera, or directly into your phone, you'll want to make a test recording to see that your audio is working correctly. Of particular importance is the recording "level": how high or low does your recording device record your signal?

For your videos, you will want to make sure that your device is set to "manual" level, rather than automatic. On a phone, this means that you'll want to use a recording app, since the native video recorder will change the levels automatically. This means that it will attempt to make your quiet playing louder, and vice versa. You don't want that.

My favorite app for the iPhone is called Filmic Pro, and it will allow you to set your microphone's level, or gain, manually. Start at 50%, place the recorder (and yourself) in position, make a test recording with some loud playing, and see where the loudest volume "peaks" lie. Ideally, they're somewhere between -12 and -18 dB.

You want that "headroom" between -12 and 0 because if you reach 0, the signal will "clip". It will be unusable. You really don't want that. So stay away from 0!

AUDIO PROCESSING: post-production

This is another topic worthy of its own bookshelf, but in general, you don't want to do much post-processing. Get it close while you record, and you should only need a tweak or two to get it right.

The most common tasks I perform after recording are syncing my high-quality audio track to the video (if I didn't record directly into camera), normalizing, noise reduction, and reverb.

Normalizing refers to boosting the overall level of the audio so that the highest peaks reach much closer to 0. Basically, in recording, you keep those peaks far away from 0. In post, you raise the level of everything so that the peaks are around -3.

If I missed a source of background noise during recording, I will sometimes use noise reduction. Like reverb, this must be subtle so that it doesn't start reducing the audio I actually want to keep! But if there was a refrigerator nearby, or the steady hum of an air conditioner, a bit of light noise reduction will sometimes make the track more usable. For this reason, you always want to make sure and record 10-30 seconds of "room tone" before calling it quits on a recording session. You'll want that background noise to feed to your software so that it can remove it from your recording.

Reverb must be subtle to sound at all natural. Nothing ruins a great home recording faster than canned reverb! Start with nothing, and if you can't stand it, then add a touch at a time until you like what you hear. Then back away one touch!

WRAPPING UP

Again, my hope is that you'll keep things simple so that you can focus on what's important: your playing and the fact that you'd like to have a record of it!

Ideally, you will:

- Use your smartphone as your recording device
- Support it with a stand, tripod, or clamp
- Record using an app like Filmic Pro
- Set manual levels for the built-in mic or accessory mic
- Find a good-sounding room
- Find a spot in that room with enough light on you
- Check your frame for background and reflective surfaces
- Experiment with placement for your recorder
- Make a test, then watch and listen
- Make Take 1

Remember that in the end, what you want is to be **seen and heard**. It's as simple as that!