Why Is Your Drone Footage Choppy? (5 Ways to Fix)

You've just finished piloting your drone for the day and you feel like the flights couldn't have gone smoother. The actual footage, however, suggests otherwise. It's noticeably blurry and only features flickering visuals.

If that's the case, you've ended up with choppy drone footage. Now, identifying it was the easy part — let's take a look at what exactly makes your footage choppy.

Your drone footage may be choppy due to issues with the live feed or unsuitable settings. These settings mainly refer to the shutter speed and the rendering options. Sometimes, however, the footage only seems to be choppy. In such a case, the issue lies within the equipment being used to view it.

Troubleshooting the recordings might seem a little scary since it's not something drone pilots are tasked with often. My job though, is to make this process as simple as possible.

In this post, I'll be discussing the most common reasons and the steps you can take to maximize your drone camera's potential.

Why does drone footage look choppy?

Before we get to the fixes, let's dive deeper into the specifics of choppy drone footage.

Drone footage can look choppy due to a weak communication signal, careless panning, bad firmware, frame rate issues, or incorrect shutter speed and aperture settings. In other cases, the choppiness might be noticeable in the exported file but have nothing to do with the recording itself.

Notice how I didn't mention a "slow" SD card. It's a common misconception that slower SD cards can degrade drone footage when, in fact, they can only result in an abruptly stopped recording.

Here's how these causes can end up influencing your drone footage.

Transmission Loss

This part refers to the drone footage that is being played in real time and *not* the file that is stored in the drone's SD card.

If the live feed isn't as smooth as you'd expect, the data transmission of the video is being interrupted. And as a result, parts of the video never make it to your device.

The good news is that this doesn't affect the actual recording. However, heavy transmission loss can definitely be annoying to put up with.

The main sources of disruption are power lines, large buildings, or general crowdedness. Alternatively, your drone might just be out of range.

There's obviously a bit more to a drone's signal and its range. If the topic particularly interests you, find out more about it in this article.

Poor Piloting

If you're still getting the hang of taking drone shots, your inexperience might be the reason why your footage lacks that little bit of quality.

It's important to know exactly how sensitive the controls are to ensure smooth piloting. When you start recording without warming up, for example, you'll notice yourself making jerky movements.

These fast camera pans result in choppy drone footage — especially if you're shooting cinematic videos.

Once you do have enough practice under your belt, you'll naturally manage a smoother and steadier flight.

Outdated Firmware

This one may not be the most likely cause but it's definitely the easiest to tick off.

A drone becomes more susceptible to errors as technology progresses. To keep its performance in check, its firmware is regularly updated.

If your drone (or its app) is functioning on outdated firmware, it might be struggling to apply your instructions. And consequently, you receive a drone video that's relatively low in quality.

Frame Rate Mismatch

When talking about choppy drone footage, this cause tops the probability chart.

A frame rate mismatch may happen *as* you edit to touch up the footage.

Let's look at an example. If you shot your video at 24fps and imported it into an editor set to 30fps, the frame rate mismatch would've caused a *somewhat* noticeable stutter in the footage.

The settings for the drone and the editor need to complement each other, which only happens when both of them are set to the same frame rate.

This YouTube video goes a bit deeper on this topic by displaying a side-by-side comparison.

https://www.youtube.com/watch?v=__f8GWk7YyI

Unsuitable Camera Settings

If the cause has nothing to do with the editing process, you might be using the wrong camera settings.

First off: the shutter speed. Faster shutter speed creates sharper images, while slower shutter speed causes more motion blur.

Now, what does this mean for you?

If you're noticing choppiness in your footage, your shutter speed may be a bit *too* fast. The lack of motion blur enhances every frame, which takes away the element of smooth transitions.

The aperture settings also play a role in the overall quality. In fact, they're used *with* the shutter speed settings to create a balance. If the aperture is off relative to the light conditions, the quality will ultimately suffer.

Why is your drone footage exporting choppy?

I've mentioned the causes for a video that's choppy before or during the editing process. But what if everything's fine *until* you export the final footage?

Your drone footage may be exporting choppy because your computer doesn't have the processing power to play the video without buffering. This is particularly common with high-quality recordings. Alternatively, you may be using an incompatible computer screen or video player.

There are different ways to extract a video, but your computer may not always have the capability to support the one you use.

From these reasons, it's evident the problem must not be lying within the footage itself but the equipment or platform being used to support it.

Here's what you can do about a video exporting choppy:

- Upgrade your computer or change the video codec.
- Use a different monitor or upload the video to the cloud to view it from a different device.
- Play the video on different media players.

How do you smooth out your drone footage?

We've talked about all the reasons why your drone footage may be choppy, but you still might be looking for actionable advice. Here are some tips that will *actually* level up your cinematography, especially if you're a beginner.

You can smooth out your drone footage by setting the shutter speed twice the frame rate with the help of ND filters. At the same time, you may want to turn off video caching, lower the joystick sensitivity, and upgrade your computer to avoid issues with the exported file.

Let's expand on some of the points I've made above, so you know exactly how to implement them.

Set the Right Frame Rate

We know that we need to avoid a frame rate mismatch, but what frame rate is really the "right" one?

Here's the thing: it purely depends on the type of content you're shooting.

If you want your footage to have that extra-smooth, cinematic feel, I recommend using 24fps. It's the industry standard. Otherwise, you can't really go wrong with 30fps since it's generally used the most often.

When shooting slow-motion videos though, you might want to switch over to 60fps.

The right setting will ensure the frame rate goes hand in hand with the drone's operation, resulting in a smooth recording. You should be able to find the setting for your frame rate on the drone's app.

https://www.youtube.com/watch?v=CHYheb5sEHw

Use ND Filters

This part is *crucial* if you're shooting on a super sunny day with a fast shutter speed.

ND filters attach to the camera lens and reduce the amount of entering light. And as a result, you're able to slow down the shutter speed to create the right amount of motion blur.

This accessory is particularly useful if your drone doesn't have manual aperture control to make up for harsh lighting.

The filters are also really easy to attach and using them is a sure-fire way of getting rid of choppiness.

Follow the 180 Degree Rule

I've stressed the importance of using a slow shutter speed a fair amount of times now, but you still might be wondering what exactly to set it to you.

Here's the idea. Once you settle on a frame rate, simply use double the shutter speed. So, if you're using a frame rate of 24, use 48 or 50 as the shutter speed.

This is commonly known as the 180 shutter rule. It's used to mimic what the eye sees — hence achieving *natural* motion blur.

https://www.youtube.com/watch?v=qZHXTZvQdzI

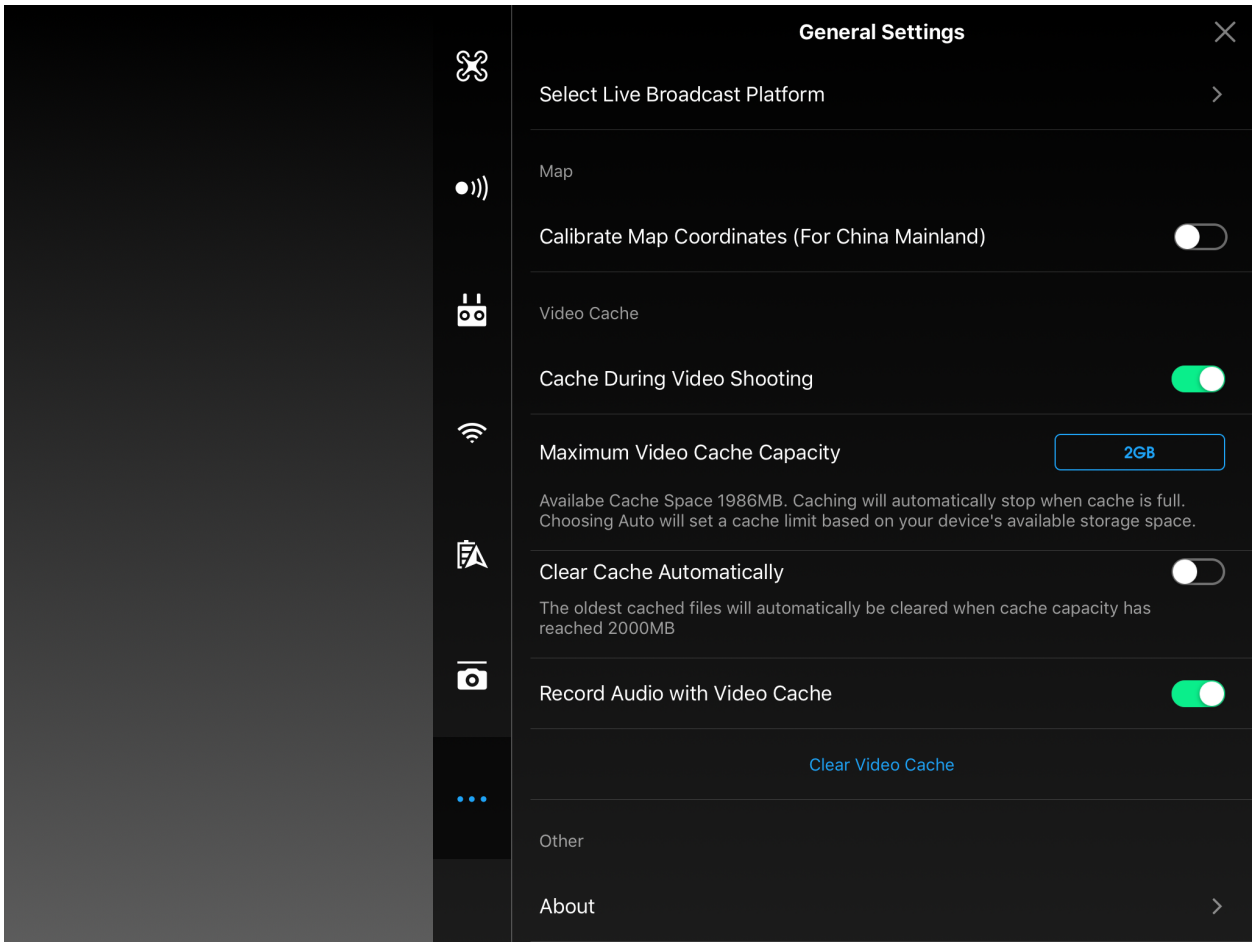
Turn Off Video Caching

This tip might help smooth out the live feed of your drone footage.

Video caching is generally turned on in the drone's app by default, but it can have a negative effect on devices with less usable memory.

In turn, there's no free RAM for the live feed itself. This can disrupt the real-time video and significantly lower its quality.

I recommend experimenting with the setting to figure out if it's worth switching permanently.



Switch Up the Sensitivity

I've mentioned how slow movements and smooth camera pans are essential for eliminating choppiness. And a simple way to achieve those things is by adjusting the joystick's sensitivity until it simply feels right.

If your drone has multiple shooting modes, you can try using cinematic mode. This will automatically lower sensitivity levels to ensure a smoother recording.

DJI drones come with several sensitivity settings, which can get a bit overwhelming to configure. This YouTube video does a good job explaining what each one means.

https://www.youtube.com/watch?v=6kfuJxF3PUM

How do you stabilize FPV drone footage?

An unstable drone will obviously record choppy footage. And unfortunately, FPV drones often vibrate a bit too much. Here's how you can stabilize their footage.

You can stabilize FPV drone footage by digitally stabilizing the GoPro recording through Reelsteady GO. It turns shaky footage into a smooth video in minutes. It's also important the drone has a balanced build and uses the right settings to ensure the footage is always salvageable at the very least.

I've recently done an article on how to build an FPV drone, which may help you put a well-balanced one together.

It's important to note that Reelsteady *only* works with GoPro cameras, since it uses their gyro data to stabilize the video.

Plus, the extra control that Reelsteady offers can get a bit tricky. This tutorial offers an in-depth explanation of its use.

https://www.youtube.com/watch?v=YtahzPQRB9M

Why is your Mavic 2 Pro video choppy?

The Mavic 2 Pro is known as one of the best consumer drones for filming videos. That's why it's *really* disappointing when its footage occasionally turns out to be choppy.

But don't worry, I've done the research to figure out what the most common causes are for the Mavic 2 Pro in particular.

Your Mavic 2 Pro video may be choppy because of its camera settings. For most pilots, the likely cause is not following the 180 degree rule and choosing the incorrect shutter speed for the type of content being shot. Alternatively, your computer might be struggling to process the video codec.

As I've mentioned before, you can always change the video codec so it's easier for your computer to read. You'll specifically be converting H.265 to H.264.

The video shows an incredibly simple way of doing exactly that.

https://www.youtube.com/watch?v=rIJtUP8vABQ

Why is your Mavic Mini 2 video choppy?

The Mavic Mini 2 is the more budget-friendly option from DJI and it manages to hold its own while shooting cinematic videos. You may, however, notice video choppiness from time to time.

Your Mavic Mini 2 video may be choppy because of fast camera pans. This is because the Mavic Mini comes with a more limited camera sensor as compared to the Mavic Pro. Two other commonly reported causes are the video caching option turned on and a faulty gimbal.

So, it's best to keep the drone's movements as subtle as possible.

And if you do notice a faulty gimbal upon inspection, I suggest sending your drone out for a quick repair.

How can you make a good drone video?

So, you've implemented all the tips to smooth out your footage as much as possible. Does this mean you have what it takes to make a *good* drone video?

Here's the deal. Smooth production lays down a solid foundation, but there's a lot more to putting together a video. Here are some things to keep in mind before I wrap this up.

You can make a good drone video by using your creativity and ensuring your technical skills are on point. Do not shy away from additional equipment. Key points include experimenting, shooting at "golden hour", flying closer to objects, and using the power of editing to your complete advantage.

You may find your own process as you continue to fly drones, but it's important your final cuts genuinely offer a unique perspective.

https://www.youtube.com/watch?v=oJcYiBYTzA0

Conclusion - how do you stop choppy drone footage?

To wrap it all up, there are no hard and fast rules about stopping choppy footage — you'll always have to experiment.

You can stop choppy drone footage by inspecting your flights and their results to identify the exact cause(s). This may include an issue with the frame rate or with the piloting itself. You can then apply a suitable fix and take extra measures, like using ND filters, to smooth out the footage.

As you continue your journey in shooting top-tier aerial footage, it's important to stay safe during the missions. Make sure you *actually* know what you're doing before unnecessarily risking the drone itself.